This page intentionally blank.
TABLE OF CONTENTS

TABLE OF CONTENTS ........................................................................................................... 3
LIST OF TABLES ...................................................................................................................... 4
LIST OF FIGURES ..................................................................................................................... 5
ITINERARY AND CONTACT PERSONS .................................................................................... 6
PREFACE .................................................................................................................................... 6
CHARGE TO THE 2020 EXTERNAL REVIEW TEAM ............................................................. 7
EXECUTIVE SUMMARY OF THE SELF-STUDY REPORT ...................................................... 7

1. INTRODUCTION .................................................................................................................. 9
   1.1 BRIEF DEGREE PROGRAM HISTORY ........................................................................... 9
   1.2 MISSION, STRATEGIC PLAN, GOALS ........................................................................... 11
   1.3 ANALYSIS OF GRADUATE PROGRAM ........................................................................ 13
   1.4 SUMMARY OF LAST APR EXTERNAL REVIEW (2013) .................................................. 14

2. STRUCTURE OF MECHANICAL ENGINEERING DEPARTMENT ......................................... 17
   2.1 ADMINISTRATIVE ORGANIZATION ............................................................................. 17
   2.2 THE FACULTY .............................................................................................................. 18
   2.3 INDUSTRY ADVISORY COUNCIL .................................................................................. 25

3. MECHANICAL ENGINEERING GRADUATE PROGRAM ...................................................... 27
   3.1 OFFICE OF GRADUATE AND PROFESSIONAL STUDIES .............................................. 27
   3.2 GRADUATE DEGREES ................................................................................................... 28
   3.3 GRADUATE COURSES .................................................................................................. 32
   3.4 GRADUATE ADMISSION ............................................................................................... 35
   3.5 GRADUATE STUDENT ENROLLMENT ........................................................................... 39
   3.6 MECHANICAL ENGINEERING GRADUATE DEGREE STATISTICS ............................... 45
   3.7 ASSESSMENT OF STUDENT LEARNING OUTCOMES .................................................. 50
   3.8 SUMMARY OF ACADEMIC ENHANCEMENTS ............................................................. 50

4. RESEARCH IN MECHANICAL ENGINEERING .................................................................... 54
   4.1 RESEARCH AREAS ....................................................................................................... 58
   4.2 RESEARCH CENTERS .................................................................................................. 60

5. ASSESSMENT OF THE GRADUATE PROGRAM ................................................................ 64
   5.1 STATE OF THE DEPARTMENT AND ROLE IN THE UNIVERSITY MISSION ................... 64
   5.2 PEER GROUP ASSESSMENT .......................................................................................... 64
   5.3 STRENGTHS, WEAKNESSES, OPPORTUNITIES, AND THREATS (SWOT) ................. 71

6. THE FUTURE OF THE DEPARTMENT ................................................................................. 73

APPENDIX A. FACULTY BIOSKETCHES ................................................................................. 75
APPENDIX B. GRADUATE SEMINAR SPEAKERS .................................................................... 289
APPENDIX C. PH.D. EXAMINATIONS .................................................................................... 303
APPENDIX D. SYLLABI OF MECHANICAL ENGINEERING COURSES ................................ 308
APPENDIX E. MULTI-YEAR COST-SHARING FUNDING PACKAGES .................................... 396
APPENDIX F. GRADUATE STUDENT ASSESSMENT .............................................................. 400
APPENDIX G. INSTITUTIONAL PROFILE ............................................................................... 409
<table>
<thead>
<tr>
<th>Table</th>
<th>Description</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>History of Mechanical Engineering Department Heads</td>
<td>10</td>
</tr>
<tr>
<td>2</td>
<td>List of mechanical engineering staff members</td>
<td>17</td>
</tr>
<tr>
<td>3</td>
<td>List of mechanical engineering faculty members</td>
<td>19</td>
</tr>
<tr>
<td>4</td>
<td>Endowed positions in mechanical engineering</td>
<td>24</td>
</tr>
<tr>
<td>5</td>
<td>Mechanical Engineering research expenditures (MAESTRO, January 30, 2020)</td>
<td>25</td>
</tr>
<tr>
<td>6</td>
<td>Count and average of T/TT faculty journal publications</td>
<td>25</td>
</tr>
<tr>
<td>7</td>
<td>List of Industry Advisory Council members and their industry affiliations</td>
<td>25</td>
</tr>
<tr>
<td>8</td>
<td>Degree Requirements for the M.Eng. Program</td>
<td>28</td>
</tr>
<tr>
<td>9</td>
<td>Degree Requirements for the M.S. Program</td>
<td>29</td>
</tr>
<tr>
<td>10</td>
<td>Degree Requirements for the Ph.D. Program for Students Entering with a Bachelor’s Degree</td>
<td>30</td>
</tr>
<tr>
<td>11</td>
<td>Degree Requirements for the Ph.D. Program for Students Entering with a Master’s Degree</td>
<td>31</td>
</tr>
<tr>
<td>12</td>
<td>Special Topics Courses from 2013-2019</td>
<td>34</td>
</tr>
<tr>
<td>13</td>
<td>Retention and graduation rates of master’s students in mechanical engineering</td>
<td>46</td>
</tr>
<tr>
<td>14</td>
<td>Retention and graduation rates of Ph.D. students in mechanical engineering</td>
<td>46</td>
</tr>
<tr>
<td>15</td>
<td>Number of graduate teaching fellows in mechanical engineering each year</td>
<td>53</td>
</tr>
<tr>
<td>16</td>
<td>Research Cluster Matrix</td>
<td>54</td>
</tr>
<tr>
<td>17</td>
<td>USNWR and Shanghai rankings of the mechanical engineering departments at Texas A&amp;M and peer institutions.</td>
<td>65</td>
</tr>
</tbody>
</table>
LIST OF FIGURES

Figure 1. Number of core T/TT and APT faculty: full, associate, assistant, and APT ........................................... 22
Figure 2. Percent of T/TT female faculty in the mechanical engineering department ........................................... 23
Figure 3. Ethnicity of T/TT faculty as of fall 2019 .......................................................................................... 23
Figure 4. Historical number of applications received, students admitted, and students enrolled .................... 37
Figure 5. Historical rate of graduate admission ................................................................................................. 37
Figure 6. Historical rate of student matriculation ............................................................................................ 38
Figure 7. Historical rate of Ph.D. student application, admittance, and enrollment ........................................ 38
Figure 8. Historical rate of master student application, admittance, and enrollment ...................................... 39
Figure 9. Mechanical engineering master’s degree enrollment by degree type ............................................... 40
Figure 10. Mechanical engineering graduate enrollment by degree level ....................................................... 40
Figure 11. Number of underrepresented minority students enrolled in the mechanical engineering graduate program ........................................................................................................ 41
Figure 12. Underrepresented minority enrollment in percentage ..................................................................... 42
Figure 13. Female student enrollment in the ME graduate program at TAMU through the years ...................... 42
Figure 14. Female student enrollment in percentage ......................................................................................... 43
Figure 15. Domestic and international student enrollment in master’s program (M.S. and M.Eng.) .................. 44
Figure 16. Domestic and international student enrollment in Ph.D. program .................................................. 44
Figure 17. Percent domestic and international student enrollment in graduate program (Ph.D. and masters) ... 45
Figure 18. Graduate degrees awarded 2013-2019 ......................................................................................... 47
Figure 19. Graduate degree awarded for female students .................................................................................. 48
Figure 20. Mechanical engineering degrees awarded to underrepresented minority students ..................... 48
Figure 21. Percentage of mechanical engineering degrees awarded to international students ...................... 49
Figure 22. Average time to degree 2013-2019 ................................................................................................. 50
Figure 23. Heat plot of self-selected faculty research areas .............................................................................. 57
Figure 24. USNWR ranking of the J. Mike Walker Department of Mechanical Engineering, 2013-2019 ......... 65
Figure 25. Number of faculty by rank at Texas A&M and peer mechanical engineering departments .......... 66
Figure 26. Total graduate student enrollments of Texas A&M and peer mechanical engineering departments . 67
Figure 27. Number of total graduate students per tenure track faculty (TTF) at Texas A&M and peer mechanical engineering departments .................................................... 68
Figure 28. Number of Ph.D. students per tenure track faculty (TTF) at Texas A&M and peer mechanical engineering departments ........................................................................................................ 68
Figure 29. External research funding of Texas A&M and peer mechanical engineering departments from ASEE ............................................................................................................................................. 69
Figure 30. Academic Analytics productivity radar for mechanical engineering at Texas A&M ...................... 70
Figure 31. Scholarly Research Index (SRI) from Academic Analytics for Texas A&M and peer mechanical engineering departments ........................................................................................................ 71
Figure 32. Mechanical engineering endowment funds .................................................................................... 72
ITINERARY AND CONTACT PERSONS

J. Mike Walker ’66 Department of Mechanical Engineering
Academic Program Review Itinerary (forthcoming)
March 2020

Dr. Ana Muliana, APR Committee Chair (amuliana@tamu.edu)
Ms. Rebecca Simon, Academic Advisor (rebeccasimon@tamu.edu)

PREFACE

Mechanical engineering research and education at the graduate level encompasses a broad pallet of specialties and applications, ranging from traditional thermal-fluids, dynamics and controls, mechanical systems, and design to emerging and multidisciplinary topics in materials science, nanoscience, artificial intelligence, autonomous vehicles, biomechanics, human-robot interaction, manufacturing, and renewable energy. The J. Mike Walker ’66 Department of Mechanical Engineering at Texas A&M University is active in all aspects of mechanical engineering research and education and is one of the largest, most diverse departments in the United States.

Over the past six years, the J. Mike Walker ’66 Department of Mechanical Engineering has grown and enhanced its graduate program in several important ways. Several junior, research-focused faculty members as well as members of the National Academy of Engineering have been added to the department. The increased quality of our program is reflected in its continued high ranking amongst peer institutions since 2013 and in a number of other metrics involving diversity, the number of Ph.D. degrees granted, and the number of student applications. As we strive to further improve our graduate program, the peer assessment process becomes increasingly important.

In this self-study, we provide a glimpse into the breadth, quality, and diversity of the graduate program in the J. Mike Walker ’66 Department of Mechanical Engineering at Texas A&M. The data included in this report is provided by the Texas A&M University Division of Enrollment & Academic Services’ Data and Research Services office, unless otherwise noted.

We thank you for your time in reviewing and assessing our graduate program, and we look forward to the program review visit in early March of 2020.

Dr. Andreas A. Polycarpou
Department Head

Dr. Ying Li
Graduate Program Director

Program Review Committee:

Dr. Waruna Kulatilaka
Dr. Daniel A. McAdams
Dr. Anastasia Muliana (Chair)
Dr. Alan Palazzolo
Dr. Eric Petersen
External reviews of graduate programs at Texas A&M University are mandated by Texas state law and coordinated by the Provost and Executive Vice President. The Academic Program Review (APR) process at Texas A&M provides the occasion for academic units to plan strategically, assess the quality and efficacy of the Doctor of Philosophy (Ph.D.), Master of Science (M.S.), and Master of Engineering (M.Eng.) programs in mechanical engineering, and determine the best courses of action for ongoing improvement. APR is at the heart of our institutional commitment to excellence, and we sincerely thank you for assisting us. This letter provides you with the charge to the committee and a brief overview of the department.

Peer Review Team Charge
Please examine the department and its programs and make recommendations that will help in planning improvements. Your resources are a self-study report prepared by the department, copies of materials from the program's last review, information you gain through personal interactions while visiting Texas A&M University, copies of strategic plans and goal-setting documents at the department, college, and/or university level, and any additional information requested by you or by the department. Within the broad charge of recommending ways the department can continue to improve are some specific questions that we would like you to address:

- Based on the data/information provided in the self-study report or gathered by the review team, what are the department's overall strengths and weaknesses?
- How well do the department's strategic goals align with those of its college and with those of Texas A&M University?
- How would you compare this department with its peers? Specifically, is the curriculum directly related and appropriate to the mission and goals of the institution?
- What improvements (including student learning and faculty development) has the department made since the previous program review?
- With only current resources or a modest infusion of new ones, what specific recommendations could improve the department's performance, marginally or significantly?

EXECUTIVE SUMMARY OF THE SELF-STUDY REPORT

The graduate program in the J. Mike Walker ’66 Department of Mechanical Engineering has consistently been ranked in the top ten mechanical engineering graduate programs among public institutions in the country for the past ten years. The Texas A&M mechanical engineering graduate program is currently ranked 9th among public institutions and 17th overall, based on the rankings from U.S. News and World Report. The mission of the department’s graduate program is to prepare students for careers in industry, research laboratories, government, and academia, while continuing to be a leader in cutting edge research and technology.

Over the past seven years, graduate enrollment in the department has continuously increased from 414 in 2013. At present, there are nearly 500 full time students enrolled. Approximately 51% are doctoral students, 29% are Master of Science students, and 20% are Master of Engineering students. The graduate student population is approximately 34% domestic and 66% international. The percentage of domestic Ph.D. students has continuously increased in past years. The number of female graduate students has remained between 12-17% over the past seven years, and the number of underrepresented minority (URM) graduate students (African American, Hispanic, and Native American) peaked at 8% over the past 10 years and is presently 5.6%. Along with the growth of student enrollment, the department has substantially increased student fellowships. Currently, the department has over 20 graduate endowments available for attracting both domestic and international students. With the introduction of the college of engineering graduate enhancement fee in 2018, the department receives additional funds to enhance its graduate program.
The department has undergone a dramatic change in its research infrastructure and focus areas. Currently, there are 61.43 full-time equivalent (FTE) tenured and tenure track faculty (T/TT), with 17 assistant professors, 16 associate professors, and 30 full professors. In addition, the department has had a significant increase in academic professional track (APT) faculty, which are non-tenure positions, to support the mission and goals of the department. With the departure of the material science program in 2013, faculty retirements, and faculty departures, the department continues to add new faculty members at all ranks to increase the number of core faculty. The goal is to increase the number of core faculty to 70 within the next three years. Through substantial investments from the Chancellor’s Research Initiative and Governor’s University Research Initiative, the department has recruited three National Academy of Engineering members, which will significantly impact the graduate program.

This self-study report is prepared to provide the external review committee the necessary information to evaluate the mechanical engineering graduate program at Texas A&M. A comparison of the department’s accomplishments with respect to peers is often necessary during the evaluation. The following public institutions are considered peer schools: University of California Berkeley (UC Berkeley), Georgia Institute of Technology (Georgia Tech), University of Michigan (Michigan), University of Illinois at Urbana Champaign (Illinois), Purdue University (Purdue), University of Texas Austin (UT Austin), The Pennsylvania State University (Penn State), University of California Los Angeles (UCLA), University of California San Diego (UCSD), University of Wisconsin Madison (UW Madison), and Virginia Polytechnic Institute and State University (Virginia Tech).

This report is divided into five chapters and several appendices. An introduction to the department is given in Chapter 1. Chapter 2 presents an overview of the department administration, faculty, and staff as well as the student body. Chapter 3 gives details on the graduate program itself, such as admissions, student demographics, financial support, statistics, available degree programs and their respective requirements, and course offerings. Chapter 4 presents details on the department’s research programs. The final chapter provides an assessment of the department. Appendices A, B, C, D, E, F, and G list faculty biographies, seminar speakers, Ph.D. examination process and graduate student assessment, syllabi of graduate courses, funding model, statistics of student enrollment, and assessment of student learning outcomes, respectively.
1. INTRODUCTION

1.1 BRIEF DEGREE PROGRAM HISTORY

Since the founding of the State Agriculture and Mechanical College of Texas in 1876, the mechanical arts have been an essential part of the curriculum. In 1880, the Department of Engineering, Mechanics, and Drawing first appeared and was led by Franklin Van Winkle. Total enrollment at Texas A&M was 127 students. To meet the strong trend towards industrial and vocational work, the college developed a new curriculum in 1881-82 that placed more emphasis on practical training. In 1886-87, separate departments were created for mechanical engineering and civil engineering and drawing. The Department of Mechanical Engineering now included R. H. Whitlock; assistant F. E. Giesecke, a young graduate of Texas A&M who was not yet 17; and shop foreman, A. Hablers.

In the years preceding World War I, the college enrollment grew steadily from 467 to 1,190 in 1911. Texas A&M faculty volunteered to meet the war effort by educating soldiers. The Department of Mechanical Engineering responded to the needs of the nation by training blacksmiths, automobile mechanics, machinists, draftsmen, general mechanics, and pipe fitters for the war. Following World War I, the department’s enrollment increased again. By 1927, the number of students had grown from 79 in 1917 to 264. The department adapted to the challenges of rapid technological advancement by offering students courses and laboratories to prepare them to be skilled engineers. From 1920-27, power; industrial and railway; or transportation engineering were three options offered to students.

C. W. Crawford was appointed department head in 1929, having served on the faculty since 1919. Under his direction, the three group options were eliminated from the curriculum, and individual subjects related to new technology areas, such as aerodynamics, air conditioning, and physical metallurgy, were offered as electives. By 1933, the Department of Mechanical Engineering had 254 students, the largest enrollment in the School of Engineering. In 1936-37, the department was fully accredited by the Engineering Council for Professional Development, later renamed the Accreditation Board for Engineering and Technology, Inc. (ABET). Every six years since, the department has continued to be accredited.

By 1940, the total Texas A&M enrollment had climbed to 6,482, while the School of Engineering enrolled 3,225 of these students, and over 1,100 students were in mechanical engineering. World War II found Texas A&M’s Department of Mechanical Engineering faculty again responding to the need for soldiers to be trained, even teaching at military bases throughout the state, in addition to conducting classes on campus. After the war, enrollment continued to grow rapidly in engineering, and more men were graduated in the six years between 1946 and 1952 than in the 70 years since the school opened.

Very little research was conducted in the department before 1930 except for master’s degree theses, but research gradually increased after the introduction of the Ph.D. program in 1948. Industries and government agencies began to sponsor research within the department. Fellowships and graduate assistantships likewise encouraged growth in graduate studies. In 1953, the first Ph.D. degree in mechanical engineering was awarded to L. P. Thompson who was already a mechanical engineering faculty member, and who later became dean of engineering at Arizona State University. In 1957, Clifford Simmang became department head. Under Dr. Simmang’s tenure as Head, undergraduate enrollment in the department grew from 500 to over 900, and graduate enrollment increased from 30 to 70. In addition, funded research steadily increased, with more than half of the faculty by 1979 employed part time on research projects through the Texas Engineering Experiment Station. In 1971, the department moved into the Zachry Engineering Center.
When Dr. Simmang retired in 1977, department enrollment was 1,100. He brought to a conclusion an illustrious chapter in the history of the Department of Mechanical Engineering. Under the new leadership of G. R. Hopkins, the department developed an expanded vision of its mission, built on the foundation of an excellent undergraduate program. This vision evolved during the eight-year tenure of Dr. Dennis O’Neal as the department head from 2003 to 2011. Dr. Andreas A. Polycarpou was hired in 2012 as department head and continues to serve in that role. Table 1 provides a complete summary of all the department heads of mechanical engineering.

Table 1. History of Mechanical Engineering Department Heads

<table>
<thead>
<tr>
<th>Name</th>
<th>Position</th>
<th>Years</th>
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<tbody>
<tr>
<td>Van Winkle</td>
<td>Head, Department of Engineering Mechanics and Drawing</td>
<td>1880-1883/3 years*</td>
</tr>
<tr>
<td>Whitlock</td>
<td>Head, Mechanical Engineering Acting president, Texas A&amp;M University</td>
<td>1883-1906/23 years*</td>
</tr>
<tr>
<td>Fermier</td>
<td>Head, Mechanical Engineering Director, Texas Engineering Experiment Station Vice Dean, Engineering</td>
<td>1906-1927/21 years*</td>
</tr>
<tr>
<td>Flagg</td>
<td>Interim Head, Mechanical Engineering</td>
<td>1927-1928/1 year</td>
</tr>
<tr>
<td>Bliss</td>
<td>Head, Mechanical Engineering</td>
<td>1928-1929/1 year</td>
</tr>
<tr>
<td>Crawford</td>
<td>Head, Mechanical Engineering Associate Dean, Engineering</td>
<td>1929-1957/28 years*</td>
</tr>
<tr>
<td>Simmang</td>
<td>Head, Mechanical Engineering</td>
<td>1957-1977/20 years</td>
</tr>
<tr>
<td>Hopkins</td>
<td>Head, Mechanical Engineering</td>
<td>1977-1984/7 years</td>
</tr>
<tr>
<td>Childs</td>
<td>Interim Head, Mechanical Engineering</td>
<td>1984-1985/1 year</td>
</tr>
<tr>
<td>Alter</td>
<td>Interim Head, Mechanical Engineering</td>
<td>1984-1985/1 year</td>
</tr>
<tr>
<td>Turner</td>
<td>Head, Mechanical Engineering Associate Dean, Engineering</td>
<td>1985-1989/4 years</td>
</tr>
<tr>
<td>Rabins</td>
<td>Head, Mechanical Engineering</td>
<td>1987-1989/2 years</td>
</tr>
<tr>
<td>Bradley</td>
<td>Head, Mechanical Engineering</td>
<td>1989-1993/4 years</td>
</tr>
<tr>
<td>Peterson</td>
<td>Head, Mechanical Engineering Executive Associate Dean, College of Engineering</td>
<td>1993-1996/3 years</td>
</tr>
<tr>
<td>Caton</td>
<td>Interim Head, Mechanical Engineering</td>
<td>1996-1997/1 year</td>
</tr>
<tr>
<td>Jaysuriya</td>
<td>Head, Mechanical Engineering</td>
<td>1997-2001/4 years</td>
</tr>
<tr>
<td>Weese</td>
<td>Interim Head, Mechanical Engineering</td>
<td>2001-2003/2 years</td>
</tr>
<tr>
<td>O’Neal</td>
<td>Head, Mechanical Engineering</td>
<td>2003-2011/8 years</td>
</tr>
<tr>
<td>Caton</td>
<td>Interim Head, Mechanical Engineering</td>
<td>2011-2012/1 year</td>
</tr>
<tr>
<td>Polycarpou</td>
<td>Head, Mechanical Engineering</td>
<td>2012-present</td>
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*Dates shown are inclusive of time spent in all listed positions

Over the past few decades, emphasis has been on developing the M.S. and Ph.D. programs to the same quality and reputation that the undergraduate program has enjoyed for over 100 years, dramatically increasing the department’s research activities to the point where they have a significant impact in the state of Texas, the nation, and internationally. The department’s mission has significantly increased the quality and breadth of the research program and the impact and size of the mechanical engineering graduate program. For example, the graduate enrollment has grown to 498 in fall 2019, and the total research expenditure in the FY 2019 academic year was $21.8M. The department has achieved national and international leadership in several research areas and has broadened its faculty and research to include multidisciplinary activities while further strengthening the traditional
mechanical engineering thrusts. Thus, the department now has a much larger and more diverse faculty that combines teaching with research and outreach than in previous decades. This operational change has made it possible to deliver higher quality education, since the research and outreach activities for faculty members enrich their teaching. Today, the department’s graduate program is ranked 9th in the nation among public universities according to *U.S. News & World Report*.

In September of 2018 the department received a transformative gift from former student Dr. J. Mike Walker ’66. In honor of his generous donation the department was officially named the J. Mike Walker ’66 Department of Mechanical Engineering. Walker’s unrestricted gifts will help researchers in the department develop new technologies, improve quality of life, and launch future engineering leaders. Students will also benefit from greater access to experiential learning and leadership opportunities for years to come.

Through the years, companies have sought mechanical engineering graduates from Texas A&M. The department’s former students have become prominent engineers, managers, and board chairmen. They also have become professors, department heads, deans, provosts, and presidents at colleges and universities. Since 1886, the J. Mike Walker ’66 Department of Mechanical Engineering has made a tremendous impact on the state and nation by graduating quality engineers and conducting vital research. Now and in the future, the department will continue producing high-caliber engineers who can meet the challenges of the mechanical engineering profession.

Current department enrollment is 1,446 undergraduate (excludes freshmen) and 498 graduate students. Last year over $800,000 in undergraduate scholarships and over $370,000 in graduate student fellowships were awarded. Due to the highly competitive landscape for mechanical engineering degrees, and the notable ranking of the department in comparison to its peers, the students in this program represent the best and brightest in the nation. Scholarship and fellowship support is critical for recruiting the best students in the world to Texas A&M, so it is the department’s goal to be able to offer financial support to each worthy student.

### 1.2 MISSION, STRATEGIC PLAN, GOALS

The mission of the J. Mike Walker ’66 Department of Mechanical Engineering is to serve the students of Texas A&M University, the state of Texas, and the nation by:

1. Providing quality education that is well-grounded in the fundamental principles of engineering, fostering innovation, and preparing students for leadership positions and successful careers in industry, government, and academia.
2. Advancing the knowledge base of mechanical engineering to support the competitiveness of existing industry and to spawn new economic development in Texas and the nation through active involvement in basic and applied research in a global context.
3. Providing professional development opportunities for practicing engineers through continuing education, service, and outreach activities.

In pursuit of higher national and international visibility, and to better serve the state of Texas, the nation, and the world, the faculty of the J. Mike Walker ’66 Department of Mechanical Engineering are working to accomplish the following goals:

a) Elevate faculty, teaching, research, and scholarships through the following activities

*Recruit and retain outstanding faculty*

*Establish endowments for critical research initiatives and distinguished visitors*

*Establish new research centers and strengthen existing centers with strong mechanical engineering (MEEN) affiliation*
**Increase faculty visibility**  
**Establish visiting professorships**

The department is recruiting strong faculty to improve the student to faculty ratio. As well, faculty with skills to address emerging research challenges with critical societal impact are being recruited. The department continually strives to increase resources to provide competitive salaries, professorships, and resources to retain top faculty.

The J. Mike Walker '66 Department of Mechanical Engineering currently has strong affiliations with the Turbomachinery Laboratory, the Energy Systems Laboratory, the Center for Autonomous Vehicle and Sensor Systems (CANVASS), the Army Futures Command (AFC), the Energy Institute, and the Center of Innovation in Mechanics for Design and Manufacturing (CiDM). The department will continue to support affiliations with these Texas A&M Engineering Experiment Station (TEES) and university centers. In addition, MEEN faculty are supported to affiliate with other TEES and university-level collaborative research initiatives. To increase department visibility, faculty members are involved with professional societies and the goal is that each senior faculty member is a Fellow of their respective societies.

b) **Strengthen the graduate programs**

*Recruit highest quality graduate students*  
*Fund 100% of our doctoral students with assistantships and fellowships*  
*Modernize graduate curriculum and prepare students for successful careers in academia, industry and government*  
*Diversify the composition of the graduate student body*

The department seeks to attract the highest quality domestic and international students to the graduate program. The department currently has more than $7 million in endowments for graduate fellowships, providing more than $370,000 per year of funding to graduate students. These fellowships are in addition to research or teaching assistantships and the new graduate program fee, which will provide over $1M annually at steady state. The graduate office works to match prospective students to current faculty who have parallel research interests, and to develop competitive funding packages to recruit the best students. Qualified students will also be nominated for college- and university-level funding packages. Currently, more than 90% of doctoral students are funded by assistantships or fellowships. The department’s goal is to fund 100% of doctoral students through a stronger faculty research program and endowed fellowships.

The graduate program will also work to modernize the graduate curriculum in mechanical engineering by developing new courses and changing existing courses. For example, topical courses including, but not limited to, machine learning, data science, advanced manufacturing, robotics, and autonomous vehicles are being developed. The majority of the department’s graduates work in industry after graduation. The department would like to see more placement of graduates in academia by strengthening graduate mentoring and training through a variety of programs, such as the graduate teaching fellow program and special training courses.

The graduate program aims to diversify the student population. Currently 66% of mechanical engineering graduate students are international, 6% are underrepresented minorities, and 13% are female. The five-year goal is to have a student population that is at least 40% domestic, 20% female, and 10% underrepresented minorities. To attain this, targeted recruitment efforts must be implemented by the graduate office and in close collaboration with faculty.
c) Enhance the undergraduate experience

- Improve the quality and diversity of incoming freshmen
- Increase scholarships for undergraduates
- Improve and streamline curriculum in undergraduate laboratories and classrooms to address contemporary issues
- Increase participation in co-operative and study abroad programs
- Introduce program specific ethics modules

Undergraduate scholarships have increased significantly in the last five years. The department will continue to increase those scholarships and recruit diverse and high quality students to the program by communicating exciting opportunities in many areas of mechanical engineering, and by providing long-term scholarships that carry through to students’ graduation.

Laboratories provide students with ‘hands-on’ experience of instrumentation, manufacturing, systems and control, fluids, and heat transfer. The Zachry Engineering Education Complex has allowed for significant improvements and modernization of laboratory facilities and equipment. The department continues to improve the curriculum in undergraduate laboratories revolving around new and modern equipment and contemporary needs of graduating mechanical engineering undergraduates. The department is also updating the undergraduate curriculum and streamlining courses to enhance the undergraduate experience. The goal is to lead the nation in such efforts to modernize and enhance the mechanical engineering curriculum. Recently, an elective course focused on entrepreneurship and another focused on innovation mindset were introduced in both the undergraduate and graduate curriculum.

Cooperative, internship, and study-abroad experiences enrich the undergraduate program in mechanical engineering. The department will continue to increase these offerings to provide additional student opportunities.

As a college-wide effort, general engineering ethics has been added to the common introduction to engineering courses. The department will develop and introduce program-specific ethics modules in key mechanical engineering courses.

### 1.3 ANALYSIS OF GRADUATE PROGRAM

The strategic plan of the graduate program is well aligned with the missions of the department, College of Engineering, and university to enhance the quality of education and research, and to prepare its students for the ever-changing need of the mechanical engineering profession. The department has a Graduate Studies and Research Committee (GSRC) to oversee the graduate curriculum and degree requirements, strategies for attracting and admitting highly qualified graduate students, and financial support for graduate students. The department also has a strategic planning committee to help identify new research focuses and the department’s strengths, weaknesses, opportunities, and threats (Section 5) to improve the graduate program.

As mentioned in Section 1.2., the department is committed to providing high quality education, supporting the existing industry and new economic development, preparing students for careers in academia, promoting diversity, and training engineers and scientists through continuing education, service and outreach activities. The department has continuously improved its graduate programs by increasing domestic student populations, offering new fellowships to attract minority and underrepresented students, participating in the college of engineering graduate teaching fellow (GTF), and hiring new faculty with expertise in emerging technology and multi-disciplinary research backgrounds.
The mechanical engineering department offers Master of Engineering, master of science (thesis), and doctor of philosophy degrees which are appropriate for preparing students for careers in industry, research laboratories, government, and academia. The Master of Engineering degree is offered on campus and through distance learning. The graduate curriculum includes basic core courses, which prepare its students fundamental knowledge within the traditional mechanical engineering, and elective courses, which introduce them to emerging technologies and research topics. Some of these elective courses have become permanent courses (see Section 3).

1.4 SUMMARY OF LAST APR EXTERNAL REVIEW (2013)

The external review team consisting of Dr. Kon-Well Wang (Chair), Dr. Jay Gore, and Dr. Paul Neitzel presented their written report from their visit in March, 2013. Their comments and feedback were very favorable with regard to the significant progress made by the department since the previous external review, the thoroughness of the written report, and their impressions from the visit. The specific strengths that were singled out by the committee are as follows.

- Reputation and ranking have improved significantly in recent years
- Ph.D. graduate student enrollment % increased in recent years
- Some faculty proactively recruiting students outside the pool
- Speaker series enhanced visibility
- Strong endowment
- Strong funding both internal and external
- Outstanding faculty hires in recent years

No weaknesses were pointed out by the review team. Several recommendations for improvement were suggested in the report, and improvements made since the previous APR are summarized below. The specific comments are provided and highlighted in italics for convenience, followed by the department’s response.

Perform planning process and develop strategic plan
The department has formed a strategic planning committee to oversee its long-range strategic plan and research direction. A strategic plan report discussing departmental thrust areas was prepared in 2014, and during the 2018 faculty retreat the department revisited these focus areas. The department is currently preparing an update to the strategic plan, which will be available in 2020. Several research areas, i.e., artificial intelligence, autonomous vehicles, biomechanics, human-robot interaction, manufacturing, and renewable energy, have been identified.

Pursue center type activities
The department is committed to providing incentives to pursue such activities. In 2019, Dr. Daniel A. McAdams was named the inaugural Associate Department Head of Research and Strategic Initiatives to support faculty in research activities. The department assigned a staff person (50% FTE) for research support as well. In January 2020, this staff position increased to 100% FTE. The department solicits applications for seed funding from faculty for research initiatives, which can include pursuing center-type activities. Additionally, Dr. McAdams works strategically with faculty on grant seeking activities. The department is pursuing collaborative research activities in various areas discussed above in alignment with the effort and focus of the College of Engineering and TEES.

Improve recruitment of graduate students, both domestic and international students
The department has increased recruitment efforts of graduate students through college- and department-level efforts in recent years. Until 2019, the College of Engineering has worked with departments to bring well-qualified prospective students for a campus visit in the fall semester. This program is intended to recruit domestic Ph.D. students to Texas A&M. During these visits, the mechanical engineering department has matched students to potential faculty advisors based on similarities in research interests. In fall 2019, this event was replaced with...
a virtual graduate program fair where each department hosted an online “booth” for students to visit and chat with graduate program staff in real-time. The virtual fair allowed for a broader reach that included both international and domestic students. Additionally, a spring campus visit is hosted for top domestic Ph.D. admits, once again trying to match them with a potential faculty advisor.

As funding is an important factor in recruiting top Ph.D. students, the department has created multi-year cost-sharing funding packages that include research and teaching assistant positions and fellowship money. This funding model matches students with faculty advisors beginning in the first year and exposes them to research and teaching early on in their studies. A full description of this funding model is available in Appendix E. Additionally, the department is actively nominating students for multi-year college- and university-level funding packages such as the College of Engineering Merit Fellowship and the Diversity Excellence Fellowship.

The department has also created a recruitment sub-committee within the Graduate Studies and Research Committee (GSRC) to increase faculty involvement in the admissions and recruitment process. This sub-committee is responsible for setting admissions standards and assisting with outreach to prospective and admitted students. In fall 2019, for the first time in recent history, the graduate program had a larger number of incoming domestic Ph.D. students than international Ph.D. students. Other notable recruitment efforts include attendance at the 2019 Society of Women Engineers conference and increased intentional follow-up with Ph.D. applicants.

**Evaluate and improve the qualifying exam**
In response to the last program review, the format to the mechanical engineering qualifying exam has changed significantly. The previous format was comprised of eight individual exams covering graduate-level material in the fundamental areas of controls, design, dynamics, fluid mechanics, heat transfer, metals/ceramics/polymers, solid mechanics, and thermodynamics. Students were required to earn a passing score on two exams. The current format is a single exam testing graduate-level understanding undergradate material. The exam consists of two questions from each fundamental area of controls, design, dynamics, fluid mechanics, heat transfer, solid mechanics, and thermodynamics. Students are required to complete any four questions to earn a single score on the exam. Detailed information on the qualifying exam is given in Section 3.

**Evaluate the division structure to better reflect teaching/research communities**
The department does not have research divisions as current demands in research activities are focused on emerging technology, driven by collaborative and interdisciplinary works.

**Faculty mentoring and retention**
The department has established a faculty mentoring program that matches all junior, mid-level, and academic professional track faculty members with at least one established, tenured professor. Having 2-3 faculty mentors is encouraged. Additionally, all incoming faculty are assigned an onboarding mentor, no matter their rank. The mentoring program goes beyond academics and enables newcomers to the department/university to understand and adapt to the academic culture through individual mentoring activities, as well as those organized by the mentoring committee. The intention of this program is to set new faculty up for success and enable them to thrive in teaching, research, and service.

**Systematically nominate faculty for external awards**
The department has an active honors and awards committee that provides recommendations to the department head for external award nominations. Additionally, a database is maintained in the department of past nominations and award opportunities. Two staff members are specifically assigned to support the nomination process. Additionally, recently, the college and university have also provided support for major external faculty award nominations.

**Careful planning for “25-by-25”**
The 25x25 initiative, where the college of engineering will grow to 25,000 students by 2025, was established by the dean and vice chancellor of engineering and is primarily managed at the college level. The initiative impacts both undergraduate and graduate programs, but focuses largely on undergraduate growth through retention efforts and off-campus locations. The largest path of graduate growth for this initiative is through online master’s programs. The ‘25x25’ planning focuses on increasing the number of undergraduate students, which is handled by the college. The department controls admission of sophomore students through a holistic review process, with the exception of students who are automatically admitted because they have a GPA of 3.5 or higher. The department sets its own limits on the number of students to be admitted into the undergraduate program.

*Build research and education collaborations with other departments via both grass-root and administrative paths*

Mechanical engineering faculty actively collaborate with other departments across different colleges/schools at Texas A&M. A number of collaborative research projects from multiple funding sources (internal and external) have increased in the past eight years. This increase, in part, came from the President’s Excellence Fund to promote multi-disciplinary research activities across different colleges/schools.

*Expand the Industry Development and Advisory Council to become External Advisory Board with some academicians*

The name of this council is now the Industry Advisory Council. The board is made up of individuals from industry to allow for input from individuals working in the field. The department head uses an ad hoc “advisory board” with senior academicians for advice and mentorship.
2. STRUCTURE OF MECHANICAL ENGINEERING DEPARTMENT

The mechanical engineering department offers Bachelor of Science, Master of Engineering, Master of Science, and Doctor of Philosophy degrees and currently has 1,446 undergraduate and 498 graduate students enrolled. Students are studying and conducting research in a wide range of mechanical engineering related subjects. The department includes 61.43 FTE T/TT faculty (including two joint appointments), 18 APT faculty, 16 faculty members with courtesy appointments, and 31 staff members.

2.1 ADMINISTRATIVE ORGANIZATION

This department follows a department head structure, where the current head is Dr. Andreas Polycarpou. The administrative team also includes an associate department head of research and strategic initiatives who also serves as the undergraduate program director, Dr. Daniel McAdams; an associate department head of undergraduate programs, Dr. Prabhakar Pagilla; and a graduate program director, Dr. Ying Li. An industry-led advisory board is also an integral part of the departmental organization. Further details on the faculty, the advisory board, and the student body are provided in the following sections.

There are currently 31 staff members within or assigned to the department, and a summary is provided as Table 2. Information technology, communications, and business units are centralized through the college with staff embedded within the department. An administrator, Sharli Nucker, oversees the departmental staff which includes administrative, facilities, and advising. Faculty program directors in graduate and undergraduate advising also provide supervision to the advising staff in conjunction with Ms. Nucker. Additionally, two development officers are assigned by the Texas A&M Foundation to support the department.

Table 2. List of mechanical engineering staff members

<table>
<thead>
<tr>
<th>Last Name</th>
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<th>Title</th>
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<tbody>
<tr>
<td>Barnett</td>
<td>Sarai</td>
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<tr>
<td>Beck</td>
<td>Doug</td>
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<td>Caldwell*</td>
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<td>Charanza</td>
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<td>Douglas</td>
<td>Michael</td>
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<td>Dumas</td>
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<tr>
<td>Kornhoff*</td>
<td>Ray</td>
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<td>Kuhlmann*</td>
<td>Steve</td>
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<td>Kunkle</td>
<td>Gregory</td>
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Table 2. List of mechanical engineering staff members (continued)

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<tr>
<td>Latham</td>
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<td>Lopez</td>
<td>Ubaldo</td>
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<td>Moehlman-Welch*</td>
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<td>Muir</td>
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<tr>
<td>Nucker</td>
<td>Sharli</td>
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<td>Phillips*</td>
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<tr>
<td>Revels*</td>
<td>Michelle</td>
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<td>Rodriguez*</td>
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<td>Schmitt</td>
<td>Ashley</td>
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<td>Simison</td>
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<tr>
<td>Simon</td>
<td>Rebecca</td>
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<tr>
<td>Vasquez</td>
<td>Reveca</td>
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<tr>
<td>Vickers</td>
<td>Bridgette</td>
<td>Academic Advisor II</td>
</tr>
<tr>
<td>Wittneben*</td>
<td>Mitch</td>
<td>Associate Director/IT</td>
</tr>
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</table>

2.2 THE FACULTY

Since the previous program review seven years ago, several significant changes to the graduate program have occurred, particularly with regard to the demographics of both the students and the faculty. The faculty members include tenured and tenure track (T/TT) and academic professional track (APT). Research active T/TT faculty members teach three courses per academic year, where 1-credit hour studio courses are usually counted as one course. Recently hired faculty are given a reduced teaching load of one course per semester during their probationary period of five years. In addition to teaching, faculty also advise graduate students and have service activities. Faculty members that are not research active teach two to three courses per semester and have service activities. In addition to the core faculty, the department has a significant increase in APT faculty, which are non-tenure positions. APT faculty teach three courses per semester. A complete list of the current mechanical engineering faculty members, including their titles, is provided in Table 3. The average number of tenured/tenure track faculty over the past seven years is 54. Figure 1 summarizes the number of full, associate, and assistant professors and APT faculty in mechanical engineering over the past several years. The number of APT faculty has increased more than four times since 2013, which is associated with the increased number of undergraduate students from the 25x25 initiative. The percentage of female T/TT faculty in the department has increased significantly, as shown in Figure 2. The department also maintains a quite diverse group of T/TT faculty, as shown in Figure 3. Figure 1 shows the faculty trends in recent years.
### Table 3. List of mechanical engineering faculty members

<table>
<thead>
<tr>
<th>Name</th>
<th>Title</th>
<th>Category</th>
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</thead>
<tbody>
<tr>
<td>Allaire, Douglas</td>
<td>Assistant Professor, Sallie and Don Davis ’61 Faculty Fellow</td>
<td>T/TT</td>
</tr>
<tr>
<td>Alvarado, Jorge</td>
<td>Professor, Engineering Technology &amp; Industrial Distribution</td>
<td>Courtesy</td>
</tr>
<tr>
<td>Amiri, Ahmad</td>
<td>Visiting Assistant Professor</td>
<td>APT</td>
</tr>
<tr>
<td>Anand, N.K.</td>
<td>Regents Professor, James M. ’12 and Ada Sutton Forsyth Professor, Executive Associate Dean of Engineering, TEES Associate Director</td>
<td>T/TT</td>
</tr>
<tr>
<td>Antao, Dion</td>
<td>Assistant Professor</td>
<td>T/TT</td>
</tr>
<tr>
<td>Arroyave, Raymundo</td>
<td>Professor, Presidential Impact Fellow, Materials Science and Engineering</td>
<td>Courtesy</td>
</tr>
<tr>
<td>Asadi, Amir</td>
<td>Assistant Professor, Engineering Technology &amp; Industrial Distribution</td>
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<tr>
<td>Balas, Mark</td>
<td>Professor</td>
<td>T/TT</td>
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<tr>
<td>Balawi, Shadi</td>
<td>Associate Professor of Instruction</td>
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<tr>
<td>Banerjee, Debiyoti</td>
<td>Professor, James J. Cain ’51 Faculty Fellow I</td>
<td>T/TT</td>
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<tr>
<td>Benjamin, Chandler</td>
<td>Assistant Professor</td>
<td>T/TT</td>
</tr>
<tr>
<td>Borazjani, Iman</td>
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</tr>
<tr>
<td>Caton, Jerald</td>
<td>Professor</td>
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<td>Charoenphol, Ploy</td>
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<td>Claridge, David</td>
<td>Professor, Director of Energy Systems Laboratory</td>
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<td>Cope, Dale</td>
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<td>Corleto, Carlos</td>
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<td>Darbha, Swaroop</td>
<td>Professor</td>
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<tr>
<td>Delgado, Adolfo</td>
<td>Associate Professor</td>
<td>T/TT</td>
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<td>Erdemir, Ali</td>
<td>Professor, TEES Eminent Professor, NAE member</td>
<td>T/TT</td>
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<td>Felts, Jonathan</td>
<td>Assistant Professor</td>
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<td>Freed, Alan</td>
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<td>Girimaji, Sharath</td>
<td>Professor &amp; Wofford Cain Chair II, Aerospace Engineering; Department Head, Ocean Engineering</td>
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<td>Goenezen, Sevan</td>
<td>Assistant Professor</td>
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<td>Gopalswamy, Swaminathan</td>
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<td>Grunlan, Jaime</td>
<td>Professor, Linda &amp; Ralph Schmidt ’68 Professor</td>
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<td>Haglund, John</td>
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<td>Han, Je-Chin</td>
<td>Distinguished Professor, Marcus C. Easterling Chair Professor</td>
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<td>Hasnain, Zohaib</td>
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<td>Professor, Royce E. Wisenbaker ’39 II Chair in Engineering, Nuclear Engineering, NAE member</td>
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<td>Hipwell, M. Cynthia</td>
<td>Professor, TEES Eminent Professor (Chair), NAE member</td>
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<td>Hogan, Harry</td>
<td>Professor, Associate Dean for Graduate Programs</td>
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<td>Hsieh, Sheng-Jen</td>
<td>Professor, Engineering Technology &amp; Industrial Distribution</td>
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Table 3. List of mechanical engineering faculty members (continued)

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<td>Jacobs, Timothy</td>
<td>Professor, Steve Brauer Jr. ‘02 Faculty Fellow, Director of Interdisciplinary Engineering for Undergraduate and Graduate Programs</td>
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<tr>
<td>Radovic, Miladin</td>
<td>Associate Professor, Associate Department Head, MSEN</td>
<td>Courtesy</td>
</tr>
<tr>
<td>Rajagopal, Kumbakonam</td>
<td>Distinguished Professor, Regents Professor, J.M. Forsyth Chair</td>
<td>T/TT</td>
</tr>
<tr>
<td>Rasmussen, Bryan</td>
<td>Professor</td>
<td>T/TT</td>
</tr>
<tr>
<td>Rathinam, Sivakumar</td>
<td>Associate Professor</td>
<td>T/TT</td>
</tr>
<tr>
<td>Reddy, Junuthula</td>
<td>University Distinguished Professor, Regents Professor, Oscar S. Wyatt</td>
<td>T/TT</td>
</tr>
<tr>
<td></td>
<td>Jr. Chair Professor, NAE member</td>
<td></td>
</tr>
<tr>
<td>San Andres, Luis</td>
<td>Professor, Mast-Childs Chair Professor</td>
<td>T/TT</td>
</tr>
<tr>
<td>Saripalli, Srikanth</td>
<td>Associate Professor, Gulf Oil/Thomas A. Dietz Career Development</td>
<td>T/TT</td>
</tr>
<tr>
<td></td>
<td>Professor II, Director of CANVASS</td>
<td></td>
</tr>
<tr>
<td>Schobeiri, Meinhard</td>
<td>Senior Professor</td>
<td>APT</td>
</tr>
<tr>
<td>Scully, Marlan</td>
<td>Distinguished Professor, Physics; NAS member</td>
<td>Courtesy</td>
</tr>
<tr>
<td>Seets, Chris</td>
<td>Professor of Practice</td>
<td>APT</td>
</tr>
<tr>
<td>Song, Xingyong</td>
<td>Assistant Professor, Corrie and Jim Furber ’64 Faculty Fellow,</td>
<td>Courtesy</td>
</tr>
<tr>
<td></td>
<td>Engineering Technology &amp; Industrial Distribution</td>
<td></td>
</tr>
<tr>
<td>Srinivasa, Arun</td>
<td>Professor, Holdredge/Paul Professor</td>
<td>T/TT</td>
</tr>
<tr>
<td>Staack, David</td>
<td>Associate Professor, Sallie and Don Davis ’61 Career Development</td>
<td>T/TT</td>
</tr>
<tr>
<td></td>
<td>Professor II, Director of Engineering Laboratory Instruction</td>
<td></td>
</tr>
<tr>
<td>Sue, Hung-Jue</td>
<td>TEES Research Professor, Materials Science and Engineering</td>
<td>Courtesy</td>
</tr>
<tr>
<td>Suh, Chii-Der</td>
<td>Associate Professor</td>
<td>T/TT</td>
</tr>
<tr>
<td>Tai, Li-Jung</td>
<td>Assistant Professor, Mechanical Engineering Industry Advisory Council</td>
<td>T/TT</td>
</tr>
<tr>
<td></td>
<td>Faculty Fellow</td>
<td></td>
</tr>
<tr>
<td>Tseenn, Joanna</td>
<td>Assistant Professor of Instruction</td>
<td>APT</td>
</tr>
<tr>
<td>Tseregounis, Spyros</td>
<td>Professor of Practice</td>
<td>Joint/APT</td>
</tr>
<tr>
<td>Wang, Jywhen</td>
<td>Professor, Engineering Technology &amp; Industrial Distribution</td>
<td>Courtesy</td>
</tr>
<tr>
<td>Wang, Ya</td>
<td>Associate Professor</td>
<td>T/TT</td>
</tr>
<tr>
<td>Wen, Sy-Bor</td>
<td>Associate Professor</td>
<td>T/TT</td>
</tr>
<tr>
<td>Wilkerson, Justin</td>
<td>Assistant Professor, James J. Cain ’51 Faculty Fellow II</td>
<td>T/TT</td>
</tr>
</tbody>
</table>
Table 3. List of mechanical engineering faculty members (continued)

<table>
<thead>
<tr>
<th>Name</th>
<th>Title</th>
<th>Category</th>
</tr>
</thead>
<tbody>
<tr>
<td>Wright, Lesley</td>
<td>Associate Professor, Jana and Quentin A. Baker ’78 Faculty Fellow</td>
<td>T/TT</td>
</tr>
<tr>
<td>Yu, Choongho</td>
<td>Associate Professor, Sallie and Don Davis ’61 Faculty Fellow II</td>
<td>T/TT</td>
</tr>
<tr>
<td>Zambrano, Byron</td>
<td>Research Assistant Professor</td>
<td>APT</td>
</tr>
<tr>
<td>Zhang, Xudong</td>
<td>Professor, Liollio Family Faculty Fellow, Industrial &amp; Systems Engineering</td>
<td>Courtesy</td>
</tr>
</tbody>
</table>

![Number of Faculty in Mechanical Engineering at Texas A&M University by Rank (2013-2018)](chart)

**Figure 1.** Number of core T/TT and APT faculty: full, associate, assistant, and APT
Figure 2. Percent of T/TT female faculty in the mechanical engineering department

Figure 3. Ethnicity of T/TT faculty as of fall 2019
The department also maintains many chair, professional development professorships for associate professors, and faculty fellowships for all ranks. Table 4 provides the named positions and the current position holders. The number of endowed position holders has more than doubled since the last review in 2013. The research expenditures in mechanical engineering over the past several years have remained steady. With more than half of the faculty hired during the last six years, expenditures are expected to increase as new faculty establish their research programs. The total number of publications of full, associate, and assistant professors in mechanical engineering is given in Table 6. Starting 2016, a split credit is considered when reporting the number of refereed journal publications, conference proceedings, and textbooks co-authored by two or more faculty within the department or the College of Engineering, so each publication may only be counted once within the College of Engineering. Overall, research expenditures and the number of faculty publications over the past several years have been steady.

Table 4. Endowed positions in mechanical engineering

<table>
<thead>
<tr>
<th>Name</th>
<th>Position</th>
</tr>
</thead>
<tbody>
<tr>
<td>Allaire, Douglas</td>
<td>Sallie and Don Davis ’61 Faculty Fellow</td>
</tr>
<tr>
<td>Anand, N.K.</td>
<td>James M. ’12 and Ada Sutton Forsyth Professor</td>
</tr>
<tr>
<td>Banerjee, Debiyoti</td>
<td>James J Cain ’51 Faculty Fellow I</td>
</tr>
<tr>
<td>Erdemir, Ali</td>
<td>TEES Eminent Professor (Chair)</td>
</tr>
<tr>
<td>Grunlan, Jaime</td>
<td>Linda &amp; Ralph Schmidt ’68 Professor</td>
</tr>
<tr>
<td>Han, J.C.</td>
<td>Marcus C. Easterling Chair Professor</td>
</tr>
<tr>
<td>Hipwell, Cynthia</td>
<td>TEES Eminent Professor (Chair)</td>
</tr>
<tr>
<td>Hubbard, James</td>
<td>TEES Eminent Professor (Chair)</td>
</tr>
<tr>
<td>Jacobs, Timothy</td>
<td>Steve Brauer Jr ’02 Faculty Fellow</td>
</tr>
<tr>
<td>Kulating, Waruna</td>
<td>Morris E. Foster Faculty Fellow I</td>
</tr>
<tr>
<td>Li, Ying</td>
<td>Pioneer Natural Resources Faculty Fellow III</td>
</tr>
<tr>
<td>Liang, Hong</td>
<td>Oscar S. Wyatt Jr. Professor</td>
</tr>
<tr>
<td>Malak, Richard</td>
<td>Gulf Oil/Thomas A. Dietz Career Development Professor I</td>
</tr>
<tr>
<td>McAdams, Daniel</td>
<td>Robert H. Fletcher Professor</td>
</tr>
<tr>
<td>Moreno, Michael</td>
<td>J. Mike Walker ’66 Faculty Fellow</td>
</tr>
<tr>
<td>Muliana, Anastasia</td>
<td>G. Paul Pepper ’54 Professor</td>
</tr>
<tr>
<td>Needleman, Alan</td>
<td>TEES Eminent Professor (Chair)</td>
</tr>
<tr>
<td>Pagilla, Prabhakar</td>
<td>James J. Cain ’51 Professor II</td>
</tr>
<tr>
<td>Palazzo, Alan</td>
<td>James J. Cain ’51 Professor I</td>
</tr>
<tr>
<td>Petersen, Eric</td>
<td>Nelson-Jackson Chair</td>
</tr>
<tr>
<td>Polycarpou, Andreas</td>
<td>James J. Cain ’51 Chair, Meinhard H. Kotzebue ’14 Professor</td>
</tr>
<tr>
<td>Rajagopal, K.R.</td>
<td>J.M. Forsyth Chair</td>
</tr>
<tr>
<td>Reddy, J.N.</td>
<td>Oscar S. Wyatt Jr. Chair Professor</td>
</tr>
<tr>
<td>San Andres, Luis</td>
<td>Mast-Childs Chair Professor</td>
</tr>
<tr>
<td>Saripalli, Srikanth</td>
<td>Gulf Oil/Thomas A. Dietz Career Development Professor II</td>
</tr>
<tr>
<td>Srinivasa, Arun</td>
<td>Holdridge/Paul Professor</td>
</tr>
<tr>
<td>Staack, David</td>
<td>Sallie and Don Davis ’61 Career Development Professor</td>
</tr>
<tr>
<td>Tai, Bruce</td>
<td>Mechanical Engineering Industry Advisory Council Faculty Fellow</td>
</tr>
<tr>
<td>Wang, Ya</td>
<td>Leland T. Jordan Career Development Professor</td>
</tr>
<tr>
<td>Wilkerson, Justin</td>
<td>James J Cain ’51 Faculty Fellow II</td>
</tr>
<tr>
<td>Wright, Lesley</td>
<td>Jana &amp; Quentin A. Baker ’78 Faculty Fellow</td>
</tr>
<tr>
<td>Yu, Choongho</td>
<td>Sallie and Don Davis ’61 Faculty Fellow II</td>
</tr>
<tr>
<td>Vacant</td>
<td>Gulf Oil/Thomas A. Dietz Professor</td>
</tr>
</tbody>
</table>
Table 4. Endowed positions in mechanical engineering (continued)

<table>
<thead>
<tr>
<th>Name</th>
<th>Position</th>
</tr>
</thead>
<tbody>
<tr>
<td>Vacant</td>
<td>Morris E. Foster Faculty Fellow II</td>
</tr>
<tr>
<td>Vacant</td>
<td>Leland T. Jordan Chair</td>
</tr>
<tr>
<td>Vacant</td>
<td>Leland T. Jordan Professor</td>
</tr>
</tbody>
</table>

Table 5. Mechanical Engineering research expenditures (MAESTRO, January 30, 2020)

<table>
<thead>
<tr>
<th>Fiscal Year</th>
<th>FY15</th>
<th>FY16</th>
<th>FY17</th>
<th>FY18</th>
<th>FY19</th>
</tr>
</thead>
<tbody>
<tr>
<td>Research Expenditures</td>
<td>$24,700,000</td>
<td>$22,020,000</td>
<td>$18,890,000</td>
<td>$20,230,000</td>
<td>$20,580,000</td>
</tr>
</tbody>
</table>

Table 6. Count and average of T/TT faculty journal publications

<table>
<thead>
<tr>
<th>Year</th>
<th>Full Professors</th>
<th>Associate Professors</th>
<th>Assistant Professors</th>
<th>Overall</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Year</td>
<td>Total</td>
<td>Average</td>
<td>Total</td>
</tr>
<tr>
<td>2014</td>
<td>150</td>
<td>6</td>
<td>71</td>
<td>38</td>
</tr>
<tr>
<td>2015</td>
<td>194</td>
<td>6.7</td>
<td>48</td>
<td>37</td>
</tr>
<tr>
<td>2016</td>
<td>163.1</td>
<td>6</td>
<td>44</td>
<td>45</td>
</tr>
<tr>
<td>2017</td>
<td>155.3</td>
<td>6.8</td>
<td>56</td>
<td>51.5</td>
</tr>
<tr>
<td>2018</td>
<td>205.6</td>
<td>7.9</td>
<td>79.5</td>
<td>45.5</td>
</tr>
</tbody>
</table>

2.3 INDUSTRY ADVISORY COUNCIL

One key element in the success of the mechanical engineering program is the significant involvement with industry and the substantial support from many industrial friends. Of particular importance is the Industry Advisory Council, which met for the first time in 1989 as a forum where the department could interact more effectively with its primary customers. Composed of individuals who are leaders in industry and government agencies, the council provides a broad perspective on the changing requirements for engineering education and helps the department identify new opportunities in research. Many changes in the department are the result of the guidance provided by this distinguished council, which meets twice each year. Table 7 presents a list of the current, active members and their industry affiliations.

Table 7. List of Industry Advisory Council members and their industry affiliations

<table>
<thead>
<tr>
<th>Name</th>
<th>Company</th>
<th>Title</th>
</tr>
</thead>
<tbody>
<tr>
<td>Adams, David</td>
<td>Halliburton Company</td>
<td>Senior Vice President-Completion and Production Division</td>
</tr>
<tr>
<td>Anderson, Lane</td>
<td>QTS</td>
<td>Vice President- Development</td>
</tr>
<tr>
<td>Armstrong, Randy</td>
<td>Raytheon Company</td>
<td>Technical Staff / Composite Engineering</td>
</tr>
<tr>
<td>Baker, Quentin</td>
<td>Baker Engineering and Risk Consultants, Inc</td>
<td>President</td>
</tr>
<tr>
<td>Bankston Goertz, Susan</td>
<td>Halliburton</td>
<td>Retired</td>
</tr>
<tr>
<td>Bayh III, Russell</td>
<td>Halliburton</td>
<td></td>
</tr>
</tbody>
</table>
Table 7. List of Industry Advisory Council members and their industry affiliations (continued)

<table>
<thead>
<tr>
<th>Name</th>
<th>Company</th>
<th>Title</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bloomquist, Larry</td>
<td>Mechanical Reps, Inc.</td>
<td>Principal</td>
</tr>
<tr>
<td>Bundy, Tom</td>
<td>ConocoPhillips</td>
<td>Retired</td>
</tr>
<tr>
<td>Chenanda, Cary</td>
<td>Cummins Inc.</td>
<td>Vice President, Cummins Electronics and Fuel Systems</td>
</tr>
<tr>
<td>Clark, H. Craig</td>
<td>Wishbone Energy Partners</td>
<td>President and CEO</td>
</tr>
<tr>
<td>Cleary, Wade</td>
<td>Cleary Zimmermann Engineers</td>
<td>Managing Principal</td>
</tr>
<tr>
<td>Cory, Shelly</td>
<td>Baker Hughes, a GE Company</td>
<td>Sales Senior Manager</td>
</tr>
<tr>
<td>Dixon, Don P.</td>
<td>DPD Manufacturing Company</td>
<td>Retired-President and Founder</td>
</tr>
<tr>
<td>Eberly, Chris</td>
<td>Park USA</td>
<td>CEO/Director of Engineering</td>
</tr>
<tr>
<td>Fox, Craig</td>
<td>Angelo, Gordon &amp; Co.</td>
<td>Managing Director</td>
</tr>
<tr>
<td>Havelka, Jim</td>
<td>InformAI</td>
<td>CEO</td>
</tr>
<tr>
<td>Havis, Charlie</td>
<td>Lockheed Martin Aeronautics</td>
<td></td>
</tr>
<tr>
<td>Hightower, Brenda</td>
<td>Solomon Associates</td>
<td>Project Manager, Digital Solutions</td>
</tr>
<tr>
<td>Kishan, Sandeep</td>
<td>Eastern Research Group</td>
<td>Vice President</td>
</tr>
<tr>
<td>Kuiper, Craig</td>
<td>Pioneer Natural Resources</td>
<td></td>
</tr>
<tr>
<td>Land III, George</td>
<td>Ingersoll Rand</td>
<td>General Manager, Connected Home Solutions</td>
</tr>
<tr>
<td>Lipscomb, Jeff</td>
<td>JWL Engineering</td>
<td>Principal</td>
</tr>
<tr>
<td>Lynn, Kathy</td>
<td>Sumitomo Mitsui Bank</td>
<td>Executive Director</td>
</tr>
<tr>
<td>Martin, Rusty</td>
<td>ExxonMobil</td>
<td>Facility Supervisor</td>
</tr>
<tr>
<td>Meline, Kenneth</td>
<td>DFW Consulting Group Inc. &amp; Command Commissioning</td>
<td>Principal</td>
</tr>
<tr>
<td>Miller, Jack</td>
<td>Stress Engineering Services, Inc.</td>
<td>President</td>
</tr>
<tr>
<td>Mitchell, Gary</td>
<td>Anadarko Petroleum Corporation</td>
<td>Director-GOM Production Operations</td>
</tr>
<tr>
<td>Morrow, Laurie</td>
<td>The Boeing Company</td>
<td>Manager-International Space Station Mission, Crew &amp; Configuration Team</td>
</tr>
<tr>
<td>Moses, Scott</td>
<td>Oil States Industries, Inc.</td>
<td>President</td>
</tr>
<tr>
<td>Mottin, Suzanne</td>
<td>Occidental Energy Ventures LLC</td>
<td>Director, Power</td>
</tr>
<tr>
<td>Muyskondt, Arnold</td>
<td>Sandia National Laboratories</td>
<td>Manager</td>
</tr>
<tr>
<td>Nelson, Andrew</td>
<td>Lisam Systems</td>
<td>CEO, Americas</td>
</tr>
<tr>
<td>Oliver, Edis</td>
<td>Wiss, Janney, Elstner Associates, Inc. (WJE)</td>
<td>Principal</td>
</tr>
<tr>
<td>Pelletier, Tony</td>
<td>Alamo Resources, LLC</td>
<td>President &amp; CEO</td>
</tr>
<tr>
<td>Pierpauline, David</td>
<td>Dyno Nobel</td>
<td>Sr. VP US Nitrogen Manufacturing</td>
</tr>
<tr>
<td>Piper, Michael</td>
<td>Conley Rose</td>
<td>Principal</td>
</tr>
<tr>
<td>Quintero, Alan</td>
<td>Rowan Companies</td>
<td>Sr. Vice President, Business Development</td>
</tr>
<tr>
<td>Ridings, Holly</td>
<td>NASA, Lyndon B. Johnson Space Center</td>
<td>Chief Flight Director</td>
</tr>
<tr>
<td>Roesner, Thomas</td>
<td>Cameron- A Schlumberger Company</td>
<td>Global Business Development Manager</td>
</tr>
<tr>
<td>Sihra, Jaswant</td>
<td>BP-Global Ops</td>
<td>Activity Planning Director</td>
</tr>
<tr>
<td>Simmang, Lance</td>
<td>The Dow Chemical Company</td>
<td>Maintenance Director</td>
</tr>
<tr>
<td>Sims, William</td>
<td>Accent Wire</td>
<td></td>
</tr>
<tr>
<td>Simmons, Robert</td>
<td>Petra Seismic Design Consulting Engineers</td>
<td></td>
</tr>
</tbody>
</table>
Table 7. List of Industry Advisory Council members and their industry affiliations (continued)

<table>
<thead>
<tr>
<th>Name</th>
<th>Company</th>
<th>Title</th>
</tr>
</thead>
<tbody>
<tr>
<td>Smith, Michael</td>
<td>Bell Helicopter Textron</td>
<td>Senior Manager</td>
</tr>
<tr>
<td>Spreen, Scott</td>
<td>Mobile Impact</td>
<td>Partner</td>
</tr>
<tr>
<td>Spicer, John</td>
<td>Breeze Energy LLC</td>
<td>President and Founder</td>
</tr>
<tr>
<td>Taylor, Allan</td>
<td>Wood Group</td>
<td>Office Manager</td>
</tr>
<tr>
<td>Tolles, Robert</td>
<td>Applied Materials, Inc</td>
<td>Managing Director, CMP Products</td>
</tr>
<tr>
<td>Vaughn, Clay</td>
<td>ExxonMobil Development Co.</td>
<td>Retired</td>
</tr>
<tr>
<td>Wall, Larry</td>
<td>NextEra Energy US Producing, LLC</td>
<td>President and COO</td>
</tr>
<tr>
<td>West, Denzil</td>
<td>Reliance Energy, Inc</td>
<td>President and COO</td>
</tr>
<tr>
<td>Young, Gary</td>
<td>Tymco, Inc.</td>
<td>Vice President</td>
</tr>
</tbody>
</table>

3. MECHANICAL ENGINEERING GRADUATE PROGRAM

This chapter summarizes the mechanical engineering graduate program administration and provides details on its operation, starting with a description of the university-level Office of Graduate and Professional Studies (OGAPS). A summary of the graduate degrees currently offered is given next, followed by statistics on the admissions process, financial support, and graduate student enrollment. The demographics of the graduate student body and the peer rankings of the department are provided in the last two sections.

3.1 OFFICE OF GRADUATE AND PROFESSIONAL STUDIES

The Office of Graduate and Professional Studies (OGAPS), under the direction of the Associate Provost of Graduate and Professional Studies, Dr. Butler-Purry, advocates for graduate education at Texas A&M and throughout Texas. OGAPS is committed to a diverse campus climate, enhancement of the graduate experience, and the development of all students as global citizens. OGAPS is responsible for:

1. establishing procedures to guarantee the highest quality educational experience at the graduate level;
2. fostering and facilitating interdisciplinary/intercollegiate graduate programs and research activities; and
3. maintaining and enhancing an environment conducive to creative scholarship and scientific inquiry.

The graduate faculty consists of the President, the Executive Vice President and Provost, the Associate Provosts, the Deans of all subject-matter colleges, selected Directors, and a properly qualified academic group. Members of the graduate faculty participate in the graduate degree programs of the university by serving on student advisory committees and teaching graduate courses. Individuals, regardless of rank, who are not members of the graduate faculty of Texas A&M may not teach graduate courses or serve on student advisory committees unless the OGAPS grants special approval.

The department head initiates nominations for membership on the graduate faculty. The graduate faculty is composed of members, associate members, adjunct members, and special appointments. Members and associate members are selected from qualified individuals of the academic staff of Texas A&M University, from staff of other parts of the university, from the Texas A&M University System, and from affiliated research organizations located in College Station. The adjunct member classification is used for recognized scholars who do not hold a permanent appointment to the faculty of the university, but who otherwise meet the basic requirements for the status of member. Special appointments are temporary appointments to the graduate faculty that allow for the teaching of a single graduate course or for membership on a specific student's advisory committee. The special
appointment does not count towards the minimum number of graduate faculty necessary to form the committee. Almost all full-time faculty members in the department are members of the graduate faculty.

### 3.2 GRADUATE DEGREES

The J. Mike Walker ’66 Department of Mechanical Engineering offers three graduate degrees in mechanical engineering: Master of Engineering, Master of Science, and Doctor of Philosophy. Each of the degree programs are described below.

**Master of Engineering**

The Master of Engineering degree requires a minimum of 30 semester credit hours of approved coursework. Of the required 30 credit hours, 24 must be completed in the mechanical engineering department. This includes mathematics course MEEN 602: Modeling & Analysis of Mechanical Systems. The remaining 6 credit hours of coursework may be selected from any department within the College of Engineering or College of Science. The Master of Engineering program does not require a final report or presentation. Specifics on the curricular requirements for the M.Eng. degree are outlined in Table 8.

The master of engineering program is also available through distance education. The requirements for degree completion are identical to the requirements for students in the on-campus program.

<table>
<thead>
<tr>
<th>Math. Eng. Degree Requirements</th>
<th>Credit Hours (CH)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Courses</td>
<td></td>
</tr>
<tr>
<td>Mathematics</td>
<td>MEEN 602: Modeling &amp; Analysis of Mechanical Systems</td>
</tr>
<tr>
<td>Technical Electives</td>
<td>Any graduate-level MEEN course, Maximum of two courses outside of MEEN but within the College of Engineering or College of Science, May include up to one senior-level undergraduate course</td>
</tr>
<tr>
<td>Total credit hours required for degree</td>
<td>30</td>
</tr>
</tbody>
</table>

**Restrictions:** A combined maximum of 3 credit hours of MEEN 684 & MEEN 685 may be used toward the degree requirements.

**Committee Requirements:** The graduate program director serves as the sole committee member, in the role of committee chair.
**Master of Science**
The Master of Science degree is a research-based, thesis-option degree requiring a total of 32 credit hours. Students must take three credit hours of mathematics, six credit hours of core coursework, 15 credit hours of technical electives, one credit hour of seminar, and seven credit hours of research. Specifics on the curricular requirements for the M.S. degree are outlined in Table 9.

**Table 9. Degree Requirements for the M.S. Program**

<table>
<thead>
<tr>
<th>Curriculum Element</th>
<th>Courses</th>
<th>Credit Hours (CH)</th>
</tr>
</thead>
</table>
| **Mathematics**    | • MEEN 602: Modeling & Analysis of Mechanical Systems *(preferred)*  
• Any graduate-level MATH or STAT course | 3 CH (1 course) |
| **Core Courses**   | • Selected from core course list | 6 CH (2 courses) |
| **Technical Electives** | • Any graduate-level MEEN course  
• Any course within College of Engineering or College of Science departments  
• Minimum of two electives must be in mechanical engineering  
• May include up to one senior-level undergraduate course | 15 CH (5 courses) |
| **Seminar**        | • MEEN 681: Seminar | 1 CH (1 semester) |
| **Research**       | • MEEN 691: Research | 7 CH |
| **Total credit hours required for degree** | **32** |

**Restrictions:** A combined maximum of 4 credit hours of MEEN 684 & MEEN 685 may be used toward the degree requirements.

**Committee Requirements:** Committee chair, plus two committee members. At least one committee member must be a tenure/tenure-track faculty member in MEEN. At least one committee member must be from another department.
Doctor of Philosophy

Students entering the Ph.D. program with a bachelor’s degree must complete 96 credit hours. This includes six credit hours of mathematics coursework, nine credit hours of core coursework, 18-27 credit hours of technical electives, three credit hours of seminar, and 21-30 credit hours of research. Specifics on the curricular requirements for the 96-hour Ph.D. degree are outlined in Table 10.

Table 10. Degree Requirements for the Ph.D. Program for Students Entering with a Bachelor’s Degree

<table>
<thead>
<tr>
<th>Curriculum Element</th>
<th>Courses</th>
<th>Credit Hours (CH)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mathematics</td>
<td>• MEEN 602: Modeling &amp; Analysis of Mechanical Systems</td>
<td>6 CH (2 courses)</td>
</tr>
<tr>
<td></td>
<td>• Any graduate-level MATH or STAT course</td>
<td></td>
</tr>
<tr>
<td>Core Courses</td>
<td>• Selected from core course list</td>
<td>9 CH (3 courses)</td>
</tr>
<tr>
<td>Technical Electives</td>
<td>• Any graduate-level MEEN course</td>
<td>18-27 CH (6-9 courses)</td>
</tr>
<tr>
<td></td>
<td>• Any course within College of Engineering or College of Science</td>
<td></td>
</tr>
<tr>
<td></td>
<td>departments</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Minimum of two electives must be in mechanical engineering</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• May include up to one senior-level undergraduate course</td>
<td></td>
</tr>
<tr>
<td>Seminar</td>
<td>• MEEN 681: Seminar</td>
<td>3 CH (3 semesters)</td>
</tr>
<tr>
<td>Research</td>
<td>• MEEN 691: Research</td>
<td>51-60 CH</td>
</tr>
</tbody>
</table>

| Total credit hours required for degree | 96 |

Restrictions: A combined maximum of 4 credit hours of MEEN 684 & MEEN 685 may be used toward the degree requirements.

Committee Requirements: Committee chair, plus three committee members. At least one committee member must be a tenure/tenure-track faculty member in MEEN. At least one committee member must be from another department.

Students entering the Ph.D. program with a master’s degree must complete 64 credit hours. This includes three credit hours of mathematics coursework, three credit hours of core coursework, 12 credit hours of technical electives, two credit hours of seminar, and 44 credit hours of research. Specifics on the curricular requirements for the 64-hour Ph.D. degree are outlined in Table 11.
Table 1. Degree Requirements for the Ph.D. Program for Students Entering with a Master’s Degree

<table>
<thead>
<tr>
<th>Curriculum Element</th>
<th>Courses</th>
<th>Credit Hours (CH)</th>
</tr>
</thead>
</table>
| Mathematics        | • MEEN 602: Modeling & Analysis of Mechanical Systems *(preferred)*  
                    • Any graduate-level MATH or STAT course | 3 CH (1 course) |
| Core Courses       | • Selected from core course list | 3 CH (1 course) |
| Technical Electives| • Any graduate-level MEEN course  
                    • Any course within College of Engineering or College of Science departments  
                    • Minimum of one elective must be in mechanical engineering  
                    • May include up to one senior-level undergraduate course | 12 CH (4 courses) |
| Seminar            | • MEEN 681: Seminar | 2 CH (2 semesters) |
| Research           | • MEEN 691: Research | 44 CH |

**Total credit hours required for degree**: 64

**Restrictions**: A combined maximum of 4 credit hours of MEEN 684 & MEEN 685 may be used toward the degree requirements.

**Committee Requirements**: Committee chair, plus three committee members. At least one committee member must be a tenure/tenure-track faculty member in MEEN. At least one committee member must be from another department.

Examinations for the Ph.D. program

*Ph.D. Qualifying Exam*

Ph.D. students are required to pass the qualifying examination in order to continue in the doctoral program. The purpose of this exam is to ensure students pursuing a doctoral degree have a graduate-level understanding of undergraduate mechanical engineering fundamentals.

The qualifying exam is a single closed-book, written exam covering seven fundamental mechanical engineering subject areas: controls, design, dynamics, fluid mechanics, heat transfer, solid mechanics, and thermodynamics. The exam consists of two problems in each subject area for a total of fourteen problems. Students select any four problems to answer and have a maximum of four hours to complete the exam. To pass the qualifying exam, students must earn a score of 65 or higher.

The first attempt at the qualifying examination must be completed at the beginning of the student’s second long (fall or spring) semester. Students in the 96-hour program have three attempts to earn a passing score, and students in the 64-hour program have two attempts to earn a passing score. If a student fails the exam on the first attempt, they must make their second attempt at the exam in the following long semester. Appendix C includes detailed information on the Ph.D. qualifying exam process.

*Ph.D. Preliminary Exam and Research Proposal Defense*

All Ph.D. students are required to complete a preliminary exam to assess a student’s knowledge of their research topic. This oral examination is administered by the student’s advisory committee and there is not a department-required format of the exam. Per the preliminary exam guidelines set forth by the Office of Graduate and
Professional Studies, students must be in good academic standing (GPA of 3.0 or higher) and be within six hours of completing coursework requirements for their degree in order to complete the preliminary exam.

As a method of monitoring student progress to degree completion, the department requires 96-hour Ph.D. students to complete the preliminary exam no later than the 6th long semester of study and 64-hour Ph.D. students to complete the preliminary exam no later than the 4th long semester of study.

Upon approval of the student’s examination committee, with no more than one member dissenting, and approval of the Office of Graduate and Professional Studies, a student who has failed the preliminary examination may be given one re-examination. The student will be given adequate time to address the inadequacies emerging from the first preliminary examination. The examination committee must agree upon and communicate in writing to the student, an adequate time-frame from the first examination (normally six months) to retest, as well as a detailed explanation of the inadequacies emerging from the examination.

Ph.D. Final Exam and Dissertation Defense
All Ph.D. students must pass a final examination by deadline dates announced in the “Office of Graduate and Professional Studies Calendar” each semester. The doctoral student is allowed only one opportunity to take the final examination. This final examination is administered by the student’s advisory committee. A positive vote by all members of the graduate committee with at most one dissension is required to pass a student on his or her exam.

3.3 GRADUATE COURSES

The courses in mechanical engineering department include core courses, technical elective courses, and graduate seminar. Additionally, individual faculty can request to offer special topics courses related to emerging research topics.

Core Courses
All M.S. and Ph.D. students are required to enroll in what the department has designated as core courses. This list has changed over time. Namely, MSEN 601: Fundamental Materials Science and Engineering was removed from the core course list in fall 2016, and five mechanical engineering courses were added to the core course list in fall 2019. Core courses added in fall 2019 are noted with an asterisk (*).

Design methodology, functional design, innovation, parameter analysis, design for reliability, manufacturability and strength; design project.

Analysis of stress and strain in two and three dimensions, equilibrium and compatibility equations, strain energy methods; torsion of noncircular sections; flexure; axially symmetric problems.

Development of field equations for analysis of continua (solids as well as fluids); conservation laws: kinematics, constitutive behavior of solids and fluids; applications to aerospace engineering problems involving solids and fluids.

Forward and inverse kinematics and differential kinematics of robot manipulators, path planning, motion planning, dynamics of robot manipulators, control algorithms; PD/PID control, computed torque algorithm, robust and adaptive control algorithms, feedback linearization.
MEEN 613. Engineering Dynamics. (3-0). Credits 3.
Three dimensional study of dynamics of particles and rigid bodies and application to engineering problems; introduction to Lagrange equations of motion and Hamilton's principle.

MEEN 615. Advanced Engineering Thermodynamics. (3-0). Credits 3.
Theories of thermodynamics and their application to more involved problems in engineering practice and design; equilibrium, Gibbs' function, nonideal gases and various equations of state; second law analysis and statistical theory.

MEEN 617. Mechanical Vibrations. (3-0). Credits 3.

Dynamics of two-dimensional incompressible and compressible fluids; viscous flow in laminar and turbulent layers, the Navier-Stokes equations and boundary layer theory.

Examination of deformation and microstructure mechanisms responsible for deformation and failure in metals; fatigue, creep, and fracture mechanisms of materials; emphasis on microstructural-mechanical property relationship.

Application of basic laws to the analysis of heat and mass transfer; exact and approximate solutions to conduction, convection and radiation problems; current status of single and two-phase heat transfer for application to design.

Frequency domain design of SISO systems for performance and sensitivity reduction; applications of Kalman filter and LQG/LTR techniques; design of sample-data systems; active control of vibration in distributed parameter systems; describing function and relay controls; application of control principles to engineering design.

*MEEN 672. Introduction to Finite Element Method. (3-0) Credits 3.
Weak or variational formulation of differential equations governing one- and two-dimensional problems of engineering; finite element model development and analysis of standard problems of solid mechanics (bars, beams, and plane elasticity), heat transfer and fluid mechanics; time-dependent problems; computer implementation and use of simple finite element codes in solving engineering problems.

Overview of principles, methods and tools in multidisciplinary system analysis and design optimization; engineering systems modeling for analysis, design and optimization; design variable selection, objective functions and constraints; subsystem identification and interface design; gradient-based and heuristic search methods; multi-objective optimization and Pareto optimality.

Derive approximate solutions of engineering mechanics problems by using suitable assumptions; understand the nature of the approximations and their effects on the accuracy of the resulting mechanics-of-materials solutions; apply the principles of advanced mechanics of materials to analyze deformation and failure problems common in engineering design and materials science; prepare for success in more advanced mechanics courses such as elasticity, energy methods, continuum mechanics and plasticity.
**Technical Electives**

The mechanical engineering has 57 technical elective courses in the course catalog. These courses are taught on a relatively regular schedule. In addition to these courses, faculty can propose special topics courses, numbered MEEN 689. Special topics courses can be given a permanent course number if a long-term need is seen for the material covered in the course. Since 2013, 17 special topics courses have become permanent courses, indicated by italicized course titles. A list of special topics courses from 2013-2019 is presented in Table 12. Abbreviated syllabi for all mechanical engineering courses are available in Appendix D.

<table>
<thead>
<tr>
<th>Course Title</th>
<th>Permanent Course Number</th>
</tr>
</thead>
<tbody>
<tr>
<td>Advanced Internal Combustion Engines</td>
<td>MEEN 611</td>
</tr>
<tr>
<td>Alternative Energy Conversion</td>
<td>MEEN 669</td>
</tr>
<tr>
<td>Applied Computation Fluid Dynamics</td>
<td></td>
</tr>
<tr>
<td>Applied Finite Element Analysis</td>
<td></td>
</tr>
<tr>
<td>Architectures for Autonomous Vehicles</td>
<td></td>
</tr>
<tr>
<td>Bio-inspired Engineering Design</td>
<td>MEEN 696 (effective fall 2020)</td>
</tr>
<tr>
<td>Comparative Biomechanics</td>
<td>MEEN 694</td>
</tr>
<tr>
<td>Compressible Flow</td>
<td>MEEN 670</td>
</tr>
<tr>
<td>Computational Fluid Dynamics</td>
<td></td>
</tr>
<tr>
<td>Continuum Thermodynamics</td>
<td></td>
</tr>
<tr>
<td>Convex Optimization Methods for Control Applications</td>
<td></td>
</tr>
<tr>
<td>Corrosion Engineering</td>
<td>MEEN 660</td>
</tr>
<tr>
<td>Custom Manufacturing</td>
<td>MEEN 687</td>
</tr>
<tr>
<td>Design and Control of Smart Structures</td>
<td></td>
</tr>
<tr>
<td>Developing an Innovation Mindset</td>
<td></td>
</tr>
<tr>
<td>Engineering Applications in Solid Mechanics</td>
<td></td>
</tr>
<tr>
<td>Entrepreneurship in Nano and Energy Systems</td>
<td>MEEN 690 (pending approval)</td>
</tr>
<tr>
<td>Fundamentals of Energy Storage</td>
<td></td>
</tr>
<tr>
<td>Gas Dynamics</td>
<td>MEEN 605</td>
</tr>
<tr>
<td>Kinetic Processes in Material Science</td>
<td>MEEN 645</td>
</tr>
<tr>
<td>Mechanics of Soft Solids</td>
<td></td>
</tr>
<tr>
<td>Modeling &amp; Analysis of Mechanical Systems</td>
<td>MEEN 602</td>
</tr>
<tr>
<td>Model-Based Design</td>
<td></td>
</tr>
<tr>
<td>Multidisciplinary System Analysis and Design Optimization</td>
<td>MEEN 683</td>
</tr>
<tr>
<td>Nano-Scale Phenomena in Polymers</td>
<td></td>
</tr>
<tr>
<td>Nonlinear Elasticity</td>
<td>MEEN 603</td>
</tr>
<tr>
<td>Plasma Engineering and Applications</td>
<td></td>
</tr>
<tr>
<td>Precision Machine Tools</td>
<td></td>
</tr>
<tr>
<td>Solar Energy Engineering</td>
<td>MEEN 693</td>
</tr>
<tr>
<td>Solid Mechanics</td>
<td></td>
</tr>
<tr>
<td>Tensor Analysis</td>
<td>MEEN 623</td>
</tr>
<tr>
<td>Time Frequency Nonlinear Vibration Control</td>
<td>MEEN 604</td>
</tr>
<tr>
<td>Tribology</td>
<td>MEEN 654</td>
</tr>
</tbody>
</table>
Graduate Seminar Series
Once per week during the fall and spring semesters, the department holds a 50-minute seminar. This seminar is also listed in the graduate catalog as course MEEN 681. The seminar series brings in nationally recognized scholars and established researchers to share their current research activities. The purpose is to expose students to a breadth of knowledge within mechanical engineering, complementing the knowledge gained from their graduate study. Most of the speakers come from outside the university and include department heads and chairs, as well as researchers from academia, government laboratories, and industry. Once per semester there is a Distinguished Fowler Lecture that is sponsored by an endowment from the Fowler brothers, Don and Joe, both graduates of Texas A&M University. The Turbomachinery Distinguished Lecture Series was established in 2014. With this endowment, the department invites prominent speakers in the area of turbomachinery to present lectures of interest to students and faculty. The Walker Eminent Lecture Series, initiated in 2019, is endowed by Dr. J. Mike Walker ’66. This endowment allows the department to invite nationally recognized scientists, engineers, and researchers to present lectures of interest to students and faculty. Appendix B lists the seminar speakers for 2013-2019.

3.4 GRADUATE ADMISSION

Admission to the mechanical engineering graduate program is very competitive. Each fall semester, the graduate program director, in consultation with the departmental Graduate Studies and Research Committee (GSRC) sets admission criteria for the following spring and fall semesters. The department competes with peer institutions to attract qualified domestic students. In general, the admission criteria include undergraduate performance, undergraduate school of graduation, GRE scores, TOEFL score (if applicable), letters of recommendation, work experience, whether or not they are a Texas A&M undergraduate student, and other meritorious recognition (e.g. Fulbright fellowship).

Application, Criteria, Evaluation, and Selection Procedures
Applicants to the MEEN graduate program submit applications through EngineeringCAS, a common application system. The deadline for fall admission is March 1 of the preceding spring semester for international applicants and April 1 of the preceding spring semester for U.S. applicants. The deadline for spring admission is September 1 of the preceding fall semester for international applicants and October 1 of the preceding fall semester for U.S. applicants. Summer admission is only granted for M.S. and Ph.D. students who have already identified a research advisor and wish to begin their research prior to the start of the fall semester to which they were admitted.

Required Materials for a Complete Application
- EngineeringCAS online application
- Statement of purpose detailing why a student is interested in pursuing the selected graduate degree, why they are interested in doing this at Texas A&M, and their research area of interest, if applicable
- Transcripts of all previously attended institutions of higher education
- GRE scores
- TOEFL or IELTS scores (if from a country in which English is not the primary language); this requirement is waived if a student has a GRE-V score of 146 or higher
- 3 letters of recommendation
- Resume/CV
- Application fee

English Proficiency Requirement
Per university policy, international applicants must be English Language Verified prior to receiving an I-20. To attain English Language Verification, a student must have received one of the following scores prior to admission:
minimum GRE verbal score of 146; minimum TOEFL score of 80 internet-based testing (i-BT); minimum IELTS score of 6.0 overall band; minimum PTE academic score of 53; or satisfy alternative criteria described on the Office of Graduate and Professional Studies website.

Admissions Process
All applications go through a minimum of two rounds of review. The initial review is conducted by the departmental academic advisor by summarizing the strengths and weaknesses of each applicant, followed by a secondary review from departmental faculty who provide their input. During the secondary review, a minimum of three faculty members are asked to review and score each Ph.D. application. The average score is used to make the admission decision. Final admission decisions are reviewed and approved by the graduate program director.

Admission decisions are based on degree appropriateness, grade point average, quality of institution(s) from which an applicant holds degree(s), and technical interest and expertise as it aligns to departmental needs. Also, evidence of future success as a technical leader is considered as evidenced by publications or similar scholarly activity. Similarly, evidence of future success as an institutional or societal leader as evidenced by leadership in student organizations or similar is also considered. In cases in which the applicant speaks English as a second language, TOEFL scores or similar evidence of the ability to be successful in courses taught in English is considered. GRE scores are also noted. Students with superior academic records are considered for departmental funding in the form of teaching assistantships and fellowships. Funding priority is given to Ph.D. students. Students receiving research assistant offers from a faculty member may receive additional fellowship funds from the department. Multi-year funding packages are offered to top admits.

Figure 4 shows the history of graduate students who have applied, been admitted, and enrolled in mechanical engineering since 2013. The number of applications has been above or close to 1,000, since 2013. In recent years, application numbers have declined. This has been seen across the country, with the most noticeable decline being from international applicants. Admission rates vary between 16-45% (see Figure 5), and the enrollment rates vary between 35-55% (Figure 6). There are three major reasons that account for the increased admission rate in the recent couple of years: (1) the recent expansion of the master’s programs (M.S. and M.Eng.) resulted in more master’s admissions, (2) to maintain or increase the graduate population of our department, the same number of students, as in the previous years were admitted, which inevitably led to a higher admission rate given the decreased total number of applications, and (3) the leadership in the graduate program office changed since 2018 and a different set of strategies of admission was applied. Now that there is an awareness of the increased admission rates, the graduate office is implementing strategies to lower the admission rate. These strategies include increasing the total number of applications by more aggressive advertisement of the graduate program and by lowering the application fees, and adjusting admission criteria especially for master’s applications. The goal is to control the admission rate back to the range 25-30%. Figures 7 and 8 shows the histories of Ph.D. and master student application, admittance, and enrollment in mechanical engineering since 2013.
Figure 4. Historical number of applications received, students admitted, and students enrolled

Figure 5. Historical rate of graduate admission
Figure 6. Historical rate of student matriculation

Figure 7. Historical rate of Ph.D. student application, admittance, and enrollment
3.5 GRADUATE STUDENT ENROLLMENT

Total graduate student enrollment in the mechanical engineering department has been above 400 since about 2013. As shown in Figure 9, there has been a steady increase in enrollment over the past seven years. The number of Ph.D. students remains relatively the same, but the number of master’s students has increased significantly. Enrollment in the M.Eng. program has contributed to the significant increase in the number of master’s students, while the number of M.S. students remains relatively the same. Figure 10 shows master degree enrollment, which includes M.S., M.Eng., and Distance Learning (DL) M.Eng.
Figure 9. Mechanical engineering master’s degree enrollment by degree type
(source: https://accountability.tamu.edu/All-Metrics/Mixed-Metrics/Student-Demographics)

Figure 10. Mechanical engineering graduate enrollment by degree level
(source: https://accountability.tamu.edu/All-Metrics/Mixed-Metrics/Student-Demographics)
In fall 2019, the mechanical engineering graduate program reached enrollment of 498 students. This is the highest enrollment in the department’s history. There are 254 Ph.D. students, 144 M.S. students, and 100 M.Eng. students. Domestic Ph.D. enrollment is at the highest percentage that the department has seen in the last seven years, coming in at 31%. However, the overall percentage of domestic students has remained stagnant because of an increase in international enrollment in the master’s programs.

Current female enrollment is 12.9% and has not changed significantly since 2015. Enrollment of underrepresented minorities has decreased slightly in the last two years – currently 5.6% (28 students). To increase these numbers, a funding model targeting female and underrepresented minority students has been developed, and implementation started in 2019.

**Student Demographics and Diversity**

It is a continuing struggle to improve the number of domestic, female, and minority students in the graduate program at Texas A&M, and efforts in this regard are continually being assessed and improved. As shown in Figure 11, the number of underrepresented minority enrollment remains about the same. Similarly, the relative number of minority graduate students in the department (African American, Hispanic, and Native American) has not changed much over the past seven years, less than eight percent of students in the department, as shown in Figure 12. Female graduate student enrollment has slightly dropped since the last program review, but has remained fairly constant since 2015, as shown in Figure 13. Figure 14 plots these same data in terms of percentage of the graduate student enrollment. Over the past few years, the mechanical engineering graduate program has remained between 12-17% female.

![Underrepresented Minority Enrollment](image-url)

*Figure 11. Number of underrepresented minority students enrolled in the mechanical engineering graduate program*
Figure 12. Underrepresented minority enrollment in percentage

Figure 13. Female student enrollment in the ME graduate program at TAMU through the years
Regarding the number of domestic students enrolled in the graduate program, the average since 2013 has been about 35%. Figures 15 and 16 show the statistics over a seven-year period, to 2019, for master’s and Ph.D. students, respectively. The overall percentage of domestic students enrolled in the mechanical engineering graduate program is shown in Figure 17. The number of domestic master’s students has dropped significantly in the past four years, but the number of domestic Ph.D. students has increased quite significantly. Although the department strives for these numbers to be higher, it is nonetheless much greater than the percentage of domestic students that have applied to the program in recent years.
Figure 15. Domestic and international student enrollment in master’s program (M.S. and M.Eng.)

Figure 16. Domestic and international student enrollment in Ph.D. program
This section presents retention and graduation rates of master’s and Ph.D. students in the mechanical engineering department. Additionally, information on degrees awarded and average time to degree in the department is included. On average, master’s students take less than 2.5 years to complete their studies, while graduation time of Ph.D. students is approximately six years.

Retention and graduation rates are calculated by looking at the department and degree a student was admitted under and determining if they graduated from the same department. These numbers do not tell whether a student remained in the same degree program to which they were admitted. For instance, a student admitted to the Ph.D. program in mechanical engineering who later switched to pursue a M.S. in the same department is still considered retained or graduated within the department and is calculated under the Ph.D. data. Tables 13 and 14 present retention and graduation rates for master’s and Ph.D. students in the mechanical engineering department. Referring to Table 13, the retention for master’s students has remained relatively high, and in recent years the department has seen an increase in the student graduation within two years into the program. For the Ph.D. program, as shown in Table 14, first-year retention rates in the past ten years have been above 80%. However, between years one and three a significant number of students leave the Ph.D. program. While the department has not tracked qualitative data to identify the reasons students leave the Ph.D. program, steps are being taken to address what have been identified as potential reasons for the losses. The qualifying exam is taken in a student’s first academic year, with the final attempt being in the 2nd academic year. Students who do not pass the exam are required to complete a master’s degree, or pursue their graduate studies in another department. Each year the graduate program loses students due to failure of the qualifying exam. To achieve higher pass rates on the qualifying exam, the graduate office began facilitating qualifying exam study groups in 2018. Additionally, qualifying exam student panels have been held each semester for students who have already successfully

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**Figure 17. Percent domestic and international student enrollment in graduate program (Ph.D. and masters)**

**3.6 MECHANICAL ENGINEERING GRADUATE DEGREE STATISTICS**
completed this degree requirement to share their tips and strategies for exam preparation. In addition to challenges on the qualifying exam, students seem to need additional guidance on course selection and finding a research advisor. Students who are unable to find a research advisor within the first calendar year of their Ph.D. program are required to level down to the Master of Engineering program. The graduate office is developing workshops to assist students with advisor identification and course selection. Included in this initiative is identifying courses based on general research areas so students can make more informed decisions when registering for classes. Lastly, students who are in teaching assistant (TA) positions in their first year of the graduate program have difficulty balancing the workload of coursework, TA responsibilities, and, in many cases, research. The department seeks to increase fellowship funding for the first year so students can focus on coursework, preparation for the qualifying exam, and identifying a research advisor.

While retention is an area that needs improvement, graduation rates are also in need of improvement. The graduate office has begun meeting with students who have not graduated within five years of beginning their Ph.D. to develop individualized graduation plans. Faculty advisors are involved in this process. The graduate office staff is also readily available for students who are questioning their decision to pursue a Ph.D. Additionally, the academic enhancements described in section 3.8 are also aimed at improving retention and graduation rates among all graduate students in mechanical engineering.

Table 13. Retention and graduation rates of master’s students in mechanical engineering

<table>
<thead>
<tr>
<th>Year</th>
<th>Cohort Count</th>
<th>1-Yr % Ret.</th>
<th>1-Yr % Grad.</th>
<th>2-Yr % Ret.</th>
<th>2-Yr % Grad.</th>
<th>3-Yr % Ret.</th>
<th>3-Yr % Grad.</th>
<th>4-Yr % Ret.</th>
<th>4-Yr % Grad.</th>
</tr>
</thead>
<tbody>
<tr>
<td>2013</td>
<td>65</td>
<td>95%</td>
<td></td>
<td>62%</td>
<td>34%</td>
<td>8%</td>
<td>88%</td>
<td>5%</td>
<td>89%</td>
</tr>
<tr>
<td>2014</td>
<td>65</td>
<td>88%</td>
<td>2%</td>
<td>54%</td>
<td>34%</td>
<td>20%</td>
<td>69%</td>
<td>12%</td>
<td>75%</td>
</tr>
<tr>
<td>2015</td>
<td>85</td>
<td>93%</td>
<td>4%</td>
<td>42%</td>
<td>53%</td>
<td>9%</td>
<td>86%</td>
<td>7%</td>
<td>88%</td>
</tr>
<tr>
<td>2016</td>
<td>96</td>
<td>91%</td>
<td>2%</td>
<td>31%</td>
<td>60%</td>
<td>6%</td>
<td>84%</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2017</td>
<td>103</td>
<td>90%</td>
<td></td>
<td>27%</td>
<td>57%</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2018</td>
<td>81</td>
<td>91%</td>
<td>5%</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Table 14. Retention and graduation rates of Ph.D. students in mechanical engineering

<table>
<thead>
<tr>
<th>Year</th>
<th>Cohort Count</th>
<th>1-Yr % Ret.</th>
<th>1-Yr % Grad.</th>
<th>3-Yr % Ret.</th>
<th>3-Yr % Grad.</th>
<th>5-Yr % Ret.</th>
<th>5-Yr % Grad.</th>
<th>7-Yr % Ret.</th>
<th>7-Yr % Grad.</th>
</tr>
</thead>
<tbody>
<tr>
<td>2008</td>
<td>29</td>
<td>90%</td>
<td></td>
<td>48%</td>
<td>10%</td>
<td>21%</td>
<td>41%</td>
<td>7%</td>
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</tr>
<tr>
<td>2009</td>
<td>73</td>
<td>86%</td>
<td></td>
<td>55%</td>
<td>18%</td>
<td>26%</td>
<td>47%</td>
<td>7%</td>
<td>64%</td>
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<tr>
<td>2010</td>
<td>76</td>
<td>82%</td>
<td></td>
<td>45%</td>
<td>14%</td>
<td>18%</td>
<td>38%</td>
<td>8%</td>
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</tr>
<tr>
<td>2011</td>
<td>70</td>
<td>84%</td>
<td></td>
<td>54%</td>
<td>14%</td>
<td>20%</td>
<td>46%</td>
<td>11%</td>
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<tr>
<td>2012</td>
<td>71</td>
<td>82%</td>
<td></td>
<td>52%</td>
<td>6%</td>
<td>15%</td>
<td>39%</td>
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<td>54%</td>
</tr>
<tr>
<td>2013</td>
<td>70</td>
<td>91%</td>
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<td>71%</td>
<td>3%</td>
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<td>2014</td>
<td>53</td>
<td>91%</td>
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<td>74%</td>
<td>2%</td>
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<tr>
<td>2015</td>
<td>51</td>
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<td>71%</td>
<td>2%</td>
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<tr>
<td>2016</td>
<td>42</td>
<td>86%</td>
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<td>60%</td>
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<td>2017</td>
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<tr>
<td>2018</td>
<td>68</td>
<td>87%</td>
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</table>

Figure 18 presents the total number of mechanical engineering graduate degrees awarded from the 2013-14 academic year through the 2018-19 academic year. The total number of degrees ranged from a low of 103 during the 2013-14 year to a high of 147 in the 2016-17 year. While there is some variation from year to year, the number of M.S. and Ph.D. degrees awarded each year remains about the same, but a significant increase in the number of
M.Eng. degree awarded. The numbers of degrees awarded to female and minority students are reported in Figure 19 and Figure 20, respectively. The number of degrees awarded to female and minority students has remained steady over the past six years. Finally, the percentage of degrees awarded to international students are shown in Figure 21.

Figure 18. Graduate degrees awarded 2013-2019
Figure 19. Graduate degree awarded for female students

Figure 20. Mechanical engineering degrees awarded to underrepresented minority students
Figure 21. Percentage of mechanical engineering degrees awarded to international students

Figure 22 presents the average time to degree in the mechanical engineering from the 2013-14 academic year through the 2018-19 academic year. Note: 1) the numbers are calculated by the university office, Data and Research Services. They count fall + spring as 1 year. Therefore, if a student goes beyond the 2 semesters, their time to degree increases even if they have not completed one full calendar year; 2) in 2017-2018 the department worked to graduate students who had been in the program for an extensive period of time. As anticipated, this effort increased time to degree during the associated period.
3.7 ASSESSMENT OF STUDENT LEARNING OUTCOMES

The department implemented a portfolio requirement for assessment purposes in fall 2015. The portfolio is a collection of a student’s work, demonstrating how they have met each departmental learning outcome. Portfolios for M.Eng. students are reviewed by members of the Graduate Studies and Research Committee (GSRC). Based on the content provided, the committee member completes an assessment rubric, marking whether the student exceeded expectations, met expectations, or was below expectations for each learning outcome. Portfolios for M.S. and Ph.D. students require an assessment rubric by the research committee, again marking whether the student exceeded expectations, met expectations, or was below expectations for each learning outcome. Additionally, all students are required to complete a self-assessment rubric. The assessment rubric can be found in Appendix G.

3.8 SUMMARY OF ACADEMIC ENHANCEMENTS

In summary, the department has considered many activities in order to improve the quality of graduate students and the overall graduate student experience in mechanical engineering. Over the past seven years, there have been significant changes in the core courses, degree requirements, and the department has offered several new courses. The number of endowments and graduate fellowships have increased significantly. In summer 2019, the department started offering a graduate summer research grant, which encourages graduate students to write short proposals for exploring new research ideas within their interests. The department has also provided travel funds for graduate students to attend conferences. The seminar series have improved significantly by adding several distinguished lectures per semester (see Appendix B), in addition to seminars and workshops organized by the Mechanical Engineering Graduate Student Organization (MEGSO). The mechanical engineering department has several awards, i.e., Walker Impact Awards and James J. Cain Awards, for honoring outstanding graduate
students. Finally, through the graduate program fee and graduate teaching fellows program, additional fellowship and training opportunities are available to graduate students.

**Travel Fund**
This year, the department awarded $50,000 travel funds to graduate students (both master’s and Ph.D.). Ph.D. students receive up to $750 and M.S. students receive up to $500, which can be used for conference registration, costs for transportation and lodging. The priority of travel funds is given to students who already have their papers accepted in the conferences and who during the same fiscal year has not yet received any travel funds.

**Mechanical Engineering Graduate Student Awards**
Every year, the J. Mike Walker ’66 Department of Mechanical Engineering presents graduate student awards, which are the Walker Impact Awards and James J. Cain Outstanding Student Awards. These awards are open to all graduate students in the department, however, students can apply for only one award. These awards are evaluated comprehensively and awarded competitively.

**Walker Impact Awards ($5000/student):** This award is given to two male and two female graduate students in the department of mechanical engineering. In alignment with the core pillars of the academy, students should demonstrate involvement in research, teaching, and/or service. Related experience such as entrepreneurial, internship, leadership, and/or professional development experience will be considered. The application package includes curriculum vitae, a faculty letter of recommendation, and the student’s narrative on the impact of his/her work to the field, industry, and visibility of the department.

**James J. Cain Awards ($2500/student):** This award is given to one male and one female graduate student in the department of mechanical engineering. In alignment with the core pillars of the academy, students should demonstrate involvement in research, teaching, and/or service. Related experience such as entrepreneurial, internship, leadership, and/or professional development experience will be considered. The application package includes curriculum vitae, a faculty letter of recommendation, and the student’s narrative discussion how his/her graduate work has made a unique contribution to the department, particular field, and/or society at-large.

**Graduate Program Fees**
The College of Engineering instituted the engineering graduate program fee of $145 per semester credit hour (SCH) in fall 2018, rising to $285 per SCH starting in fall 2019. It is charged on the first nine SCH each in fall and spring semesters and on the first six SCH during the summer semester. It is charged for both engineering and non-engineering graduate courses, with all incoming fees being returned to the College of Engineering (COE), which in turn will distribute the funds to the individual COE departments based on a predetermined formula that is in proportion to the graduate student enrollment and graduate semester credit hours generated by each department. The funds returned to the department are used to enhance the graduate students’ academic and research experience at Texas A&M. A college-level Graduate Program Fee Oversight Committee (GPFOC) consisting of faculty representatives from all departments and impacted academic units, other pertinent university personnel, graduate student representatives, and the dean of engineering or designee oversees allocation of graduate program fee revenue and approves departmental and academic unit plans for use of fee revenue.

The Graduate Studies and Research Committee (GSRC) in MEEN, a departmental committee consisting of the graduate program director, faculty members, and graduate student representatives, which reports to the department head, is responsible for getting input from faculty and students, developing procedures and yearly budget for the use of the fee, monitoring spending, reporting to the faculty and students, collecting feedback, submitting an annual report of fee utilization to COE, and proposing adjustments to the plans for the following year that address evolving departmental needs. The student representatives are selected from the elected members of the Mechanical Engineering Graduate Student Organization (MEGSO).
The GPF funds allocated to MEEN department are $350,000 in FY 18-19 and $600,000 in FY 19-20. They are used to support the following:

- **Graduate student fellowships:** The GPFs complement existing departmental fellowships to (1) recruit top Ph.D. students (especially domestic students), underrepresented minorities and female graduate students and (2) encourage current outstanding graduate students to achieve greater success in academic and research performance.
- **Graduate Teaching Fellow:** The GPFs complement the existing College of Engineering Graduate Teaching Fellow program by supporting more doctoral students to pursue academic careers through mentored teaching experience. Details of this program can be found in the next section.
- **Graduate student travel grants:** Support students presenting research and technical projects at professional conferences. PhD students receive up to $750 and MS students $500 per year; remaining expenses are supported by the research advisor.
- **New graduate student recruiting and orientation events.**
- **MEGSO and graduate student professional development activities including graduate seminars, workshops, networking, career consulting, research symposia, poster competitions, etc.**
- **Upgrade graduate student office space and shared equipment/software/hardware/facilities (including 3D print studio and machine shop) for graduate student research and training (to directly benefit graduate students).**
- **New research initiatives with a focus on interdisciplinary research and new/high demand research areas.** Two initiatives have been implemented: (1) MEEN Research Priming Seed Grant Program that fosters faculty collaboration within MEEN and sustains innovative research and high impact scholarship; and (2) Graduate Student Summer Research Grant that aims to support innovative research ideas developed by graduate students, train graduate students in grant proposal writing and research planning, and advance graduate students’ career development.
- **Partial support of staff who provide direct support to all graduate student activities.**
- **Other evolving graduate student and program needs.**

**Graduate Teaching Fellows Program**

The purpose of the College of Engineering Graduate Teaching Fellowship (GTF) program is to encourage, prepare, and educate doctoral students to pursue academic careers. The GTF is not a conventional teaching assistant position. This competitive program provides selected students with a supervised, mentored teaching experience to help them compete for faculty positions at top tier universities. Engineering faculty positions at the rank of assistant professor require a new faculty member to find a balance between teaching excellence, establishment of independent research record, and service to the profession. Teaching Fellows are expected to actively continue their doctoral research and professional activities during this appointment to gain experience in balancing these responsibilities.

Tenured or tenure-track faculty are eligible to nominate students for the GTF position and serve as mentors. A graduate student can also self-nominate. However, self-nominees must find a faculty member who is willing to mentor them. The mentor does not have to be the student’s thesis advisor but the advisor’s consent is highly desirable.

The appointment as a Teaching Fellow is typically limited to two semesters. However, if a Fellow has performed at an extraordinary level as evidenced by their teaching evaluations, if they receive a very strong recommendation from their mentor, and they have demonstrated a strong desire to join academia, the Fellow may be considered for a third term. A student cannot be a Fellow for four terms under any circumstances.
The Fellow will receive support of $2,100 per month, tuition, and benefits, cost-shared by the college and department. The mechanical engineering department pays the fees. Upon selection, the mentor will be expected to sign a mentoring agreement. At the successful conclusion of this appointment, the student will receive a certificate from the vice chancellor and dean of engineering indicating that they were the “instructor of record” for the course.

The mechanical engineering department participates in the GTF program and has one to three fellows each semester. Table 15 shows number of teaching fellows from 2013-2019.

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<tr>
<th>Year</th>
<th>Number of GTFs</th>
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<td>2013-2014</td>
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<td>2014-2015</td>
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<td>2015-2016</td>
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<td>2016-2017</td>
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<td>2017-2018</td>
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<td>2018-2019</td>
<td>7</td>
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<tr>
<td>2019-2020</td>
<td>3</td>
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4. RESEARCH IN MECHANICAL ENGINEERING

The J. Mike Walker ’66 Department of Mechanical Engineering at Texas A&M University is research active in many emerging and traditional areas. This chapter provides details on the breadth and size of the research activities in mechanical engineering over the past eight years. Provided first is an overview of faculty expertise and a summary specific research expertise contained within the department. Following that is an overview of the center level research laboratories directed by department faculty and with significant department faculty participation. Further details on individual principal investigators, recent grants, and journal citations are provided through the faculty biographies provided in Appendix A.

Research activities within the J. Mike Walker ’66 Department of Mechanical Engineering cover a wide range of topics, and many of them are highly multidisciplinary and represent emerging or non-traditional mechanical engineering areas. Table 16 displays faculty research expertise organized by two classification schemes. One classification scheme is the fundamental areas of knowledge discovery and creation. The second classification scheme is the targeted application field of societal impact. The two schemes are combined in a matrix like format to allow rapid identification of detailed faculty expertise.

Table 16. Research Cluster Matrix

<table>
<thead>
<tr>
<th>Fundamental Areas</th>
<th>ENERGY &amp; ENVIRONMENT</th>
<th>MICRO &amp; NANOSYSTEMS</th>
<th>ADVANCED MANUFACTURING</th>
<th>BIOMECHANICS, HUMAN HEALTH</th>
<th>ROTATING MACHINERY</th>
<th>ROBOTICS &amp; AUTONOMY</th>
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<td>MICRO &amp; NANOSYSTEMS</td>
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<td>ROTATING MACHINERY</td>
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Table 16. Research Cluster Matrix (continued)

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56 | Page
Figure 23 shows a heat plot of the faculty research areas. Faculty self-select as many research areas and fields of application they feel their research program aligns with. As can be seen, a large number of faculty work in energy & environment, with the fewest faculty working in rotating machinery.
4.1 RESEARCH AREAS

Brief descriptions of the broader research categories are presented in this section. The topics described here are not intended to be a complete list of all research activities, but rather to give the reader an idea of the ongoing work and capabilities within the department. The reader is encouraged to visit the mechanical engineering department website and from there to links to the research group websites of individual faculty members for more detailed information on research activities.

Energy Conversion and Combustion
The department continues to grow expertise in traditional energy conversion and combustion strengths such as modeling engine and combustion processes; internal combustion engine study; gas turbine combustion; liquid rocket combustion; energy efficiency in buildings; fundamental experimental diagnostics and investigations; chemical kinetics; geothermal energy; biomass energy; aerosols; propellants and energetics; supersonic and hypersonic propulsion; and others. The department also contains significant expertise in emerging areas such as renewable energy; machine learning based optimization for designing energy systems; computational and experimental methods for designing thin film solar cells; thermo-electric power generation; thermal management for electronics and energy conversion systems; solar-thermal water purification; optical diagnostics and imaging; laser spectroscopy; ultrafast lasers; remote sensing and novel diagnostic applications; catalysis and photocatalysis; carbon dioxide capture and utilization; water treatment and purification; photovoltaics; wind systems; shock waves; plasma engineering; plasma enhanced fuel conversion and combustion; and others.

Research expertise in this area has strong synergy with the Turbomachinery Lab and Energy Systems Lab. In addition, there are significant resources available in individual faculty labs. Research in this area has synergized with classes in renewable and solar energy.

Heat Transfer and Thermodynamics
Heat transfer and thermodynamics related research in a variety of fundamental areas being conducted in the department includes conduction, convection, and radiation; nano-to-macro scale heat transfer; computational methods; and nanometer-scale thermal and mass transport. Specific application areas include gas turbine cooling technology; oil and gas related flow systems and equipment; non-conventional reservoirs and hydraulic fracturing; thermal management for electronics; solar-thermal water purification; nuclear reactors; fluid purification; concentrated solar power; optoelectronics; and MEMS/NEMS design and fabrication. Also, other related multi-disciplinary activities include environmental decontamination and remediation; laser processing; laser-matter interactions; and non-equilibrium phenomena. The related faculty members and affiliated research groups have made significant contributions to areas such as turbine blade film cooling and internal heat transfer enhancements; microfluidics; nanofluidics; and HVAC systems and building thermal management. As Additionally, these faculty have made significant improvements and additions to undergraduate and graduate courses in the heat transfer area.

Materials
Research in materials encompasses a broad range of topics from fundamental material development, such as polymers, ceramics, metals, composites, functional materials, and materials for energy storage. Materials research in the department has direct application to energy, automotive, aerospace, and healthcare systems. Current research activities include design optimization for new materials; scalable nanomanufacturing and nanofabrication; development of multifunctional surfaces for flame retardant, gas barrier, and antimicrobial applications; synthesizing fully organic thermoelectric materials; nanomaterials for energy conversion; functional materials for dental implants; advanced materials for batteries and fuel cells; and processing high temperature and magnetic shape memory alloys.

Fluid Mechanics
The faculty members in the fluid mechanics research area work on general areas of theoretical, experimental, and computational fluid dynamics. Current research activities include fluid dynamics and interfacial phenomena; two-phase flow; viscous incompressible fluids; multi-phase flows; boiling-condensation; phase-change materials; microfluidics and nanofluidics; fluid-structure interactions; spray and liquid atomization; reaction flow systems such as combustion and plasmas; and high-speed aerodynamics. Computational fluid dynamics (CFD) methods and tools are developed for novel applications, as well as commercial and open-source software tools are utilized for complex applied systems related to various industries and commercial applications. Traditional and new experimental tools are developed and implemented for system design, monitoring, and model validation purposes. Specific application areas range from gas-turbine systems, rotating machinery such as pumps and turbines for oil & gas applications, and HVAC systems, to aerosols, biofluids, and cardiovascular flow.

The associated faculty members teach courses ranging from basic undergraduate fluid mechanics and thermo-fluid system design, to graduate-level courses in advanced fluid mechanics, CFD, combustion, gas dynamics, experimental measurements, and optical diagnostics. These faculty members are active in numerous related professional organizations and bring in a vast amount of industrial and research laboratory experience. In addition, they provide service for many industrial, commercial, and government entities.

**Solid Mechanics**
Faculty in the solid mechanics area conduct research in a broad area of theoretical, computational, and experimental mechanics. Research includes the study of mechanics of materials from metals, polymers, granular materials, and composites, to biological materials understanding nonlinear and field coupling phenomena (diffusion-reaction-swelling of gels, electro-magnetic and thermo-mechanical responses of active materials), mechanics of growth and remodeling of biological systems, damage and fracture of materials, mechanics of material processing and manufacturing. The group also conducts research at the forefront of multi-disciplinary areas, such as bone biomechanics, aortic dissection, high velocity impacts, dynamics fractures and high strain rates, soft robotics, genetic architecture of plant biomechanical properties, and materials under extreme environments, and provides leadership through professional service activities, editorial board memberships, etc.

The mechanics group teaches a combination of basic tools of fundamental mechanics subjects, mechanical design processes, problem solving techniques, and the ability to formulate engineering problem so students can apply knowledge of science, mathematics, and computations to carry out engineering tasks and work effectively in multidisciplinary environments.

**Design and CAE**
Design research in the department includes a wide range of activity, including basic technology development research to enable the creation of new goods and services such as haptic surfaces, medical rehabilitation devices, novel bearings, manufacturing devices, rotating systems, and others. Additionally, there is significant research expertise into methods and algorithms for complex system design. Design research areas of expertise include uncertainty quantification; multidisciplinary design optimization; compositional methods for simulation-based design; general bio-inspired design methods; bio-inspired systems design problems focusing on the use of ecological network characteristics and analysis techniques to design resilient and sustainable complex human networks, systems, and systems of systems; computational methods (including optimization, machine learning, and artificial intelligence) for supporting engineering systems design; decision making in systems engineering; functional modeling; innovation in concept synthesis including computational methods; design for disability; technology evolution as applied to product and system design; geometric modeling; human-computer interactions; mixed-initiative interactions for augmenting human expression and creativity in product, industrial and engineering design; computer-aided design; geometry & image processing; visualization techniques for collaborative conceptual design; and others.
Design area research has synergized with the development of specialized classes focusing on bio-inspired design and multidisciplinary design optimization.

**Controls**
Research in fundamental control theories in the department has a number of societal impact foci, including autonomy; manufacturing; rehabilitation robotics; quantum cognition; control and diagnostics of connected and autonomous ground vehicles; routing of unmanned vehicles; decision-making under uncertainty; smart or adaptive structures; real-time shape control of both structures and optical systems; space/time filter design for control of distributed parameter systems; morphing aircraft; multi-rotor drone aircraft control; autonomous vehicles and associated systems; precision mechatronics; network-based control and cyber-physical systems; novel actuators and sensors; real-time control systems design; computational intelligence; robotics and automation; fault diagnosis and identification; human-robot interaction; robots, locomotion, and manipulation; precision engineering-inspired approaches to manufacturing and metrology; modeling and control of roll-to-roll manufacturing systems; control of large-scale nonlinear dynamic systems; collaborative decision making, combinatorial optimization, and vision based control; air traffic control; and others. Researchers in the controls area have synergy with the Star Lab and the Center for Autonomous Vehicles and Sensor Systems (CANVASS).

**Dynamics, Vibrations, and Acoustics**
Departmental research in dynamics, vibrations, and acoustics has a broad range of fundamental and application foci. Applications include microelectromechanical systems (MEMS) and robotics, mechanical systems and design; high precision motion controls; autonomous vehicles; rotordynamics; structural vibration; rotating machinery; active vibration and noise control; real-time shape control of both structures and optical systems; space/time filter design for control of distributed parameter systems; morphing aircraft; multi-rotor drone aircraft control; sensing; and energy harvesting.

### 4.2 RESEARCH CENTERS

**Center for Autonomous Vehicles and Sensor Systems**
Co-director: Dr. Swaminathan Gopalswamy  
Co-director: Dr. Srikanth Saripalli

The mission of the center is to unify research and development of autonomous vehicles and systems to better serve the state and nation. CANVASS is joint venture of the Texas A&M Engineering Experiment Station and the Texas A&M University College of Engineering. CANVASS is a multi-laboratory center with investigators in various departments within the college administered through mechanical engineering. The research interests span autonomous ground vehicles (passenger cars and trucks, commercial trucks and buses, transit vehicles, shuttles, etc.), aerial vehicles (fixed wing vehicles as well as multicopters and other similar vehicles), autonomous vehicles for agriculture as well as associated algorithms and techniques such as Machine Learning, Deep Learning, Artificial Intelligence, Robotics and Human Machine Interaction. CANVASS facilities include 18 wheeler trucks, cars, off-road vehicles, Unmanned Aerial Vehicles and test and evaluation facilities at RELLIS.

Affiliated Faculty: Gopalswamy and Saripalli

**Center of Innovation in Mechanics for Design and Manufacturing (CiMDM)**
Director: Dr. J.N. Reddy  
[https://cimdm.tamu.edu/](https://cimdm.tamu.edu/)

The threefold mission of the Center of Innovation in Mechanics for Design (CiMDM) and Manufacturing is: research; education and training and global collaborations; and industry and governmental lab outreach (provide consultancy and expert technical services to industry and also collaborative in research with government labs).
The center aims to solve the need for mechanics support for early stage design and subsequent manufacturing. This is complementary to the advances in manufacturing techniques, sensor-based manufacturing process prognostics, supply chain innovations, and quality control measures. Developments and advances in mechanics are essential to gaining insight into the physics of these processes.

Affiliated Faculty: Reddy, Srinivasa, Lacy

**Energy Systems Laboratory**  
Director: Dr. David E. Claridge

In 1939, the Texas Engineering Experiment Station (TEES) formed the Engineering Test Laboratory to test and rate fans and blowers in the air moving industry. In 1985 it was moved to the Department of Mechanical Engineering, which upgraded the facility for air conditioning and heat pump research. The name was also changed to the Energy Systems Laboratory (ESL) to reflect the expanded scope. Today, the ESL is an interdisciplinary TEES division with faculty from the departments of mechanical engineering, architecture and construction science. The ESL is responsible for improving building and industrial energy efficiencies, the measurement and reductions from energy efficient projects, and energy codes training and evaluation.

In 1995, the ESL began metering all large buildings, power plants and thermal plants at Texas A&M University. The continuous commissioning of these facilities resulted in over $3.5 million in savings in 2003 and over $30 million since the beginning of the commissioning program. Other benefits include better comfort; improved working environment, and increased productivity. In 2002, with the start of electric utility deregulation in Texas, the ESL worked with its sister universities, which include Kingsville, Corpus Christi, Laredo, Galveston, IBT, Commerce and Tarleton, to secure electrical contracts. The aggregated loads saved $1.5 million for these universities in 2002. The ESL has secured the electrical contracts for these seven universities through 2005.

This Department of Energy funded program conducts audits of small- to medium-sized manufacturing firms using students as well as ESL staff and faculty. To date, over 450 audits have been conducted, and approximately 60 percent of the recommended conservation measurements have been implemented, resulting in tens of millions of dollars of savings to Texas industries. In 2002, the U.S. Department of Energy recognized the Texas A&M IAC with a Center of Excellence Award.

The ESL was selected by the Texas Council for Environmental Quality as the authoritative source to calculate emissions reductions from energy efficiency. The Laboratory will be responsible for evaluating new proposed code changes as well as training designers, architects, home builders and inspectors on the newly adopted energy codes. Also, the Home Ventilating Institute (HVI) named the Energy Systems Laboratory as their certification laboratory for both air and sound testing. The ESL will work with HVI member companies to rate and certify their fans in accordance with national testing standards.

Affiliated Faculty: Claridge, Pate, Rasmussen

**Turbomachinery Laboratory**  
Director: Dr. Eric Petersen  
[https://turbolab.tamu.edu/](https://turbolab.tamu.edu/)

The Turbomachinery Laboratory, a center of the Texas A&M Engineering Experiment Station (TEES) and a member of the Texas A&M University System, proudly continues Texas A&M’s land-grant charter and tradition of identifying research areas critical to the state’s economic development, leadership, and quality of life. The Turbomachinery Laboratory conducts basic and applied research into important problems of fundamental interest to all aspects of turbomachinery, propulsion, and energy production. Their research has applications ranging...
from power generation and oil&gas distribution to jet engines and rocket propellants. The research program at the Turbomachinery Laboratory is conducted by faculty, students, and staff at Texas A&M. Current specialties include rotordynamics, turbine blade heat transfer, combustion, advanced optical diagnostics, design optimization, bearings, aerothermodynamics, mechanical seals, CFD, engine reliability, machine learning, and advanced fuels and energetics. They draw on the world-renowned research expertise of Texas A&M’s College of Engineering and the Texas Engineering Experiment Station.

The Turbo Lab sponsors two large industrial symposia to provide continuing education opportunities to users of industrial turbomachinery, and to generate profits to foster and support graduate and undergraduate education in turbomachinery. It also provides an opportunity for collaborative research among faculty members throughout the college in the area of turbomachinery.

In sum, the Turbomachinery Laboratory makes a vital impact on turbomachinery and related industries through three pathways:

1. **Research:** Turbo Lab faculty and students team up with industry partners to conduct research into important problems of reliability and performance of turbomachinery through the Turbomachinery Research Consortium (TRC). The TRC is a unique organization of major turbomachinery developers and users who have joined with the Turbo Lab to find answers to important questions through cutting-edge research. More than 35 industrial firms provide an annual membership fee of $25,000 to support a broad range of member-selected research projects. TRC members have access to XLTRC2, a suite of high-speed, experimentally verified and user-friendly codes for executing a complete lateral and torsional rotordynamic analysis of rotating machinery, including pumps, compressors and turbines. XLTRC2 is bundled with 25 or more examples of rotordynamic analysis, including rotors for compressors, pumps and gas turbines. Each model features distinctive bearing/seal support conditions and displays unique characteristics of rotordynamic behavior. In addition to XLTRC2 software, TRC members now have access to XL_Thrustbearing®, a fast and accurate computational design tool for tilting pad thrust bearings. XL_ThrustBearing® facilitates rapid modeling of thrust bearings over a wide range of operating conditions, including surface speed, load and fluid types. In addition to funding from the TRC, the Turbo Lab receives funding from grants and contracts from government agencies, the State of Texas and private companies. Funds provide continuing support for graduate research and education related to performance, rotordynamics, acoustics, seals, tribology, couplings, computational and experimental fluid dynamics, heat transfer, torsional vibrations, materials and finite element analysis.

Turbo Lab faculty, staff and students conduct cutting-edge research for industry and government entities in a state-of-the-art facility located on George Bush Drive in College Station, Texas, adjacent to the university’s main campus. The 37,000 square foot high-bay facility is equipped with 12 top-of-the-line vibration damped test cells and a variety of compressors that provide air for test rigs with capacities ranging from 4000 standard cubic feet per minute (scfm) at 120 pounds per square inch gauge (psig) to 1350 scfm at 300 psig. An adjacent reciprocating compressor rig features connections for high-pressure air.

In addition to TRC research, the Lab conducts industry and government-sponsored projects.

2. **Education:** The Turbo Lab produces engineers ready to work by offering undergraduate and graduate engineering education through Texas A&M’s J. Mike Walker ’66 Department of Mechanical Engineering. The Turbomachinery Research Consortium blends the Turbo Lab’s impact areas of education and research by teaming graduate students with industry to find solutions to real-world problems. Turbo Lab students are highly sought after for industry positions upon graduation.
3. **Workforce development (symposia and short courses):** The Turbo Lab impacts the turbomachinery industry by providing a platform for the continuous exchange of ideas among working professionals. These platforms include the annual [Turbomachinery & Pump Symposia (TPS)](https://www.tpssociety.org/) in Houston, the biennial [Asia Turbomachinery & Pump Symposium (ATPS)](https://www.atpsociety.org/) in Southeast Asia, and various extended short courses held throughout the year.

Affiliated Faculty: Petersen, Allaire, Delgado, Han, Kulatilaka, Mathieu, Palazzolo, San Andres, Wright,

**INVENT Lab**
Director: Dr. Cynthia Hipwell
[https://www.theinventlab.com/](https://www.theinventlab.com/)

The mission of the INVENT Lab is to help researchers and companies get technology developed and to market faster through development and application of innovation accelerating tools and new technology feasibility demonstration. The INVENT lab has technical focus on haptics, tribology of robots, mems/nems characterization, and nanophotonics

Affiliated Faculty: Hipwell, Lan, Seets

**Starlab Facility**
Director: Dr. James Hubbard Jr.
[https://starlab.engr.tamu.edu/](https://starlab.engr.tamu.edu/)

The 2,000-acre RELLIS campus promotes advanced research and technology development and education. Through the RELLIS Starlab Facility, academic, government and industry partners, along with Texas A&M students, faculty and staff, collaborate to find innovative solutions to pressing engineering and technology challenges that affect the community, the state of Texas, the nation and ultimately, the world.

Affiliated Faculty: Hubbard, Saripalli, Balas, Walsh

**RELLIS Campus Facility**
[https://rellis.tamus.edu/](https://rellis.tamus.edu/)

An additional research facility is located on RELLIS Campus, which is the newest facility to foster advanced research, technology development, testing and evaluation, higher education, and hands-on career training. The campus is a research home to several university and system related ventures, including Texas A&M Engineering Training Service (TEEX), the Texas A&M Engineering Research Station (TEES), and the Texas A&M Transportation Institute. The RELLIS Campus is built on 2,000-acre land, which has a cluster of seven new buildings and test beds to encourage the private sector to develop research facilities adjacent to the Texas A&M System’s site. Current research focus includes robotics, driverless and connected vehicles, advanced manufacturing, large-scale testing, as well as smart power grids and water systems.
5. ASSESSMENT OF THE GRADUATE PROGRAM

In this chapter, the committee provides an overall assessment of the J. Mike Walker ’66 Department of Mechanical Engineering’s graduate program. The state and role of the department in the university mission is presented first, followed by brief comparisons with peer institution and other departments within the college of engineering. Finally, an analysis of the graduate program’s strengths, weaknesses, opportunities, and threats is discussed.

5.1 STATE OF THE DEPARTMENT AND ROLE IN THE UNIVERSITY MISSION

Vice Chancellor and Dean of Engineering M. Katherine Banks’ announcement of the 25x25 plan (where the college of engineering will grow to 25,000 students by the year 2025) provides an unparalleled opportunity to grow. The initiative impacts both undergraduate and graduate programs. The largest path of graduate growth for this program is through distance learning master’s programs and increasing the number of M.Eng students. The department currently has 61.43 FTE T/TT faculty, 18 APT faculty, and 16 faculty with courtesy appointments, and total graduate students of 498. With 398 graduate students working on research, we have approximately 6.5 research students per T/TT faculty.

The College of Engineering, Texas A&M Engineering Experiments Station (TEES) focus areas are energy (nuclear, oil and gas), healthcare, cybersecurity and informatics, manufacturing, hypersonic, autonomy and sensors materials, smart grids, and infrastructures. Our department’s thrust areas are well aligned within the TEES strategic areas, in which our faculty contribute strongly in the energy, advanced manufacturing, autonomous vehicles, materials, and biomechanics and healthcare researches.

5.2 PEER GROUP ASSESSMENT

This section briefly presents assessments of the mechanical engineering department in terms of scholarly activities and research expenditures as compared to peer institutions. Figure 24 shows an overview of the department ranking over the past six years based on the graduate rankings from *U.S. News and World Report*. The graduate program has remained strong in the top 10 among public institutions.

The following top ranked (as per graduate schools, USNWR) public institutions are considered peer schools. They are listed in descending ranking:

University of California Berkeley (UC Berkeley), Georgia Institute of Technology (Georgia Tech), University of Michigan (Michigan), University of Illinois at Urbana Champaign (Illinois), Purdue University (Purdue), University of Texas Austin (UT Austin), The Pennsylvania State University (Penn State), University of California Los Angeles (UCLA), University of California San Diego (UCSD), University of Wisconsin Madison (UW Madison), and Virginia Polytechnic Institute and State University (Virginia Tech).

Table 17 shows the USNWR rankings as well as the Shanghai Ranking for Texas A&M and our peers. The annual USNWR rankings for departments are purely based on peer assessment, while the Shanghai ranking is based on publications, citations, international collaborators, publications in top journals, and awards (details for the rubric is provided at [http://www.shanghairanking.com](http://www.shanghairanking.com)). Based on strict numbers, Texas A&M fares very well in the Shanghai ranking as well.
Table 17. USNWR and Shanghai rankings of the mechanical engineering departments at Texas A&M and peer institutions.

<table>
<thead>
<tr>
<th>Institution</th>
<th>USNWR Ranking (Public)</th>
<th>Shanghai Ranking (2018)</th>
</tr>
</thead>
<tbody>
<tr>
<td>UCSD</td>
<td>10</td>
<td>4</td>
</tr>
<tr>
<td>Texas A&amp;M</td>
<td>9</td>
<td>7</td>
</tr>
<tr>
<td>Michigan</td>
<td>3</td>
<td>11</td>
</tr>
<tr>
<td>UC Berkeley</td>
<td>1</td>
<td>17</td>
</tr>
<tr>
<td>Illinois</td>
<td>4</td>
<td>18</td>
</tr>
<tr>
<td>UT Austin</td>
<td>6</td>
<td>21</td>
</tr>
<tr>
<td>Georgia Tech</td>
<td>2</td>
<td>22</td>
</tr>
<tr>
<td>Purdue</td>
<td>5</td>
<td>26</td>
</tr>
<tr>
<td>Penn State</td>
<td>7</td>
<td>51-75</td>
</tr>
<tr>
<td>Virginia Tech</td>
<td>12</td>
<td>51-75</td>
</tr>
<tr>
<td>UCLA</td>
<td>8</td>
<td>101-150</td>
</tr>
<tr>
<td>Wisconsin</td>
<td>11</td>
<td>101-150</td>
</tr>
</tbody>
</table>

The figures below show data obtained from ASEE, 2018 (http://profiles.asee.org/), and compare mechanical engineering at Texas A&M with its peer group. Figure 25 shows the number of faculty by rank at Texas A&M and its peer mechanical engineering departments. It includes tenure track faculty (full, associate, and assistant professors), as well as full-time employment academic professional track faculty (FTE APT). Texas A&M has the second largest number of faculty, including APT. The department is planning the continued growth of tenure track faculty, which typically lags student growth. Schools are arranged by USNWR ranking.
Figure 25. Number of faculty by rank at Texas A&M and peer mechanical engineering departments

Figure 26 shows the total graduate student enrollment from 2018, including Ph.D. and master’s (M.S. and M.Eng.) at Texas A&M and its peer mechanical engineering departments. Overall, Purdue has the largest number of graduate students, as well as the largest number of Ph.D. students. As the department increases the number of tenure track faculty (T/TT, or TTF), the number of Ph.D. students is also expected to grow.
Figures 27 and 28 show the ratio of the total number of graduate students and total number of Ph.D. students per TTF, respectively. Purdue leads the way with 10.4 graduate students and 6.4 Ph.D. students per TTF. Note that the Ph.D. student ratio is a more representative number since master’s students include M.Eng. students that typically do not conduct funded research.
Figure 27. Number of total graduate students per tenure track faculty (TTF) at Texas A&M and peer mechanical engineering departments

Figure 28. Number of Ph.D. students per tenure track faculty (TTF) at Texas A&M and peer mechanical engineering departments
Figure 29, shows the external research expenditures (ERE) in millions, including the federal ERE, as is self-reported by the institutions to ASEE. Traditionally, the department’s federal funding was significantly lower than its peers, which was compensated by industry, foreign (e.g., Qatar Foundation), and state funding. Since 2013, significant efforts have been made to recruit faculty in research areas that are competitive for federal funding. With recent mid-career and senior faculty hires active in advanced manufacturing, hypersonics, extreme materials, energy, and bio/health areas, federal funding is expected to increase significantly in the next few years. This trend has already begun.

![External Research Funding](image)

**Figure 29.** External research funding of Texas A&M and peer mechanical engineering departments from ASEE

In addition to ASEE self-reported data, Academic Analytics (https://portal2.academicanalytics.com/Account/Login?ReturnUrl=%2F) provides data used by many institutions. In this database, all data are mined by the company, and only includes federal grants when determining funding. In some cases, the data excludes awards and certain journals. Since the majority of external funding in mechanical engineering at Texas A&M is not federal funding, the department, therefore, does not expect to fare as well. The standard weighting factors used for the below data are: articles 30%, awards 10%, books 0%, citations 30%, conference proceedings 11%, and grants 30%. This weighting scheme is used to calculate the Scholarly Research Index (SRI) for each department. For mechanical engineering, 188 institutions, 191 departments, and 4,911 faculty are included. The productivity radar for mechanical engineering at Texas A&M is shown in Figure 30. In most categories the department fairs very well and is placed over the 75th percentile. Exceptions, as expected, are in federal grants, especially in dollars per federal grant. The number of citations per publication is below the 50th percentile, indicating very productive faculty with many recent publications, but a low number of citations.
Texas A&M Mechanical Engineering scholarly research index is 0.2, which is on the low side, compared to our peer institutions, as shown in Figure 31. While the department is quite strong in a number of publications, its weakness is in the lower number for federal grants.
5.3 STRENGTHS, WEAKNESSES, OPPORTUNITIES, AND THREATS (SWOT)

The strengths of the department are related to its reputation, faculty teaching and research, educational programs, size and quality of the graduate students, and administrative system and staff. The department’s graduate program continues to be in the top ten among public institutions, and is highly regarded for its undergraduate and graduate programs. As one of the largest programs in the U.S., graduate students from the department are highly sought after in the diverse workforce from industry, research labs, and academia, nationwide and beyond. The graduate programs and its faculty are also well recognized internationally, as reflected by high numbers of international student applications every year and numerous national and international faculty collaborations. This reputation is strengthened by the successes of its former students and resources they provided, such as donations, engagements, and program support. The department endowment has grown substantially since 2012, from $21.7M to $71.6M, with an additional $13.5M in planned giving, as shown in Figure 32. The endowment proceeds are about $2.9M, with $1.03M going to named faculty appointments, $0.8M to undergraduate scholarships, $0.37M to graduate student fellowships, and $0.67M in unrestricted funds.
The department offers both basic core courses, which prepare its students fundamental knowledge within the traditional mechanical engineering field, and elective courses, which introduce them to emerging technology and research topics. Faculty are actively involved in diverse research areas and cutting-edge research, and have been financially supported by industry, state, and federal grants. Through substantial investments from the Chancellor’s Research Initiative and Governor’s University Research Initiative, the department has recruited National Academy of Engineering members and invested in the areas of autonomous vehicles and innovation technology. Additionally, the department has strong, well organized, and experienced graduate advising office staff.

The weaknesses of the graduate program are associated with lack of significant faculty collaborative research work, faculty workload in non-mission activities, and type and size of funding. As a highly ranked university, the department has not led large federal research initiatives, such as NSF Engineering Research Center (ERC), Department of Defense Multidisciplinary University Research Initiative (MURI), etc. Compared to the identified group of peer institutions, mechanical engineering at Texas A&M is also behind in the amount of federal funding. This could be attributed to poor collaborations among faculty; the type of research faculty conduct, which is more appealing to industry; and increasing class size due to growth in student populations. Another contributing factor may be linked to the lack of seed funding for new research initiatives, which has recently been addressed.

The number of domestic graduate students in the department is below the target of 40%, and the department is perceived as less competitive in terms of recruiting domestic students. One of the reasons for the low number of domestic students could be related to matching student and faculty research interests. Another reason could be due to the inability to offer long-term graduate research assistantships (GRA) to incoming graduate students. These issues have are being addressed using the Graduate Program Fee ($1M), in addition to investments from the endowment.

The opportunities in the department are multifold. With growing interests in research and technology in the areas of manufacturing, autonomy, robotics, healthcare, hypersonic vehicles, and energy sectors, the mechanical
engineering department will play a key role in these fields. Numerous faculty have expertise to contribute in the above fields. It is necessary to identify the specific research activities where faculty can be leaders. Recent initiatives in internal seed funding from the university and department, e.g., X grant, T3, Innovative X, MEEN seed grant, will give opportunities for mechanical engineering faculty to initiate collaborations across departments and colleges in order to lay a foundation for larger collaborative research centers. The development of the RELLIS campus provides the department access to numerous facilities to conduct research in the above mentioned areas.

The J. Mike Walker ‘66 endowment will help the department with long-term GRA support for recruiting highly talented graduate students and domestic students, and seed funding for faculty collaborations. The GTF program and increase in numbers of APT faculty will help with teaching large undergraduate courses, which can allow research active faculty to be more focused on advancing the department research. At the same time the GTF program provides graduate students with teaching experience to be competitive in obtaining faculty positions.

The threats in the department are related to recent competition with other departments within the college and peer institutions. Many schools and departments in the nation are growing in size of their students and faculty, which is not accompanied by significant growth in federal funding. This can create competition for securing federal funding.

By focusing too much on ranking and its criteria, which emphasize on research activities, can limit faculty time and effort in teaching and educating students. Students can benefit tremendously by learning from highly experienced and well accomplished faculty.

6. THE FUTURE OF THE DEPARTMENT

By Andreas A. Polycarpou, Department Head, James J. Cain ’51 Chair Professor & Meinhard J. Kotzebue Professor

I moved to Texas A&M to lead the department on December 1, 2012. Previously I was the associate department head for the undergraduate program and the Wilkins Professor at the Department of Mechanical Science and Engineering at the University of Illinois at Urbana-Champaign. The J. Mike Walker ‘66 Department of Mechanical Engineering at Texas A&M enjoys a strong local, national, and international reputation as a premier undergraduate and graduate research institution, with the main campus in College Station, Texas and a satellite campus in Doha, Qatar. The department has advanced its reputation with a strong, competitive graduate program, in addition to its superb undergraduate program. Furthermore, the department, in collaboration with the College of Engineering and the Texas Engineering Experiment Station (TEES), continues to strengthen its position as a major center of excellence where superb scientific research is conducted and technological advances and breakthroughs are realized.

Historically, much of the fine reputation of the department is founded on its undergraduate program. It is recognized for its solid background in mechanical engineering fundamentals, and for having instilled a strong work ethic and can-do attitude among its graduates. The abiding appreciation of former students from the mechanical engineering bachelor’s program fuels much of the generous support the department receives, with an existing realized endowment of over $85.1M. Maintaining a continually updated, strong undergraduate mechanical engineering program will be a major factor in the future of the department, to be able to better serve today’s students. Vice Chancellor and Dean of Engineering M. Katherine Banks’ 25x25 plan, an initiative to increase enrollment in the College of Engineering to 25,000 students by the year 2025, provides an unparalleled advancement opportunity. Such a growth will be thoughtfully targeted and planned at all levels: onsite undergraduates, master’s and Ph.D. students, and distance learning M.Eng. students. This expansion will position the department at the forefront of undergraduate and graduate education and research, achieving preeminence.
The faculty are firmly committed to strengthening the mechanical engineering graduate program and the goal is to continue to move up in the rankings.

The department’s doctoral program, with over 250 enrolled doctoral students, is critical to our mission because it produces the most highly trained mechanical engineers for placement as professors and researchers at competitive universities; in industries in Texas, the nation, and internationally; and as researchers in national laboratories. The department will continue to enhance the offering of graduate courses at the cutting edge of technology, as evidenced by the number of special topics courses it offers. This will ensure the doctoral graduates produced by this program are prepared to make significant contributions in emerging technologies, such as alternative forms of energy production, storage and distribution, and interdisciplinary large scale societal problems, as they relate to human health and the environment.

In the years ahead, there will be a greater emphasis on the department’s Ph.D. program. Currently the Ph.D. student to tenured track/tenured faculty ratio is 4.27:1, and many of our Ph.D. students are fully funded. The goal is to first ensure that all full-time Ph.D. students in mechanical engineering are fully funded and then work to increase the student-to faculty ratio to approximately five Ph.D. students per T/TT faculty. Also, the department is currently administering approximately $370,000 in graduate fellowships that come from endowments and gifts. The goal is to increase the endowment/gifts for graduate fellowships by a factor of 3 during the next decade. In addition to the strong and healthy Ph.D. program, the department also has a large Master of Science program with nearly 150 students that are an integral part of the research enterprise of the department. These students are supported primarily by competitive research grants, as well as major research centers, such as the Turbomachinery Laboratory, the Energy Systems Laboratory, and Autonomous Vehicle Center.

The current number of tenure-track and tenured faculty is 61.43, supplemented by 18 academic professional track faculty. The department is currently recruiting seven tenured track/tenured faculty with the prospect of further growth in the very near future. These factors point to a very favorable climate for the further development of the department and especially for the strengthening of its doctoral program to achieve preeminence.
APPENDIX A. FACULTY BIOSKETCHES

Name: Douglas Allaire  Academic Rank and Title: Assistant Professor

Degrees: Ph.D., Aerospace Engineering Massachusetts Institute of Technology, 2009
M.S., Aerospace Engineering Massachusetts Institute of Technology, 2006
B.S., Aerospace Engineering Massachusetts Institute of Technology, 2004

Years of Service on Texas A&M Faculty: 6
Assistant Professor (01/2014-present)

Other Related Experience:
- Lecturer, MIT, Cambridge, MA (2012)
- Postdoctoral Associate, MIT, Cambridge, MA (2009 – 2011)

State(s) in which registered: N/A

Undergraduate and Graduate Courses Taught:
- MEEN 357 Engineering Analysis for Mechanical Engineers
- MEEN 401 Introduction to Mechanical Engineering Design
- MEEN 602 Modeling and Analysis of Mechanical Systems
- MEEN 683 Multidisciplinary System Analysis and Design Optimization

Recent Graduate Student Advising:
Ph.D. Students Advised
- Danial Khatamsaz (Spring 2019 – Present), Jaylen James (Spring 2018 – Present), Samuel Friedman (Fall 2015 – Present), Benson Isaac (Fall 2014 – Present), S. Fatemeh Ghoreishi (Summer 2016 – May 2019), Brian Burrows (Spring 2015 – May 2019)

M.S. Students Advised
- Lalith Peddyreddygari (Spring 2019 – Present), Arjun Singh (Spring 2019 – Present), Meet Sanghvi, (Spring 2018 – Present), Samuel Friedman (Fall 2015 – Spring 2019), R. Cory Allen (Fall 2017 – Spring 2018), W. Dillon Thomison (Fall 2015 – Spring 2017), Warren Rooney (Fall 2015 – Fall 2016), Kaiyu Li (Fall 2014 – Fall 2016), S. Fatemeh Ghoreishi (Fall 2014 – Summer 2016)

Five Recent Publications:

Scientific and Professional Society Memberships/Offices:
- American Institute of Aeronautics and Astronautics (AIAA), Senior Member
- American Society of Mechanical Engineers (ASME), Member
- Society for Industrial and Applied Mathematics (SIAM), Member
- SIAM Activity Group on Uncertainty Quantification, Member
- SIAM Activity Group on Computational Science and Engineering, Member

Recent Honors and Awards:
- ASME CIE Young Engineer Award, 2018
- ASME DAC Best Paper Award, 2018
- Dean of Engineering Excellence Award, 2017
- James J. Cain Graduate Teaching Award, 2017

Other Recent Professional Activities:
- Consulting: N/A
- Patents: N/A
- Service: N/A

Professional Development: N/A

Percentage of time committed to the program: 100
Name: Jorge Alvarado  
Academic Rank and Title: Professor

Degrees:  
Ph.D., Mechanical Engineering, University of Illinois at Urbana-Champaign, 2004  
M.S., Mechanical Engineering, University of Illinois at Urbana-Champaign, 2000  
B.S., Mechanical Engineering, University of Puerto Rico at Mayaguez, 1991

Years of Service on Texas A&M Faculty: 15  
Professor, Department of Engineering Technology and Industrial Distribution, Texas A&M (2016-present)  
Associate Professor, Department of Engineering Technology and Industrial Distribution, Texas A&M (2010-2016)  
Assistant Professor, Department of Engineering Technology and Industrial Distribution, Texas A&M (2004-2010)

Other Related Experience:  
Research Assistant, U.S. Army Corps of Engineers, Construction Engineering Research Lab (CERL) and University of Illinois at Urbana-Champaign, 2000-2004

State(s) in which registered:  
Professional Engineering License in Mechanical Engineering, Puerto Rico (USA), Lic. No. 12193

Undergraduate and Graduate Courses Taught:  
MMET 303 Fluid Mechanics and Fluid Power  
MMET 370 Thermodynamics  
MMET 641 Data Analysis, Simulation & Experimental Methods for Industry  
ITDE 685 Independent Study/Directed Studies

Recent Graduate Student Advising:  
Ph.D. Students Advised:  
Yi Wang, Jayaveera Muthusamy, Jeongmoon Park, Omid Saber, Taolue Zhang, Chun-Wei Yao, Qibo Li, Minsuk Kong  
M.S. Students Advised:  
Sarojeet Deb, Syed Mohammad Haq, Jose Mejia, Hao-En Lee, Junfeng Men, Ge Yi Fan

Five Recent Publications

**Scientific and Professional Society Memberships/Offices:**
- Engineering Honor Society Tau Beta Pi
- Honor Society Phi Kappa Phi
- American Society of Mechanical Engineers
- American Society of Engineering Education
- American Society of Heating, Refrigerating and Air-Conditioning Engineers (ASHRAE)
- American Physical Society (APS)
- American Society of Thermal and Fluids Engineers (ASTFE)
- Society of Hispanic Professional Engineers (SHPE)
- Reviewer for Journal of Thermal Analysis and Calorimetry
- Reviewer for Journal Energy
- Reviewer for Journal of Energy and Buildings
- Reviewer for International Journal of Heat and Mass Transfer
- Reviewer for Journal Thermochimica Acta
- Reviewer for Journal of Heat Transfer
- Reviewer for Nanoscale Research Letters
- Reviewer for Journal of Thermophysics and Heat Transfer
- Reviewer for Chemical Engineering Journal
- Reviewer for Nature Communications

**Recent Honors and Awards:**
- Distinguished Achievement Award for Teaching, Research and Service by the Department of Engineering Technology and Industrial Distribution 2017
- Charlotte and Walter Buchanan Faculty Fellow in Engineering Technology and Industrial Distribution 2014-2015
- Association of Former Students (AFS) College Level Distinguished Achievement Award 2009-2010
- TEES Select Young Faculty Award 2008-2009
- Chevron Faculty Fellow Award 2007-2008
- Distinguished Achievement Award for Research by the Department of Engineering Technology and Industrial Distribution 2012
- Distinguished Achievement Award for Teaching, Research and Service by the Department of Engineering Technology and Industrial Distribution 2008

**Other Recent Professional Activities:**
**Patents:**

**Service:**
- Faculty Senate (Senator: 2010-2013, 2017-2020)
- Member of the Academic Affairs and Research Committees of the Faculty Senate
- Member of Executive Committee of Faculty Senate (2012-2013, 2018-2019)
- Council of Principal Investigators (CPI), 2014-2016, 2017-2020
Member of Executive Committee of CPI (2014-2015)
Faculty affiliate of TAMU Energy Institute (EI)
Faculty affiliate of TEES Gas & Fuels Research Center (GFRC)
Chair of College-level Ad Hoc Committee on Joint Appointments
ETID Representative at CETPAC (College-level Promotion and Tenure committee)
College representative on the University Grievance Committee
ETID Representative in College-Level Diversity Committee

**Professional Development:**
Participates in the College of Engineers and Surveyors of Puerto Rico (CIAPR) continuing education program for professional engineers.

**Percentage of time committed to the program:** Courtesy appointment
Name: Ahmad Amiri  
Academic Rank and Title: Visiting Assistant Professor

Degrees:  
Ph.D., Mechanical Engineering University of Malaya, 2017  
M.S., Chemical Engineering Ferdowsi University of Mashhad, 2011  
B.S., Chemical Engineering, Azad University, 2009

Years of Service on Texas A&M Faculty: 2  
Visiting Assistant Professor (01/2018-Present)

Other Related Experience:  
Co-Founder, Carbon Gates Technologies LLC (Startup), Cypress, Texas, USA (2019)  
Postdoctoral Fellow, Aerospace Engineering, Texas A&M University (2018)  
Research Assistant, University of Malaya (2014-2017)  
Lab Demonstrator, University of Malaya (2014-2015)  
Water Quality Engineer, Fars Petro-chemical industry (2012-2013)  
Lecturer, Azad University (2011-2013)

State(s) in which registered: N/A

Undergraduate and Graduate Courses Taught:  
MEEN 421 Thermal-Fluids Analysis Design  
MEEN 475 Materials in Design  
MEEN 344 Fluid Mechanics  
MEEN 458 Process & Characterization Polymer

Recent Graduate Student Advising: N/A

Five Recent Publications:  

Scientific and Professional Society Memberships/Offices:  
Affiliated with Texas A&M Energy Institute

Recent Honors and Awards:  
Bright Spark award, University of Malaya, 2014-2017  
Outstanding Student Thesis Award, Sharif University of Technology, 2012  
Top Researcher, Chemical Engineering Department, Ferdowsi University of Mashhad, 2011  
Most Cited Papers Award, Applied Thermal Engineering, 2014
Other Recent Professional Activities:

Consulting: N/A

Patents:
Ahmad Amiri, Mohammad Naraghi, Production of Graphene Nanoparticles and single layer graphene from graphite and expanded graphite via milling, Texas A&M University, US Patent (Pending).
Ahmad Amiri, Morteza Maghrebi, Majid Baniadam, Colloidal suspensions including functionalized carbon nanotubes with amines, September 13, 2014, IR-Patent No. 83802

Service:
Active Reviewer for:

Professional Development: N/A

Percentage of time committed to the program: 100
Name: N.K. Anand    Academic Rank and Title: Professor, Executive Associate Dean

Degrees:     Ph.D. Mechanical Engineering, Purdue University 1983
            M.S. Mechanical Engineering, Kansas State University 1979
            B.E. Mechanical Engineering, Bangalore University, India 1978

Years of Service on Texas A&M Faculty: 34
    Executive Associate Dean (2010-Present)
    Associate Director for TAMU Engineering Experiment Station (2008-present)
    Regents Professor (2014-present)
    James and Ada Forsyth Professor (2007-present)
    Professor (1996-present)
    Acting Vice Chancellor and Interim Dean, College of Engineering 2011-2012)
    Acting Director for TAMU Engineering Experiment Station (2011-2012)
    Interim Executive Associate Dean, College of Engineering (2009-2010)
    Associate Dean for Research, College of Engineering (2008-2010)
    Interim Associate Director for TAMU Engineering Experiment Station (2008)
    Associate Dean for Graduate Programs, College of Engineering (2007-2008)
    Assistant Dean for Graduate Programs, College of Engineering (2004-2007)
    Interim Head, Department of Chemical Engineering (2006-2007)
    Associate Head, Department of Mechanical Engineering (2003-2006)
    Graduate Program Director, Department of Mechanical Engineering (1998-2004)
    Associate Professor, Department of Mechanical Engineering (1991-1996)
    Assistant Professor, Department of Mechanical Engineering (1985-1991)

Other Related Experience:
    Senior Systems Engineer, The Singer Link Division, (1985)
    Systems Engineer III The Singer Link Division, (1983-1985)

State(s) in which registered:
    Registered in the State of Texas, 1989

Undergraduate and Graduate Courses Taught:

Recent Graduate Student Advising:
    Ph.D. Students Advised:
    Han Li, 2018, Park, Jae Hyung, 2016, B.H. Choi, Robert Muyshondt, and Daniel Orea

Five Recent Publications:

**Scientific and Professional Society Memberships/Offices:**

**Recent Honors and Awards:**
- The Association of Former Students Texas A&M University, University Level Faculty Distinguished Achievement Award for Administration, 2018
- Regents Professor, Texas A&M University System, 2014
- Inducted to Kansas State University Engineering Hall of Fame, Manhattan, Kansas, 2011

**Other Recent Professional Activities:**

**Consulting:**
- Texas Utilities, Comanche Peak Steam Electric Station, Texas
- Real Time Simulation of Pressurized Water Reactors
- HTRI, College Station, Texas
- Numerical Modeling of Heat Transfer and Fluid Flow through Plate Heat Exchanger Passages
- Pella, Pella, Iowa
- Pultrusion of Polymers
- Qatar University, Doha, Qatar
- Member, Advisory Committee, Department of Mechanical Engineering
- Louisiana State University, Baton Rouge, Louisiana
- Member, Program Review Panel, Department of Mechanical Engineering

**Patents:** N/A

**Service:**
- Co-Editor - *Journal of Energy, Heat and Mass Transfer* (10/00-present)
- Member, U.S. Delegation, U.S./Japan Seminar: *Thermal Engineering for Global
- Chair, ASME K-20 Committee on Computational Heat Transfer (2009-2012)
- Vice Chair, ASME Committee on Engineering accreditation (2018-2020)
- ABET Program Evaluator – Mechanical Engineering (2004 -)
- ABET EAC Commissioner – (2018 -)

**Professional Development:** N/A

**Percentage of time committed to the program:** 15
Name: Dion Antao  
**Academic Rank and Title:** Assistant Professor

**Degrees:**
- Ph.D., Mechanical Engineering, Drexel University, 2013
- M.S., Mechanical Engineering, Drexel University, 2009

**Years of Service on Texas A&M Faculty:** 2  
Assistant Professor (2017-Present)

**Other Related Experience:**
- Research Scientist, Massachusetts Institute of Technology, 2016-2017  
- Postdoctoral Research Associate, Massachusetts Institute of Technology, 2013-2016

**State(s) in which registered:** N/A

**Undergraduate and Graduate Courses Taught:**
- MEEN 615 Advanced Engineering Thermodynamics  
- MEEN 344 Fluid Mechanics  
- MEEN 315 Principles of Thermodynamics  
- MEEN 315H Principles of Thermodynamics (Honors)

**Recent Graduate Student Advising:**
- Ruisong Wang, Ph.D., 2017-Present  
- Karan Jakhar, Ph.D., 2018-Present  
- Sanat Kumar, M.S., 2019-Present

**Five Recent Publications:**

**Scientific and Professional Society Memberships/Offices:**
- Member of the American Chemical Society (ACS)  
- Member of the American Physical Society (APS)  
- Member of the American Society of Mechanical Engineers (ASME)  
- Member of the American Society of Thermal and Fluids Engineers (ASTFE)

**Recent Honors and Awards:**
- Engineering Genesis Award, Texas A&M Engineering Experiment Station, 2019  
- Gordon Research Conference Travel Fellowship, 2015 and 2008  
- APS “Opportunities in Energy” Workshop Travel Fellowship, APS, 2013
Engineering Design Education Fellowship, Drexel University, 2012
George Hill, Jr. Endowed Fellowship, Drexel University, 2012
Best Student Paper and Presentation, ASME Noise Control and Acoustics Division, 2011
Best Poster (Computational category- Research Day), Drexel University, 2010
College of Engineering Dean’s Fellowship, Drexel University, 2009 and 2007

**Other Recent Professional Activities:**

**Consulting:** N/A

**Patents:** N/A

**Service:**

**Professional Development:** N/A

**Percentage of time committed to the program:** 100
Name: Raymundo Arroyave  
Academic Rank and Title: Professor

Degrees:  
Ph.D. Materials Science; Massachusetts Institute of Technology  
M.S. Materials Science and Engineering; Massachusetts Institute of Technology; B.S. Mechanical and Electrical Engineering; Instituto Tecnológico y de Estudios Superiores de Monterrey

Years of Service on Texas A&M Faculty: 13  
Presidential Impact Fellow, Professor, MSEN, Texas A&M (2006-present)

Other Related Experience:

State(s) in which registered:

Undergraduate and Graduate Courses Taught:  
MEEN 222 Introduction to Materials Science and Engineering  
MEEN 357 Numerical Analysis for Mechanical Engineers  
MEEN 404 Engineering Laboratory (Design of Experiments  
MSEN 601 Fundamentals of Materials Science and Engineering  
MSEN 640 Thermodynamics in Materials Science  
MSEN 620 Kinetics of Materials  
MSEN 655 Materials Design Studio

Recent Graduate Student Advising:  
Anjana Talapatra, Daniel Sauceda, Kubra Karayagiz, Luke Johnson, Nayan Chaudhary, Pejman Honarmandi, Ruben Villareal, Sean Gibbons, Thien Duong, Vahid Attari, Woongrak Son

Five Recent Publications

Scientific and Professional Society Memberships/Offices:  
(2017-2020) Member, Board of Directors, The Minerals, Metals and Materials Society (TMS)  
(2019-2020) Member, Executive Committee, TMS  
(2017-2020) Chair, Functional Materials Division (TMS)  
(2017-2020) Chair, Alloy Phase Diagram Committee, ASM International
Recent Honors and Awards:

2019  Chancellor EDGES Fellow, Texas A&M University
2019  Brimacombe Medal, TMS
2018  Institute for Engineering Education and Innovation (IEEI) Fellow, College of Engineering, Texas A&M University
2018  William O. and Montine P. Head Faculty Fellow, College of Engineering, Texas A&M University
2017  Presidential Impact Fellow, Texas A&M University

Other Recent Professional Activities:

Consulting:
Expert Witness, Intellectual Property

Patents: N/A

Service:
Department: Chair, Curriculum Committee
College: College of Engineering Tenure and Promotion Committee
University: Senator, Faculty Senate
Associate Editor: Journal of Materials Science, Materials Letters, Journal of Phase Equilibria and Diffusion, Integrating Materials and Manufacturing Innovation

Professional Development: N/A

Percentage of time committed to the program: courtesy appointment
Name: Amir Asadi  

Academic Rank and Title: Assistant Professor

Degrees: Ph.D., Mechanical & Manufacturing Engineering, University of Manitoba, 2013  
M.S., Mechanical Engineering, Iran University of Science & Technology, 2006  
B.Sc. in Mechanical Engineering, Iran University of Science & Technology, 2004

Years of Service on Texas A&M Faculty: 2  
Assistant Professor, ETID, Texas A&M (2017-present)

Other Related Experience:  
Postdoctoral fellow, Mechanical Engineering, Georgia Institute of Technology, 2017

State(s) in which registered: N/A

Undergraduate and Graduate Courses Taught: N/A

Recent Graduate Student Advising: N/A

Five Recent Publications


Scientific and Professional Society Memberships/Offices:  
Department representative in Texas A&M Junior faculty Advisory Council  
Member of American Society for Composites and American Society for Mechanical Engineers

Recent Honors and Awards:  
Charlotte and Walter Buchanan Faculty Fellow (2019)  
Texas A&M University and the São Paulo Research Foundation SPRINT award ($20K)  
Best Student Presentation Award in COM 2010 Conference, 2010

Other Recent Professional Activities:  
Consulting: N/A  
Patents: N/A  
Service:  
Member of scientific committee of 5th Brazilian Conference on Composite Materials, 2020
Chair of the sessions of Nanostructured Materials and Additive Manufacturing in the conference of American Society for Composites, 2019
Judge, Career, Research, Innovation and Development Conference at Georgia Tech, 2016

**Professional Development:** N/A

**Percentage of time committed to the program:** courtesy appointment
Name: Shadi Balawi

Academic Rank and Title: Associate Professor of Instruction

Degrees: Ph.D., Aerospace Engineering, University of Cincinnati, 2007
         M.S., Aerospace Engineering, University of Cincinnati, 1999
         M.S., Mechanical Engineering, Jordan U. of Science and Technology, 1997
         B.S., Mechanical Engineering, Jordan U. of Science and Technology, 1994

Years of Service on Texas A&M Faculty: 2
Associate Professor of Instruction (2018-Present)

Other Related Experience:
Assistant Professor, Khalifa University of Science, Technology & Research, 2009-2017
Associate Chair of Aerospace Engineering, Khalifa University of Science, Technology & Research, 2013-2016
Visiting Assistant Professor, American University of Sharjah, 2008-2009
Lecturer, University of South Carolina, 2007-2008
Adjunct Professor, University of Cincinnati, 2000-2007

State(s) in which registered: N/A

Undergraduate and Graduate Courses Taught:
MEEN 225 Engineering Mechanics
MEEN 363 Dynamics and Vibration
MEEN 360 Mechanical Design and Materials and Manufacturing
MEEN 368 Solid Mech in Mec Design
MEEN 401: Intro to Mech Engr Desgn
MEEN 404: Engineering Laboratory
MEEN 475 Materials in Design
MEEN 467/625 Mechanical Behavior and Materials

Recent Graduate Student Advising:
M.S. Students Advised
Shamma Alhumeri (2017- 2019)

Five Recent Publications:
1. AL-Shudeifat MA, Al Hosani H, Saeed AS, Balawi S. “Effect of Unbalance Force Orientation with the
   Crack Opening Direction on the Whirl Response of Cracked Rotors”, Journal of Vibration and
   Acoustics 141 (2), 021001, 2019
2. AL-Shudeifat MA, Al Mehairi A, Saeed AS, Balawi S. “Application of the POD Method for Cracked
   Rotors”, Journal of Computational and Nonlinear Dynamics 13 (11), 111006, 2018
3. Al Mehairi A, AL-Shudeifat MA, Balawi S, Saeed AS. “Application of the POD Method for Cracked
   Rotors”, ASME. International Design Engineering Technical Conferences and Computers and
   Information in Engineering Conference, Volume 6: 13th International Conference on Multibody
   Systems, Nonlinear Dynamics, and Control, Cleveland, Ohio, USA, August 6–9, (2017),
   Cracked Rotor Whirl Response”, ASME. International Design Engineering Technical Conferences and
   Computers and Information in Engineering Conference, Volume 6: 13th International Conference on


Scientific and Professional Society Memberships/Offices:
The American Institute of Aeronautics and Astronautics (AIAA) member
The American Society of Engineering Education (ASEE)
European Society for Composite Materials member
American Society of Mechanical Engineers (ASME) member
European Structural Integrity Society member

Recent Honors and Awards:
2012 Khalifa University, Faculty Excellence Award for outstanding service

Other Recent Professional Activities:
Consulting: N/A

Patents: N/A

Service:
MEEN ABET Committee
MEEN Curriculum Committee
MEEN Lab Committee
MEEN Distance Learning Committee

Professional Development:
Olin College I2E2 Summer Institute 2012
Collaboration Lab planning and setup
IIMCE2 Meeting (Qatar) (2011)
Global Space and Satellite Forum (2011)
The Eye on the Government Workshop (2010)
New campus planning Sasaki workshops
1001 innovations detailed exhibition meetings (2010)
1001 heritage center meeting (2011)
AIAA ASM booth: planning and setup (2011)

Percentage of time committed to the program: 100
Name: Debjyoti Banerjee  
Academic Rank and Title: Professor

Degrees:  
Ph.D., M.S., Mechanical Engineering, University of California, 1999  
M.S., Engineering Science, Computational Science, University of Mississippi, 1995  
B.S. (Honors) Indian Institute of Technology, 1992

Years of Service on Texas A&M Faculty: 15  
Professor (2015-Present)  
Associate Professor, Petroleum Engineering (2014-2015, joint courtesy appointment)  
Associate Professor (2011-2015)  
Assistant Professor (2005-2011)

Other Related Experience:  
Summer Faculty Fellow Office of Naval Research/American Society for Engineering Education (ASEE), Space and Naval Warfare Center (2009)  
Adjunct Lecturer, Santa Clara University Mechanical Engineering Department (2004)  
Senior Fluidics Research Scientist, Ciphergen Biosystems Inc. (2002)  
Senior Applications and Consulting Engineer, Coventor Inc., Applications and Services Division (1999-2002)

State(s) in which registered: N/A

Undergraduate and Graduate Courses Taught:  
MEEN 624 Two Phase Flow and Heat Transfer  
MEEN 621 Fluid Mechanics  
ENGR/PHIL 482 Engineering and Ethics  
MEEN 461 Heat Transfer  
MEEN 404 Engineering Laboratory  
MEEN 401/402 Mechanical Engineering Senior Capstone Design Project  
MEEN 344 Fluid Mechanics  
MEEN 315 Principle of Thermodynamics  
MEEN 227 Principles of Thermodynamics  
MEEN 221 Statics and Particle Dynamics  
MEEN 684 Professional Internship

Recent Graduate Student Advising:  
Ph.D. Students Advised  
M.S. Students Advised  

Five Recent Publications:  

Scientific and Professional Society Memberships/Offices:
Society for Petroleum Engineers member (2009-present)
The Institute of Electrical and Electronics Engineers member (2018-present)
Faculty Senate Member (2013-2019)
Information Technology Governance Program member (2018-2019)
American Physical Society member (2010-2011)
Society for Automotive Engineers member (2006-2010)
American Society for Engineers Education member (2005-2009)
ASME Nanotechnology Institute member
ASME Thermal Energy Storage Open Research Forum

Recent Honors and Awards:
Dean’s Excellence Award, College of Engineering, Texas A&M, 2018
“Pravasi Rattan Award” (Jewel of Expatriate Indians Award) at the House of Commons on April 18 and House of Lords on April 19 (British Parliament, London, UK)
James J. Cain ’51 Faculty Fellow I, College of Engineering, Texas A&M, 2017-2020
Texas New Ventures Competition 5th Prize (overall), “AM Innovation Center Prize” and “Amerra Visualization Services Prize”, 2018
Nominated as “Protégé” for attending the Texas Academy of Medicine, Engineering, Science and Technology, 2017
Selected as the Faculty Advisor for the Student Ambassador Program at Texas A&M by the United States Patent and Trademark Office, 2015-2016
Invited seminar speaker, "Chevron Lecture", Mechanical Engineering Department of the University of Texas at Austin, 2016.
Fellow, American Society for Mechanical Engineers, 2016
Leland T. Jordan Career Development Professor in Mechanical Engineering, 2014-2015
3M Corporation “Non Tenured Faculty Award”, 2009-2012

Other Recent Professional Activities:

Consulting: N/A

Patents: N/A

Service:
ASME Energy Systems Committee member (2008-present)
ASME K-13 Committee member (2008-present)
Micro and Nano Fluid Dynamics Committee (2005-present)
ASME K-12 Committee (2006-present)
ASME K-6 Committee (2009-present)
ASME K-21 Committee (2011-present)
Information Policy Committee (2013-present)
University Safety Committee (2012-present)
Served as a reviewer for TAMU – China Science Foundation program (2011-present)
ASME Thermal Energy Storage Safety Standards Committee (2015-present)
University Faculty Senate Planning Committee (2016-2019)
Texas A&M Stakeholders Operations Committee (2018-2019)
University Budget Information Committee (2014-2017)
University Committee on Academic Freedom, Research and Tenure (2016-2019)
University Faculty Development Leave Committee (2016-2019)
Transportation Services Advisory Committee (2014-2016)
Difficult Dialogues Program Facilitator (2013-present)
Faculty Advisor for Student Ambassador Program of the United States Patent and Trade Mark Office (2015-2016)
Faculty Senate Representative to the Finance Working Group (2015-2016)
Served as a reviewer for Koldus Award, (2015-2016)
Served as a reviewer for Office of Graduate and Professional Studies (OGAPS) for the Graduate Diversity Fellowships award (2015-2016)

Professional Development:
    TAMU Dean of Faculties Workshop (2013)
    TAMU Applied Ethics Initiative Workshop (2013)
    TAMU ADVANCE center (STRIDE) (2015)

Percentage of time committed to the program: 100
Name: Chandler Benjamin  

Academic Rank and Title: Assistant Professor

Degrees:  
Ph.D. Engineering Mechanics, University of Wisconsin, Madison, 2017  
M.S. Engineering Mechanics, University of Wisconsin, Madison, 2013  
B.S. Optical Physics, Saginaw Valley State University, 2011

Years of Service on Texas A&M Faculty: 2  
Assistant Professor (2018-present)  
Assistant Research Professor (2017-2018)

Other Related Experience:  
Research Assistant, University of Wisconsin, Madison (2011-2017)  
Adjunct Physics Instructor, Madison Area Technical College, Madison (2014-2016)

State(s) in which registered: N/A

Undergraduate and Graduate Courses Taught:  
MEEN 368 Solid Mechanics in Design  
CVEN 305 Mechanics of Materials  
PHYS 363 Science I  
PHYS 221 University Physics I  
PHYS 139 Survey of Physics

Recent Graduate Student Advising:  
Ph.D. Students Advised:  
Manoj Myneni, Co-Advising (2017-present), Alexandria Trevino, Co-Advising (2019-present)  
M.S. Students Advised:  

Five Recent Publications:

Scientific and Professional Society Memberships/Offices:
Society of Experimental Mechanics (SEM) (2012-present)
American Physics Society (APS) (2011-present)
Saginaw Valley State University Physics Club, President (2009-2011)

Recent Honors and Awards:
2015 Delta Teaching Certification
2012 National Science Foundation, Graduate Research Fellowship Program (NSF-GRFP)
2012 Society of Experimental Mechanics (SEM)
2011 Graduate Engineering Research Fellow, (GERS) University of Wisconsin, Madison
2011 Sigma-Pi-Sigma (SPS) Society of Physics Students
2011 American Physics Society (APS)
2010 Multi-Cultural Engineering Scholarship
2009 Multi-Cultural Engineering Scholarship

Other Recent Professional Activities:
Consulting: N/A
Patents: N/A
Service:
Nomination packet reviewer for the 2017 Diversity Fellowship – TAMU (2018)
Represented the University of Wisconsin-Madison GERS program at the Emerging Researchers Network (ERN) Conference (2015)
Served as moderator for the University of Wisconsin-Madison Undergraduate Symposium (2014)
Represented the University of Wisconsin-Madison GERS program at the National Society of Black Engineers (NSBE) (2014)
Presented at Opportunities in Engineering (OPPS) program at the University of Wisconsin-Madison (2012-2013)
Mentored undergraduate student for Summer Undergraduate Research Experience (SURE) program at the University of Wisconsin-Madison (2012)

Professional Development:
EPD 690: Effective Teaching with Technology
EPD 654: The College Classroom
CBE 562: Research Mentorship Training

Percentage of time committed to the program: 100
Name: Iman Borazjani  Academic Rank and Title: Associate Professor

Degrees:  Ph.D., Mechanical Engineering, University of Minnesota, 2008
          M.S., Mechanical Engineering, Georgia Institute of Technology, 2005
          B.S, Mechanical Engineering, Sharif University of Technology, 2002

Years of Service on Texas A&M Faculty: 2
          Associate Professor (01/2018-present)

Other Related Experience:
          Associate Professor, University at Buffalo (UB), SUNY (2016-2018)
          Assistant Professor, University at Buffalo (UB), SUNY (2010-2016)
          Postdoctoral Research Associate, University of Minnesota, (2008-2010)

State(s) in which registered: N/A

Undergraduate and Graduate Courses Taught:
          MEEN 489/689 Computational Fluid Dynamics
          MEEN 344 Fluid Mechanics

Recent Graduate Student Advising:
          Ph.D. Students Advised
          Hafez Asgharzadeh 2017, Mohsen Daghooghi, 2015
          M.S. Students Advised

Five Recent Publications:

Scientific and Professional Society Memberships/Offices:
          American Physical Society (APS)
          American Society of Mechanical Engineers (ASME)
          American Heart Association (AHA)
Recent Honors and Awards:
Fulbright Scholar (2017–18)
UB Exceptional Scholars Young Investigator Award (2015), University at Buffalo (UB), State University of New York
Early CAREER award (2015), National Science Foundation
Doctoral New Investigator award (2013), American Chemical Society
Scientific Development award (2013), American Heart Association

Other Recent Professional Activities:
Consulting: N/A

Patents:
Borazjani, I., and Karami, M. A., provisional patent (United States of America provisional patent application on said invention, filed as U.S. Patent Application No. 62/863,365 on June 19, 2019 (Attorney’s File No. 2238-14000) and entitled “TRAVELING WAVE ACTUATORS FOR FLOW CONTROL;”).

Service:
TAMU Honors Committee (2018-9)
TAMU Strategic Planning Committee (2019)
TAMU Faculty Mentoring and Onboarding Committee (2019)
TAMU CAREER Workshop panel (2018)
UB SEAS Tenure Committee Alternate (2017)
UB Graduate Committee Member (2012-2013, 2015)
UB Oral MSc Examiner (2012, 2014-present)
UB Ph.D. Qualifier Examiner (2012-present)
UB Co-organizer of the MAE seminar series (2012-2015)
UB Poster Competition Judge (2013)
UB Sigma Xi graduate poster judge (2014)
UB Panelist, New faculty research orientation (2016)

Professional Development: N/A

Percentage of time committed to the program: 100
Name: Jerald Caton  

Academic Rank and Title: Professor

Degrees:
- Ph.D. Massachusetts Institute of Technology, 1980
- M.S. University of California, Berkeley (with honors), 1973
- B.S. University of California, Berkeley (with honors), 1972
- A.S. Merced Junior College, 1969

Years of Service on Texas A&M Faculty: 40
- Professor (06/2007-present)
- Professor/Interim Associate Department Head (2018-2019)
- Professor and Interim Department Head, (2011-2012)
- Professor, Associate Department Head, Research Program Coordinator (2006-2013)
- Professor and Director of the Graduate Program (1994-1998)
- Professor and Interim Department Head (1996-1997)
- Professor (1991-1994)
- Associate Professor (1985-1991)
- Assistant Professor (1979-1985)

Other Related Experience:

State(s) in which registered:
- Professional Engineering – Texas, No. 47654 (1980-Present)

Undergraduate and Graduate Courses Taught:
- MEEN 327 Thermodynamics I
- MEEN 410 I. C. Engines
- MEEN 461 Heat Transfer
- MEEN 328 Thermodynamics II
- MEEN 481 Seminar
- MEEN 615 Advanced Thermodynamics
- MEEN 344 Fluid Mechanics
- MEEN 404 Engineering Lab
- MEEN 405 Combustion
- MEEN 663 Cogeneration
- MEEN 445 Design (II)
- MEEN 446 Design (II)
- ENGR 212 Thermodynamics I
- MEEN 421 Thermal Fluids
- MEEN 681 Graduate Seminar
- ENGR 385/484 Co-Op Students
- MEEN 611 I.C. Engines
- MEEN 463 Cogeneration

Recent Graduate Student Advising:
- Ph.D. Students Advised
- M.S. Students Advised
Five Recent Publications:

Scientific and Professional Society Memberships/Offices:
- American Chemical Society, Member (1989–Present)
- American Society of Engineering Education, Life Member (1982–Present)
  - Elected Life Member (May 2017)
- American Society of Mechanical Engineers, Life Fellow (1973–Present):
  - Chair, History and Heritage Liaison (2014–Present)
  - Chair, Nominating Committee, ICE Division (2010–present)
  - Chair, Best Technical Paper Award Committee, ICE Division (2005–present)
  - Member, Best Technical Paper Award Committee, ICE Division (1999–present)
- Member of Associates Committee (1982–Present)
- Combustion Institute, Member (1973–Present)
- Program Review Subcommittee, International Symposium on Society of Automotive Engineers, Fellow (1979–Present)
  - Elected Fellow (November 2006)
- Member of Teetor Educational Awards Committee (2001 – 2009)
- Member of Readers Committee (1982–Present)

Recent Honors and Awards:
- TAMU – COE: Charles Crawford Distinguished Service Award (2016)
- ASME–ICE Meritorious Service Award (2010)
- SAE Excellence in Oral Presentation Award (2009)
- Distinguished Achievement Award – Teaching, Association of Former Students and Texas A&M University (2008)
- Gulf Oil/Thomas A. Dietz Professorship (2007 – present)
- SAE Fellow (2007 – present)

Other Recent Professional Activities:
Consulting:
- University of Keimyung, Daegu, Korea, 2005.
Patents:

Service:
Mechanical Engineering (ME) Zachry Transition Ad-hoc Committee (2018)
ME Laboratory Committee (2015-2019)
ME Ad-Hoc Committee to review candidates for endowed positions (2017)
ME Distance Learning Committee (2016-2018)
ME Ad-Hoc Committee to review faculty fellowships (2016)
ME Thermodynamics Qualifying Exam Committee (2015)
College of Engineering Tenure and Promotion Review Committee (2014-2015)
ME Committee, Simmang Thompson Caddess Award (2014)
ME Advisory Committee (2013-2016)
ME Post-Tenure Peer Review Committee (2013-2019)
ME Named Faculty Appointments Committee (2013-2015)
Mentor Committee for Dr. Partha Mukherjee (2013)
Mentor Committee for Dr. Andrea Strzelec (2013)
Interim Department Head of Mechanical Engineering (2011-2012)
Department of Mechanical Engineering Head Search Advisory Committee (2011)
Mentor Committee for Dr. Sy-Bor Wen (2010)
ME Advisory Committee (2010-2012)
ME Tenure and Promotion Committee (2010-2011)
Mentor Committee for Dr. Nicole Zacharia (2009-2013)

Professional Development: N/A

Percentage of time committed to the program: 100
Name: Ploy Charoenphol

Academic Rank and Title: Research Assistant Professor

Degrees: Ph.D., Chemical Engineering, University of Michigan, 2012
         M.S., Chemical Engineering, University of Michigan, 2008
         B.S., Chemical Engineering, Chulalongkorn University, 2006

Years of Service on Texas A&M Faculty: 5
         Research Assistant Professor (2014-Present)

Other Related Experience:
         Visiting Postdoctoral Researcher, University of Michigan, Ann Arbor (2014)
         Postdoctoral Fellow, University of Massachusetts, Amherst (2012-2014)

State(s) in which registered: N/A

Undergraduate and Graduate Courses Taught:
         MEEN 315 Principle of Thermodynamics
         MEEN 344 Fluid Mechanics
         MEEN 404 Engineering Laboratory

Recent Graduate Student Advising:
         Ph.D. Students Advising
         Jorge Palma-Chavez (Expected 2019)
         M.S. Students Advising
         Kevin Fuentes (Expected 2020)

Five Recent Publications:

Scientific and Professional Society Memberships/Offices:
         American Heart Association (AHA), member (2016 – present)
         Biomedical Engineering Society (BMEs), member (2016 – present)

Recent Honors and Awards:
         American Heart Association Scientist Development Award (2017)
         Selected nominee for Pre-doctoral Fellowship, University of Michigan Rackham (2011-2012)
Travel Fellowship, University of Michigan (2008-2011)

Other Recent Professional Activities:

Consulting: N/A

Patents: N/A

Service:

Peer Review Activities
Proposal review panelist (Bioengineering study section), American Heart Association, 2016 - 2017
  - Nature Scientific Reports
  - PLOS One

Departmental Services
Member of MEEN shared service committee, Sep 2018 – present
  - Member of MEEN seminar committee, Sep 2017 – Aug 2018

University Services
Advisor of Thai Student Association at Texas A&M University, Sep 2016– present

Professional Development: N/A

Percentage of time committed to the program: 100
Name: David Claridge  
**Academic Rank and Title:** Professor

**Degrees:**
- Ph.D., Stanford University, 1976
- M.S., Stanford University, 1966
- B.S., Walla Walla College, 1964

**Years of Service on Texas A&M Faculty:** 33
- Director, Energy Systems Laboratory, Texas Engineering Experiment Station (2007 – Present)
- Leland Jordan Professor (2005 – 2018)
- Senior Fellow, Texas Engineering Experiment Station, (1999 – Present)
- Professor, (1995 – Present)
- Deputy Director, Energy Systems Laboratory, Texas Engineering Experiment Station, (2007)
- E.D. Brockett Professor, College of Engineering (2001 – 2002)
- Northrup Grumman Fellow, College of Engineering (2000 – 2001)
- Visiting Erskine Fellow, Canterbury University, Christchurch, New Zealand (2000)
- Fellow, Texas Engineering Experiment Station, (1997 - 1999)
- Dresser Industries Professor, College of Engineering (1996 – 1997)
- Associate Professor (1986 - 1995)

**Other Related Experience:**
- Associate Professor of Civil, Environmental & Architectural Engineering, University of Colorado, Boulder (1982 - 1986)

**State(s) in which registered:**
- Professional Engineer (Mechanical) State of Texas, 1991

**Undergraduate and Graduate Courses Taught:**
- MEEN 664 Energy Management in Commercial Buildings
- MEEN 665 Applications of Energy Management
- ICPE 622 Energy Efficiency in Buildings

**Recent Graduate Student Advising:**
- Ph.D. Students Advised
- M.S. Students Advised

**Five Recent Publications:**


Scientific and Professional Society Memberships/Offices:
ASHRAE (formerly American Society of Heating, Refrigerating, and Air Conditioning Engineers) (Fellow) (1981-present) President of College of Fellows
American Society of Mechanical Engineers (Fellow) (1986 – present)
American Solar Energy Society member (1980-present)

Recent Honors and Awards:
ASME Fellow, 2001
E. D. Brockett Professor, Texas A&M University College of Engineering, 2001–2002
Association of Former Students Distinguished Achievement in Research Award, 2003
ASHRAE Fellow, 2008
Honorary International Member, Society of Heating, Air-Conditioning and Sanitary Engineers of Japan, 2011

Other Recent Professional Activities:

Consulting:
Global Energy Partners, 2003
Pacific Energy Center, 1998

Patents:

Service:
Graduate Thermodynamics Ph.D. Qualifying Exam Committee 2005-2016
Architectural Engineering Program Development Committee, 2014-present
TEES Research Professors Advisory Committee, 2014-present
Honors and Awards Committee, 2014 - present
Graduate Committee, 2007-2009
Journal of Building Performance Simulation Editorial Board, 2008 - present

Professional Development: N/A

Percentage of time committed to the program: 100
Name: Dale Cope  

**Academic Rank and Title:** Associate Professor of Practice

**Degrees:**
- Ph.D., Aerospace Engineering, Wichita State University, 2002
- M.S., Aeronautical Engineering, Air Force Institute of Technology, 1988
- B.S., Aerospace Engineering, Texas A&M University 1982

**Years of Service on Texas A&M Faculty:** 4 Years
- Associate Professor of Practice (2015-Present)
- Director of Industry Assistance, Texas A&M Engineering Experiment Station (2013-2015)

**Other Related Experience:**
- Program Manager, Aerospace Structures, Southwest Research Institute (2007-2013)
- Senior Research Scientist, National Institute for Aviation Research (2002-2007)
- Aircraft Maintenance Office, 184th Wing, Kansas Air National Guard (2000-2007)
- Company Grade Officer, United States Air Force (1983-1995)

**State(s) in which registered:** N/A

**Undergraduate and Graduate Courses Taught:**
- Statics, Dynamics, Engineering Mechanics, Mechanics of Materials,
- Solid Mechanics in Mechanical Design, Senior Design

**Recent Graduate Student Advising:** N/A

**Five Recent Publications:**


**Scientific and Professional Society Memberships/Offices:**
- American Society for Engineering Education
Recent Honors and Awards:
   ASME Best Teacher Award, 2018
   Associate Fellow, American Institute of Aeronautics and Astronautics (AIAA), 2012

Other Recent Professional Activities:

   Consulting: N/A
   Patents: N/A
   Service: N/A
   Professional Development: N/A

Percentage of time committed to the program: 100
Name: Carlos Corleto  Academic Rank and Title: Professor of Practice

Degrees:  Ph.D., Mechanical Engineering, Texas A&M University, 1990  
M.S., Mechanical Engineering, Texas A&M University, 1986  
B.S., Mechanical Engineering, Texas A&M University, 1984

Years of Service on Texas A&M Faculty: 1  
Professor of Practice, (08/2018-Present)

Other Related Experience:  
Materials Lab Director & Senior Mechanical Consultant, Knighthawk Engineering Inc., (01/2010-08/2018)  
Manager, Total Petrochemicals USA, La Porte, TX (01/2007-08/2009)  
Senior Engineering Advisor (1999 – 2007)  
Associate/Assistant/Visiting Professor, Texas A&M Kingsville, TX (1991-1998)

State(s) in which registered:  
Licensed Professional Engineer in the State of Texas – P.E. # 130584

Undergraduate and Graduate Courses Taught:  
MEEN 221 Statics and Particle Dynamics  
MEEN 225 Engineering Mechanics  
MEEN 357 Engineering Analysis for Mechanical Engineers  
MEEN 360 Materials and Manufacturing Selection in Design  
MEEN 475 Materials in Design  
MEEN 402 Intermediate Design Studio

Recent Graduate Student Advising: N/A

Five Recent Publications:

Scientific and Professional Society Memberships/Offices:  
American Society of Mechanical Engineers (ASME)
Recent Honors and Awards: N/A

Other Recent Professional Activities:

Consulting:
KnightHawk Engineering, Inc. 9/18/2018 - Present

Patents:

Service: N/A

Professional Development: N/A

Percentage of time committed to the program: 100
Name: Swaroop Darbha  
Academic Rank and Title: Professor

Degrees:  
Ph.D., University of California at Berkeley, 1994
M.S. in Mechanical Engineering, University of California at Berkeley, 1992
B.Tech. in Mechanical Engineering, Indian Institute of Technology, 1989

Years of Service on Texas A&M Faculty: 23  
Professor, (09/2009-present)  
Associate Research Engineer, Texas Transportation Institute (09/2003-present)  
Professor, Qatar, Dept. of Mechanical Engineering (01/2014-12/2016)  
Associate Professor, (09/2003-08/2009)  
Assistant Professor, (01/1997-08/2003)

Other Related Experience:  
Visiting Summer Faculty Researcher, Air Force Research Laboratory, Wright Patterson Air Force Base, (05/2009-08/2009)  
Visiting Summer Faculty Researcher, Air Force Research Laboratory, Wright Patterson Air Force Base, (05/2008-08/2008)  
Visiting Scientist, Air Force Research Laboratory, Wright Patterson Air Force Base, (01/2006-12/2016)  
ASEE/AFOSR Summer Faculty Fellow, Air Force Research Laboratory, Eglin Air Force Base, (05/2005-08/2005)  
Visiting Summer Faculty Researcher, Air Force Research Laboratory, Wright Patterson Air Force Base, ASEE/AFOSR Summer Faculty Fellow, Air Force Research Laboratory, Wright Patterson Air Force Base, (05/2000-08/2000)  
General Engineer, Volpe National Transportation Center, (06/1998-08/1998)  
Postdoctoral Researcher, California PATH, Institute for Transportation Studies, UC Berkeley (04/1995-12/1996)

State(s) in which registered: N/A

Undergraduate and Graduate Courses Taught:  
ENGR 112 Introduction to Engineering  
MEEN 221 Statics and Dynamics  
MEEN 335 Mechanical Systems II  
MEEN 357 Engineering Analysis for Mechanical Engineers  
MEEN 363 Dynamics and Vibrations  
MEEN 364 Dynamics Systems and Control  
MEEN 401 Mechanical Engineering Design I  
MEEN 402 Mechanical Engineering Design II  
MEEN 408 Introduction to Robotics  
MEEN 411 Mechanics Controls  
MEEN 431 Advanced Dynamics and Controls  
MEEN 432 Automobile Engineering  
MEEN 441 Design of Machine Components and System  
MEEN 459 Sound and Vibration  
MEEN 612 Mechanics of Robotic Manipulators  
MEEN 651 Control Systems Design  
MEEN 655 Nonlinear Control System Design
MEEN 689 Convex Optimization Methods for Control System Design

Recent Graduate Student Advising:

Five Recent Publications:

Scientific and Professional Society Memberships/Offices:
American Society for Mechanical Engineers (ASME), Fellow
Institute for Electrical and Electronics Engineers (IEEE), Fellow

Recent Honors and Awards:
Faculty co-advisor, SAE/GM Autodrive Challenge Team winning 2nd prize overall and 1st prize, 2018
Fellow, IEEE, 2018 - for contributions to Intelligent Transportation Systems and Unmanned Vehicles Best Paper Award (Joint with Gupta Manyam, Siva Rathinam and David Casbeer), IEEE International Conference on Unmanned Aircraft Systems, 2014.
Fellow, ASME, 2010 - for contributions to Intelligent Transportation Systems and Unmanned Vehicles. The Association of Former Students' Distinguished Achievement Award, 2009.
Tenneco Award for Meritorious Teaching of Engineering, 2009.
Texas A&M University College of Engineering Faculty Fellow, 2009.

Other Recent Professional Activities:
Service:
Associate Editor, IEEE Transactions on Intelligent Transportation Systems, 2018-present
Associate Editor, Differential Equations and Nonlinear Mechanics, 2005 - 2010.
Associate Editor, Conference Editorial Board, ASME Dynamic Systems and Control
Conference, 2008 - 2010.
Reviewer for Indiana21 State Fund.
Reviewer, US-Ukraine Cooperative Research Program.
Reviewer, Institute for Transportation Studies, University of Minnesota.
Member, Graduate Studies Committee, 2012 - 2013.
Member, Graduate Curriculum Review Committee, 2012- 2013.
Theses committee member of several doctoral students from MEEN and AEEN.
Member, Faculty Area SubCommittee (FASC), Department of Mechanical Engineering, TAMUQ, 2014- 2015.
Member, Graduate Studies Research Committee, Department of Mechanical Engineering, TAMU, 2016-2018.
Member, Mentoring and On-boarding Committee, Department of Mechanical Engineering, 2016- 2017.
Member, Faculty Search Committee, Department of Mechanical Engineering, 2016-2018.
Member, Faculty Advisory Committee, Department of Mechanical Engineering, 2017-current.
ABET Departmental Coordinator, 2018- current.
Member, College-Level Honors and Awards Committee for Research, Teaching and Service, 2011-2012.
Faculty Senator, 2011 - 2014.
Faculty Adviser, AID-TAMU, 2001-2011.
Departmental Representative, College-Level Tenure & Promotion at TAMUQ, 2014.
Member, TAMUQ Dean Search Committee, 2014 - 2015

**Professional Development:** N/A

**Percentage of time committed to the program:** 100

**Name:** Adolfo Delgado **Academic Rank and Title:** Associate Professor

**Degrees:**
- Ph.D. in Mechanical Engineering, Texas A&M University, 2008
- M.S. in Mechanical Engineering, Texas A&M University, 2005
- B.Sc. in Mechanical Engineering, Universidad Simón Bolívar, Venezuela, 2002

**Years of Service on Texas A&M Faculty:** 3
- Associate Professor 2016-present)
- Research Assistant, Texas A&M Turbomachinery Laboratory (2003-2008)

**Other Related Experience:**
- Lead Mechanical Engineer, General Electric Global Research Center, (2012-2016)
- Mechanical Engineer, General Electric Global Research Center, (2009-2012)

**State(s) in which registered:** N/A

**Undergraduate and Graduate Courses Taught:**
Recent Graduate Student Advising:
Ph.D. Students Advised:
M.S. Students Advised:
Joshua Vandervort (2018-present), Andrew Moody (2019-present)

Five Recent Publications:

Scientific and Professional Society Memberships/Offices:
ASME Member

Recent Honors and Awards:
2011 Best Paper Award Rotordynamics, Dynamics & Structures Division, ASME IGTI

Other Recent Professional Activities:

Consulting: N/A

Patents:

Service:
Active reviewer (ASME, STLE, Elsevier journals)
Bearings and Seals Technical Session Chair of IGTI/ASME Turbo Expo Conference from 2013 through 2019 (9 sessions)

Professional Development:
Faculty Development Workshop organized by the Society of Hispanic Professional Engineers, Faculty Development Institute (2017)
Roadmap Workshop for a Successful Academic Career – Organized by Dean of Faculties Office (2017)

Percentage of time committed to the program: 100
Name: Jonathan Felts  

Academic Rank and Title: Assistant Professor

Degrees:  
Ph.D., Mechanical Engineering, University of Illinois, Urbana-Champaign, 2013  
M.S., Mechanical Engineering, University of Illinois, Urbana-Champaign, 2009  
B.S., Mechanical Engineering, Georgia Institute of Technology, 2008

Years of Service on Texas A&M Faculty: 5  
Assistant Professor, Texas A&M (2014-present)

Other Related Experience:  
National Academy of Science Postdoctoral Fellow, Naval Research Laboratory, (2013-2014)

State(s) in which registered: N/A

Undergraduate and Graduate Courses Taught:  
MEEN 630 Intermediate Heat Transfer  
MEEN 461 Heat Transfer  
MEEN 461 Honors Heat Transfer  
MEEN 344 Fluid Mechanics

Recent Graduate Student Advising:  
Ph.D. Students Advised  
Shivaranjan Raghuraman, Mohammadreza Soleymaniha, Achutha Tamraparni, Perawat Boonpuek  
M.S. Students Advised  
Holly Higgins

Five Recent Publications:  

Scientific and Professional Society Memberships/Offices:  
Member of Pi Tau Sigma National Honor Society  
Member of Tau Beta Pi National Honor Society

Recent Honors and Awards:  
Award funded by the Office of Naval Research (ONR) with funds reserved for most distinguished Postdoctoral Fellows.
Department of Energy Office of Science Graduate Fellow (2010-2013)
Recipient of the Eugene and Lina Abraham Fellowship Award, UIUC (2010)

Other Recent Professional Activities:

Consulting: N/A

Patents:

Service:
Conference Session Chairs:
American Vacuum Society 65th International Symposium - Co-chair for Extending Additive Manufacturing to the Atomic Scale, 2018
American Society of Mechanical Engineers 10th International Conference on Micro- and Nanosystems - Co-chair for AFM Dynamics, 2016
North American Thermal Analysis Society - Chair for Local Thermal Analysis, 2015
Society of Engineering Science - Session Chair for Mechanics of 2D materials, 2015

Professional Development: N/A

Percentage of time committed to the program: 100
Name: Alan Freed  

**Academic Rank and Title:** Professor

**Degrees:**
- Ph.D., Engineering Mechanics, University of Wisconsin - Madison, 1985
- M.S., Engineering Mechanics, University of Wisconsin - Madison, 1980
- B.S., Engineering Mechanics, University of Wisconsin - Madison, 1978

**Years of Service on Texas A&M Faculty:** 5
- Professor (09/2014-present)

**Other Related Experience:**
- 11/18-present: Joint Faculty Appointment with the Army Research Office, Development and Engineering Command, Army Research Laboratory, Weapons and Materials Research Directorate, Protection Division, Impact Physics Branch, Aberdeen, MD
  - 07/07-07/14: Clifford H. Spicer Endowed Chair in Engineering, Saginaw Valley State University
  - 12/01-07/07: Adjunct Staff, Department of Biomedical Engineering, Lerner Research Institute, The Cleveland Clinic, Cleveland, Ohio.
- 10/96-06/07: Senior Materials Research Engineer, NASA John H. Glenn Research Center at Lewis Field
- 07/85-09/96: Materials Research Engineer, NASA Lewis Research, Center
- 03/89-06/89: Sabbatical leave: Office National d’Etudes et de Recherches Aérospatiales, Châtillon, Cedex, France.
- 09/84-06/85: Assistant Professor of Mechanical Engineering, University of New Hampshire in Durham.

**State(s) in which registered:**
None

**Undergraduate and Graduate Courses Taught:**
- MEEN 357 Geometric Modeling for Mechanical Design
- MEEN 445/645 Mechanics of Compliant Materials

**Recent Graduate Student Advising:**
- Ph.D. Students Advised:
- M.S. Students Advised:

**Five Recent Publications:**


**Scientific and Professional Society Memberships/Offices:**

Fellow: American Society of Mechanical Engineers
Member: Society of Engineering Science
Member: Society for Industrial and Applied Mathematics
07/95-06/96: Chair, Materials Division, ASME
07/95-06/96: Chair, Metallic Materials Technical Committee, ASME
07/91-06/95: Executive Committee Member, Materials Division, ASME

**Recent Honors and Awards:**

2016: Brittan Undergraduate Teaching Award, Dept. Mech. Engr., Texas A&M
07-14: Clifford H. Spicer Endowed Chair in Engineering, SVSU
2006: Cleveland Clinic Innovator Award
2004: Metal, NASA, Exceptional Service

**Other Recent Professional Activities:**

**Consulting:**


**Patents:**


**Service:**


**Professional Development:** N/A

**Percentage of time committed to the program:** 100
Name: Sharath Girimaji  Academic Rank and Title: Department Head and Professor

Degrees:  Ph.D., Cornell University, 1990
         M.S., Cornell University, 1986
         B.Tech., Indian Institute of Technology, 1983

Years of Service on Texas A&M Faculty: 20
         Professor (2005-present)
         Associate Professor (2005-2010)

Other Related Experience:
   Visiting Scientist, Argonne National Lab (1999)
   Staff Scientist, AS&M Inc., NASA Langley (1990-1992)

State(s) in which registered:

Undergraduate and Graduate Courses Taught:

Recent Graduate Student Advising:

Five Recent Publications

Scientific and Professional Society Memberships/Offices:
   Fellow, American Physical Society
   Associate Fellow, American Institute of Aeronautics and Astronautics

Recent Honors and Awards:
   2010 Texas Engineering Experiment Station Fellow, Texas A&M
   2007 Dow Chemical Fellow, Texas A&M
   2006 Brockett Professor, Texas A&M
   2006 Texas Engineering Experiment Station Fellow, Texas A&M
   2001 Texas Engineering Experiment Station Special Research Fellow, Texas A&M

Other Recent Professional Activities:
   Consulting:
   Patents:
   Service:
Professional Development:

Percentage of time committed to the program: courtesy appointment
Name: Sevan Goenezen  Academic Rank and Title: Assistant Professor

Degrees:  Ph.D. Rensselaer Polytechnic Institute, Troy, 2011
          B.S./M.S. Rheinisch-Westfaelische Technische Hochschule Aachen, 2006

Years of Service on Texas A&M Faculty: 6
          Assistant Professor, (2013-present)

Other Related Experience:
          Oregon Health & Science University, Postdoctoral Researcher (2011-2013)

State(s) in which registered: N/A

Undergraduate and Graduate Courses Taught:
          MEEN 401 Introduction to Mechanical Engineering Design
          ENGR 401 Interdisciplinary Design
          CVEN 305 Mechanics of Materials
          MEEN 603 Theory of Elasticity
          MEEN 368 Solid Mechanics in Design
          MEEN 603 Theory of Elasticity
          MEEN 368 Solid Mechanics and Design
          MEEN 602 Modeling and Analysis of Mechanical Systems
          MEEN 221 Statics and Particle Dynamics

Recent Graduate Student Advising:
          Ph.D. Students Advised:
          M.S. Students Advised:

Five Recent Publications:

Scientific and Professional Society Memberships/Offices:
American Heart Association: Council on Arteriosclerosis, Thrombosis and Vascular Biology - Council Member
Sigma Xi, The Scientific Research Society - Full Membership
American Society of Mechanical Engineers (ASME) 
Materials Research Society (MRS)

Recent Honors and Awards:
Office of Naval Research, Summer Faculty Fellowship 2016 at U.S. Naval Research Lab
Research Initiation Grant Award sponsored by the Haythornthwaite Foundation and organized by the ASME Applied Mechanics Division, 2014
Southeastern Conference (SEC) Visiting Faculty Travel Grant, 2014
Travel Award for the 12th U.S. National Congress on Computational Mechanics, 2013
Lemelson-MIT-Rensselaer Student Prize Finalist 2011
www.eng.rpi.edu/lemelson/finalist_goenezen.cfm
Best Presentation Award 2010/2011 (third place), Graduate Research Forum at RPI
Award winning for mentoring high school students at EurekaFestival and Museum of Sciences “Wind Turbine Contest” and setting new record time, 2011

Other Recent Professional Activities:

Consulting: N/A

Patents: N/A

Service:
Session Chair at the American Society of Mechanical Engineers International Mechanical Engineering Congress and Exposition in Mini-Symposium "Symposium on Modeling of the Fracture, Failure and Fatigue in Solids, 2018
Organized a Mini-Symposium, 13th World Congress in Computational Mechanics on Computational Modeling of Structure-Function Relationships in Biological Systems, 2018
Session Chair at the American Society of Mechanical Engineers International Mechanical Engineering Congress and Exposition in Mini-Symposium on Advanced Manufacturing: Process Modeling, 2017
Session Chair at the American Society of Mechanical Engineers International Mechanical Engineering Congress and Exposition in Mini-Symposium on 3rd Forum on Multiphase Flow with Bio-applications 2, 2017
Session Chair at the American Society of Mechanical Engineers International Mechanical Engineering Congress and Exposition in Mini-Symposium, on Mechanical Characterization of Soft Materials, 2017
Session Chair at the 13th US National Congress on Computational Mechanics, 2015
Session Chair at the American Society of Mechanical Engineers McMAT, 2015
Organized a Mini-Symposium, American Society of Mechanical Engineers McMAT on Modeling of Vascular Tissues, 2015
Session Chair at the Society of Engineering Science Annual Technical Meeting, 2014
Ph.D. Committee Member
M.S. Committee Member
Mentoring high school students at EurekaFestival and Museum of Sciences Wind Turbine Contest and setting new record time, 2011
Development of inverse algorithms to diagnose breast cancer using ultrasound techniques with 90% accuracy tested on patients, 2011
Reviewing journal articles in various biomechanical and mechanical engineering journals

**Professional Development:** N/A

**Percentage of time committed to the program:** 100
Name: Swaminathan Gopalswamy

**Academic Rank and Title:** Research Professor

**Degrees:**
- Ph.D. Mechanical Engineering, University of California, Berkeley, 1991
- M.S. Mechanical Engineering, University of California, Berkeley, 1989
- B.Tech— Mechanical Engineering, Indian Institute of Technology, 1987

**Years of Service on Texas A&M Faculty:** 3
- Research Professor (2019-present)
- Professor of Practice (2016-2019)
- Director, Connected Autonomous Safe Transportation Program, (2017-present)
- Co-Director, Center for Autonomous Vehicles and Sensor Systems (2017-present)

**Other Related Experience:**
- Founder and Principle, Engineered Mechatronics Inc. (2014-present)
- LMS Vice President, MBSE Bus Dev, MBSE Controls, Siemens PL (2013-2014)
- Vice President, MBSE Bus Dev, MBSE Controls, LMS International (2010-2012)
- Founder and CEO, Emmeskay Inc. (1998-2010)
- Staff Research Engineer, GM R&D Center (1992-1998)

**State(s) in which registered:** N/A

**Undergraduate and Graduate Courses Taught:**
- MEEN 402 Senior Capstone

**Recent Graduate Student Advising:** N/A

**Five Recent Publications:**
4. Swaminathan Gopalswamy and Sivakumar Rathinam, “Infrastructure Enabled Autonomy: A Distributed Intelligence Architecture for Autonomous Vehicles”, 29th IEEE Intelligent Vehicles Symposium, Chang Shu, China, June 2018

**Scientific and Professional Society Memberships/Offices:** N/A

**Recent Honors and Awards:** N/A

**Other Recent Professional Activities:**
- **Consulting:** N/A
Patents: N/A

Service:
Director of the Connected, Autonomous, Safe Transportation (CAST) Program
Guest-Editor, Focused Section on “Mechatronics in Cyber-Physical Systems (MCPS)”, IEEE/ASME Transactions on Mechatronics, December 2018

Professional Development: N/A

Percentage of time committed to the program: 50
Name: Jaime Grunlan  Academic Rank and Title: Linda & Ralph Schmidt '68 Professor

Degrees:  Ph.D., University of Minnesota, 2001  
          B.S., North Dakota State University, 1997

Years of Service on Texas A&M Faculty: 15
  Professor (09/2014-present)
  Associate Professor (09/2010-08/2014)
  Assistant Professor (07/2004-07/2010)

Other Related Experience:
  Honorary Visiting Professor, University of Exeter, Exeter, UK (09/2012-11/2015)
  Senior Research Engineer, Avery Research Center, Pasadena, CA (06/2001-07/2004)
  Adjunct Professor, Azusa Pacific University, Azusa, CA (08/2002-12/2003)
  Adjunct Professor, Biola University, La Mirada, CA (01/2002-05/2002)

State(s) in which registered: N/A

Undergraduate and Graduate Courses Taught:
  Polymer Processing and Characterization (MEEN 458)
  Materials Engineering (MEEN 222)

Recent Graduate Student Advising:
  Ph.D. Students Advising:
    Hsu-Cheng Chiang (Expected 2022), Carolyn Long (Expected 2021), Thomas Kolibaba (Expected 2021), Daniel Stevens (Expected 2020), Simone Lazar (Expected 2020), Shuang Qin (Expected 2019), Ryan Smith (Chemistry 2018), Yixuan Song (Materials Science and Engineering 2018), Merid Haile (Materials Science and Engineering 2016), Kevin Holder (Materials Science and Engineering 2016), Tyler Guin (Chemical Engineering 2015), Bart Stevens (Mechanical Engineering 2015), Fangming Xiang (Mechanical Engineering 2015), Ping Tzeng (Chemical Engineering 2015), David Hagen (Mechanical Engineering 2015), Amanda Cain (Materials Science and Engineering 2014)

Five Recent Publications:

Scientific and Professional Society Memberships/Offices:
American Chemical Society (1996 – present)
American Society for Engineering Education (2005 – present)
American Society of Mechanical Engineers (2006 – present)

Recent Honors and Awards:
National Academy of Inventors, Senior Member, 2019
Doctor honoris causa, University of South Brittany, France, 2018
ASME Fellow, 2018
Texas A&M Engineering Experiment Station Senior Faculty Fellow, 2016
Linda & Ralph Schmidt ’68 Professorship, 2015 – present
Dean of Engineering Excellence Award, 2015
Evonik Industries’ ECRP, 1st Place Prize, 2014
Texas A&M Engineering Experiment Station Faculty Fellow, 2014
E. D. Brockett Professorship, 2013
L.E. Scriven Young Investigator Award (sponsored by ISCST), 2012
Gulf Oil/Thomas A. Dietz Development Professor I, 2011 – 2014
Carl Dahlquist Award, 2010
Dow Young Faculty Award, 2009
TEES Select Young Faculty, 2007
NSF CAREER, 2007-2012
3M Untenured Faculty Grant, 2007-2010

Other Recent Professional Activities:

Consulting: N/A

Patents:
E. J. Schindelholz, E. D. Spoerke, N. R. Sorensen, J. C. Grunlan, “Nanocomposite
Grunlan, “Nanocomposite Barrier Films for Photovoltaic Applications,” U.S. Patent 10,002,983 (issued
June 19, 2018).
J. C. Grunlan, “Aqueous Polyelectrolyte Complex as One Pot Nanocoating Solution to
Impart Antiflammable Behavior to Various Substrates,” U.S. Patent 9,840,629 (issued
December 12, 2017).
J. C. Grunlan “Multilayer coating for flame retardant substrates,” U.S. Patent 9,540,764, (issued January
10, 2017).
J. C. Grunlan “Multilayer coating for flame retardant foam or fabric,” U.S. Patent 9,540,763, (issued
January 10, 2017).
J. C. Grunlan “Multilayer coating for flame retardant substrates,” U.S. Patent 9,539,612, (issued January
10, 2017).
(issued September 15, 2016).
October 20, 2015).

Service:
Materials Research Society (MRS): Lead Organizer for MRS Symposium R – Transport Behavior in Heterogeneous Polymeric Materials and Composites (Spring 2007); Lead Organizer for MRS Symposium KK – Transport Properties in Polymer Nanocomposites (Fall 2008); Lead Organizer for MRS Symposium DD – Transport Properties in Polymer Nanocomposites II (Fall 2011)
National Science Foundation (NSF): CMMI NanoManufacturing Panels (2006; 2008); Site Visitor for Center for Hierarchical Manufacturing (CHM) at UMass – Amherst (2012); External Advisory Board Member for University of Texas – El Paso’s Partnership for Research in Engineering and Materials (PREM) (2016 – present)
Polymer Chemistry (POLY) Division of the American Chemical Society (ACS): Lead Organizer for Electrical, Thermal and Mass Transport in Polymer Nanocomposites and Alloys symposium (March 2015); Organizer for Layered Polymeric Materials workshop held in Asilomar, CA (February 2017); Organizer for Polymers and Nanotechnology workshop held in San Diego, CA (December 2017).

Professional Development: N/A

Percentage of time committed to the program: 100
Name: John Haglund  
**Academic Rank and Title:** Associate Professor of Instruction

**Degrees:**  
- Ph.D., mechanical engineering, Texas A&M University, 2003  
- M.S., mechanical engineering, Texas A&M University, 2000  
- B.S., mechanical engineering, Montana State University, 1995

**Years of Service on Texas A&M Faculty:** 24 Years  
Associate Professor of Instruction/Lecturer/Research Associate (08/2003-present)

**Other Related Experience:**  
Lecturer/Research Associate, Mechanical Engineering, University of Texas at Austin (08/2005-12/2013)

**State(s) in which registered:** N/A

**Undergraduate and Graduate Courses Taught:**  
- MEEN 344 Fluid Mechanics  
- MEEN 315 Engineering Thermodynamics  
- ENGR 112 Foundations of Engineering II  
- MEEN 260 Mechanical Measurements  
- MEEN 401/402 Introduction to Mechanical Engineering Design I and II  
- MEEN 364 Dynamic Systems and Controls  
- MEEN 363 Dynamics and Vibrations  
- MEEN 404 Engineering Laboratory  
- MEEN 225 Engineering Mechanics

**Recent Graduate Student Advising:** N/A

**Five Recent Publications:**


**Scientific and Professional Society Memberships/Offices:** N/A

**Recent Honors and Awards:**  
- 2017 ASME Best Teacher Award, American Society of Mechanical Engineers-Texas A&M University Chapter  
- 2016 American Society of Mechanical Engineers Best Teacher Award
2013 Faculty Appreciation Award for Mechanical Engineering, The Cockrell School of Engineering and Student Engineering Council, The University of Texas at Austin
2012 Faculty Appreciation Award for Mechanical Engineering, The Cockrell School of Engineering and Student Engineering Council, The University of Texas at Austin

Other Recent Professional Activities:

Consulting: N/A

Patents: N/A

Service: N/A

Professional Development: N/A

Percentage of time committed to the program: 100
Name: Shima Hajimirza  
**Academic Rank and Title:** Assistant Professor

**Degrees:**  
- Ph.D., Mechanical Engineering, The University of Texas at Austin, 2013  
- M.Sc., Bioengineering, California Institute of Technology, 2010  
- M.Sc., Mechanical Engineering Southern Illinois University Edwardsville, 2009  
- B.Sc., Mechanical Engineering, University of Mazadaran, Babol, Iran, 2003

**Years of Service on Texas A&M Faculty:** 4  
- Assistant Professor (2016-present)

**Other Related Experience:**  
- Assistant Professor, Engineering Technology at California State Polytechnic University, (2014-2015)  
- Adjunct Professor, Mechanical Engineering at Tennessee State University (2014)  
- Postdoctoral Researcher, The Institute for Computational Eng. and Sciences UT Austin (2013-2014)

**State(s) in which registered:** N/A

**Undergraduate and Graduate Courses Taught:**  
- MEEN 315 Principle of Thermodynamics  
- MEEN 421 Thermal Fluid Analysis and Design  
- MEEN 630 Intermediate Heat Transfer

**Recent Graduate Student Advising:**  
- **Ph.D. Students Advised:**  
  - Mine Kaya (2016-present), Hussein Sharadga (2019-present)  
- **M.S. Students Advised:**  
  - Hyun Hee Kang (2017-present), Kasturee Chaphekar (2019-present)

**Five Recent Publications:**


**Scientific and Professional Society Memberships/Offices:**  
- American Society of Mechanical Engineers (ASME)  
- Society for Industrial and applied Mathematics (SIAM)

**Recent Honors and Awards:**  
- TEES James J. Cain Graduate Teaching Award, 2018
NSF travel Award, May 2017
Early Career Summer Support Award, Calpoly Pomona, 2015

Other Recent Professional Activities:

Consulting: N/A

Patents:

Service:
Vice Chair, American Society of Mechanical Engineers K-20 Computational Heat Transfer
Member of ASME K-6 committee on Heat Transfer in Energy Systems
Track Chair, Radiation Heat Transfer and Radiation Properties and Inverse Problems in Heat Transfer, ASME International Congress & Exposition, 2019
Track Organizer for Heat Transfer and thermal Engineering: Thermal Management and Electronic Equipment, ASME, IMECE, 2018
Track Chair for Servers of the Future, Internet of things, and Edge to cloud, and Power Electronics, Energy Conversion, and Storage, ASME 2018 International Technical Conference on Packaging and Integration of Electronic and Photonic Microsystems Conference and Exhibition (IntePACK), 2018
Session Chair for Heat and Mass Transfer at High Temperature, American Society of Thermal and Fluid Engineers, 2018
Session Chair for System-Level Thermal Management Itherm 2018-The Intersociety Conference on Thermal and Thermomechanical Phenomena in Electronic Systems, 2018
Session Chair for Applications of Computational Heat Transfer I and II, Computational Heat Transfer Methods, and Computational Heat Transfer Methods for Micro/nanoscale, ASME IMECE, 2017
Session Organizer/Chair for Applications of Computational Heat Transfer, and Optimization and Machine Learning Methods in Heat Transfer of the ASME summer heat transfer conference, 2017
Faculty host for CANIETI summer research program for undergraduate students 2016
Research
Reviewer for ASME IMECE, ASME SHTC, ASTFE, and Itherm conference papers
Proposal reviewer panelist for NSF CBET and CMMI programs
Proposal reviewer for Texas A&M FAPESP program
Adviser for ASME MEEN GIRLS, 2017-present.
Elected Vice Chair/Chair of ASME K-20 Committee in Computational Heat Transfer, 2018-2024

**Professional Development:** N/A

**Percentage of time committed to the program:** 100
Name: Je-Chin Han  **Academic Rank and Title:** Distinguished Professor and Marcus C. Easterling ’30 Chair Professor

**Degrees:**
- Sc.D. Mechanical Engineering, Massachusetts Institute of Technology, 1976
- M.S. Mechanical Engineering, Lehigh University, 1973
- B.S. Mechanical Engineering, National Taiwan University, 1970

**Years of Service on Texas A&M Faculty:** 39
- University Distinguished Professor (2006-present)
- Marcus C. Easterling Endowed Chair Professor (2001-present)
- Professor (1989-2006)
- Associate Professor (1984-1989)

**Other Related Experience:**
- Ex-Cell-O Corporation, Walled Lake, Michigan Senior Research Engineer, Research and Development Center, 1978-1980
- Process Development Engineer, Research and Development Center, 1976-1977
- National Tsing Hua University, Hsinchu, Taiwan Associate Professor of Power Mechanical Engineering, 1977-1978

**State(s) in which registered:**
- Texas, Serial Number 52081, September 13, 1982

**Undergraduate and Graduate Courses Taught:**
- Thermodynamics
- Thermodynamics II
- Heat Transfer
- Thermal Power Systems
- Engineering Laboratory
- Fluid Mechanics
- Heat Transfer Laboratory
- Intermediate Heat Transfer
- Convective Heat Transfer
- Two Phase Flow and Heat Transfer
- Gas Turbine Heat Transfer and Cooling Technology
- Experimental Methods in Heat Transfer and Fluid Mechanics

**Recent Graduate Student Advising:**
- Ph.D. Student Advised:
- M.S. Student Advised:

**Five Recent Publications:**


Scientific and Professional Society Memberships/Offices:

American Society of Mechanical Engineers, Member, 1980-present
American Society of Engineering Education, Member, 1982-present
ASME K-14 Gas Turbine Heat Transfer Committee, Member, 1983-present
ASME International Gas Turbine Institute, Heat Transfer Committee K-14, Member, 1983-present; Chair, 2004-2006
ASME K-3 Heat Transfer Honors and Awards Committee, Member, 2003-2005; Chair 2005-2006; Member, 2018-2022
International Symposium on Rotating Machinery (ISROMAC), Scientific Committee, Member, 1984-present; Conference Chair, 2000
International Symposium on Transport Phenomena, Advisory Committee, Member, 1984-present
American Institute of Aeronautics and Astronautics, Member, 1985-present
North American Taiwanese Professors Association, Member, 1985-present; Chair 2017
NATPA Professor ST Liao’s Memorial Award Committee Chair 2015-present
The Honor Society of Phi Kappa Phi, Member, 1990-present
ASME, Fellow, 1991
AIAA, Associate Fellow, 1994
The Scientific Research Society of Sigma Xi, Member, 1996-present
International Heat Transfer Conference, Conference Paper Review Committee, North American Region Associate Editor (IHTC 15, Kyoto 2014)
American Association for the Advancement of Science (AAAS), Member, 2014-present
ASME, Life Fellow, 2015
AIAA, Fellow, 2016

Recent Honors and Awards:

ASME K-14 Best Heat Transfer Paper Award, 2018
ASME and AICHE Max Jakob Memorial Award, 2016
AIAA FELLOW, 2016
ASME IGTI Aircraft Engine Technology Award, 2016
ASME Heat Transfer Division 75th Anniversary Medal, 2013

Other Recent Professional Activities:

Consulting: N/A
Patents:

Service:
Named Faculty Appointment Committee, Member: 2013-present
Honors and Awards Committee, Chair: 2011-2013
Endowed Chairs and Professorships Review Committee, Member: 2002-2007
Endowed Chairs Council, Member: 2003-2012
College of Eng Distinguished Professor Nomination Committee, Member: 2006-present
College of Engineering Think Tank Committee, Member: 2013-present
College of Engineering Texas Institute of Advanced Study Committee, Member: 2013-present
Taiwan Study Club, Advisor: 2008-present
University Level Distinguished Professor Nomination Committee, Member: 2013-2014

Professional Development: N/A

Percentage of time committed to the program: 100
Name: Zohaib Hasnain  
**Academic Rank and Title:** Research Assistant Professor

**Degrees:**  
Ph.D., Aerospace Engineering, University of Maryland, 2014  
M.S., Aerospace Engineering, University of Maryland, 2012  
B.S., Aerospace Engineering, University of Maryland, 2008

**Years of Service on Texas A&M Faculty:** 1  
Research Assistant Professor (2018-present)

**Other Related Experience:**  
Post-Doctoral Research Associate, University of Maryland (2014-2016)

**State(s) in which registered:** N/A

**Undergraduate and Graduate Courses Taught:**  
University of Maryland:  
ENAE 202 Aerospace Computing (C++ and MATLAB)

**Recent Graduate Student Advising:**  
Briana Holton (PhD)  
Kaustubh Tangsali (MS)  
Madhu Areti (MS)  
Kartik Prakash (MS)  
Shah Akib Sarwar (MEng)

**Five Recent Publications:**  

**Scientific and Professional Society Memberships/Offices:**  
Member of *American Institute of Aeronautics and Astronautics* since 2008

**Recent Honors and Awards:**  
Virgin Galactic/TSC “Pure Grit” award for contributions to SS2 Unity, 2018  
National Engineering and Science Commission Award, 2004-2008  
University of Maryland A. James Clark School of Engineering Dean’s List, 2004-2008  
1st place NASA RASC-AL Lunar Rover design competition, 2008  
Minta Martin Fellowship for Graduate Studies, 2008-2009

**Other Recent Professional Activities:**
Consulting:
The Spaceship Company (2018-2019)

Patents: N/A

Service:
Reviewer, International Journal of Flow Control
Reviewer, Experimental Thermal and Fluid Science
Reviewer, Journal of Propulsion and Power
Reviewer, Mechanism and Machine Theory

Professional Development: N/A

Percentage of time committed to the program: 100
Name: M. Cynthia Hipwell  

**Academic Rank and Title:** TEES Eminent Professor

**Degrees:**
- Ph.D., Mechanical Engineering, University of California, Berkeley
- M.S., Mechanical Engineering, University of California, Berkeley
- B.S. Mechanical Engineering, Rice University, Houston Texas

**Years of Service on Texas A&M Faculty:** 2
- TEES Eminent Professor (2017-present)

**Other Related Experience:**
- Advisory Board Member, Chromatic 3D Materials (2017-2018)
- Executive Director & Sr. Director, Advanced Mechanical Technology Seagate Technology, (2004-2010)
- Director & Senior Director, Mechanical Reliability & Development Systems (2002-2004)
- Director, Head-Disk Mechanical Technology Development, 2001-2002
- Manager & Senior Manager, Advanced Mechanical Integration (1999-2001)
- Sr. Advisory Engineer, Advanced Mechanical Integration (1996-1999)

**State(s) in which registered:**

**Undergraduate and Graduate Courses Taught:**
- MEEN 689 Entrepreneurialship in Nano and Energy
- MEEN 689 Developing an Innovation Mindset
- MEEN 402 Intermediate Design

**Recent Graduate Student Advising:**
- Ph.D.- Xinyi Li, Changhyun Choi
- M.S.- Sitangshu Chatterjee, Akash Anilkumar

**Five Recent Publications:**
2. Y., M., Hipwell, M.C “Modeling Capillary in the Finger-Device Tribology Interfaces” STLE Tribology Frontiers, October 2019
3. Li,X., Lai, C., Chatterjee, S., Ma,Y., Hipwell,M.C. “Study of human fingertip friction with controlled relative humidity” STLE Tribology Frontiers, October 2019
4. Chatterjee, S., Del Toro, M. Li,X., Ma,Y., M., Hipwell, M.C “Design and optimization of a finger-surface tribometer with constant normal load control” STLE Tribology Frontiers, October 2019

**Scientific and Professional Society Memberships/Offices:**
- National Academy of Engineering: Elected Member 2016-, Peer Committee Member (2017), Peer Committee Vice Chair (2018), Peer Committee Chair (2019); Frontiers of Engineering Chair (2021)
MIT Corporation Visiting Committee for the Department of Mechanical Engineering 2020 & 2022
National Academy of Inventors, Fellow 2019
Founder, Grace Hopper Women Innovators Program and Speaker Series – Texas A&M, 2019-present
Governor’s University Research Initiative Recipient 2017-2020
Department of Mechanical Engineering Industry Advisory Board Mentoring Award 2019
Advisor, Mechanical Engineering Graduate Women Student Group 2018-present
Texas A&M NSF i-Site program Mentor 2017- present
The Academies of Medicine, Engineering, and Science of Texas (TAMEST) “Innovating Texas” 2020
Conference Committee and Technology Commercialization Contest Chair
Texas A&M President’s Excellence Fund Committee 2018-present
Faculty Advisory Committee, department, 2018-present
Mentoring Committee Chair, department 2018-present
Institute of Electrical and Electronics Engineers - Member
American Society of Mechanical Engineers- Member
Society of Tribologists and Lubrication Engineers
TAMEST 2020 Conference “Innovating Texas” Organizing Committee

Recent Honors and Awards:
2019 Mechanical Engineering Industry Advisory Council Faculty Mentoring Award
Fellow, National Academy of Inventors
2019 Aggie Women Network Eminent Scholar Award

Other Recent Professional Activities:

Consulting: N/A

Patents:
6,483,668 B2 Hipwell et al. “Edge Contact Protection Feature for a Disc Drive Head” 11/19/2002
6,608,735 B1 Serpe et al. “Assymetric Tapered Air Bearing Slider” 4/19/2003
5,970,038 Boutaghou et al, “Reduction of Mesa Fly Height Modulation Due to Media Asperities in Magneto-Optic Drives” 10/19/1999
6,466,410 B2 Polycarpou et al. “Slider for a Data Storage Device with Head Disc Interface for Contact Starts and Stops” 10/15/2002
Service:
Mentoring Committee Chair 2019
MEEN Grad Women Advisor 2019
President’s Excellence Fund Committee 2019
NSF i-Corps and i-Site Mentor 2019
Dept. Head Advisory Committee 2019
Faculty Search Committees Chair 2018-2019
Faculty Search Committees Member 2017, 2019

Professional Development:
*Leadership Enhanced through Accelerated Development (LEAD) 2012-2013*
Seagate’s High Potential Executive Development Program
*Harvard Business School Executive Education*
Seagate Strategic Leadership Development Program (Mini-MBA) 2006-2007
One of the first 50 of 100 leaders selected for a Seagate-specific Director and VP program.
*Business Process Training*
Design for Six Sigma (DFSS), Six Sigma, Lean, Design for Reliability & Manufacturability, FMEA, Design of Experiments (DOE), 8D, Kepner-Tregoe, Crosslead (McCystal Group)

Percentage of time committed to the program: 100
Name: Harry Hogan

Academic Rank and Title: Professor

Degrees:
- Ph.D., Mechanical Engineering, Texas A&M University, 1984
- M.S., Biomedical Engineering, Louisiana Tech University, 1981
- B.S., Mechanical Engineering and Biomedical Engineering, Louisiana Tech University, 1979

Years of Service on Texas A&M Faculty:
- Associate Dean for Graduate Programs, College of Engineering, 2018 – present
- Professor, 2015 – present
- Professor (joint), Biomedical Engineering, 2015 – present
- Associate Professor, 1992 – 2015
- Associate Professor (joint), Biomedical Engineering, 2009 – 2015
- Undergraduate Coordinator, 2003 – 2013
- Associate Professor, Human Anatomy & Medical Neurology, Texas A&M Health Science Center, 2000 - 2006
- Assistant Professor, 1986 - 1992
- Assistant Professor, Mechanical Engineering, Louisiana Tech University, 1984 - 1986
- Lecturer, Mechanical Engineering, 1981 - 1984

Other Related Experience:
- NASA Summer Faculty Fellow, Johnson Space Center, 1996
- NASA Summer Faculty Fellow, Johnson Space Center, 1995
- Air Force Summer Faculty Research Fellow, Weapons Laboratory, 1989
- NASA Summer Faculty Fellow, Marshall Space Flight Center, 1986
- Staff Engineer, Biomedical Engineering, Louisiana Tech University, 1981

State(s) in which registered:
- Registered Professional Engineer, State of Louisiana, Certificate #22741, 3/87

Undergraduate and Graduate Courses Taught:
- CVEN 305 Mechanics of Materials
- MEEN 381 Seminar
- MEEN 368 Solid Mechanics in Mechanical Design
- MEEN 475 Materials in Design
- MEEN 485 Directed Studies, Mexico Exchange Program
- MEEN 605 Applied Finite Element Modeling
- MEEN 646 Introduction to the Finite Element Method
- MEMA 647 Theory of Finite Element Analysis
- MEEN 444 Finite Element Analysis in Mechanical Engineering
- MEEN 445/446 Mechanical Engineering Design II & III
- MEEN 338 Mechanical Engineering Design I
- MEEN 211, 212, 213 Sophomore engineering mechanics courses in statics and dynamics
- ENGR 109 Engineering Problem Solving and Computing

Recent Graduate Student Advising:
- Ph.D. Students Advising:
  - Jon Paul Elizondo, Expected 2020
  - Scott E. Lenfest, Expected 2020
  - Jessica E. Brezicha, December 2019
  - Ramon D. Boudreaux, May 2014
M.S. Students Advising:

Five Recent Publications:

Scientific and Professional Society Memberships/Offices:
ASME - Applied Mechanics and Bioengineering Divisions
American Society for Bone and Mineral Research

Recent Honors and Awards:
Association of Former Students Distinguished Achievement Award in Teaching, 2018
Mechanical Engineering Industrial Advisory Council Outstanding Faculty Contribution Award, 2015
TAMU Pi Tau Sigma, Outstanding Faculty Award 2014
Charles M. Crawford Service Award, 2010-2011, Look College of Engineering
ASME Fellow, 2008
Mervin and Annette Peters Advising Award, Texas A&M President's Award, May 2007

Other Recent Professional Activities:

Consulting:
Baby Crib Patent Infringement
• Retained by attorneys for plaintiff in patent infringement suit
• Engineering analysis of device function and performance characteristics
Medical Device Patent Infringement
• Retained by attorneys for defendants in patent infringement suit
• Engineering analysis of device function and performance characteristics
• Mechanical testing and analysis of device function
• Expert report preparation, deposition and trial testimony
Baby Crib Failure
• Mechanical failure of drop-side components
• Engineering analysis of failure mechanisms
Spine Catheter Failure
• Intradiscal catheter failed and left broken remnant in patient intervertebral disc
• Engineering analysis of device design and usage
Drilling Rig Derrick Failure
• Finite element modeling conducted of drilling rig derrick failure
• Derrick collapsed catastrophically during operation
• Model had to be "reverse engineered" from measurements (no drawings)
• 3-D beam elements used to model angles, channels, and square tubes (ANSYS)
• Stresses and deflections in members were compared for alternate loading scenarios
Temporomandibular Joint Implant Failure Analysis
• Analytical stress analysis conducted of condylar prosthesis component
• Analysis of failure modes and scenarios in conjunction with materials science expert
Drill String Failure
• Finite element modeling conducted of drill string failure
• Well blowout buckled and ejected string
• Non-linear finite element analysis employed (ANSYS)
• Beam elements with contact and large displacements
Modular Apartment Buildings
• Finite element modeling conducted of modular apartment buildings (ANSYS)
• Used combined beam, bar, and plate elements to model floor, roof, and wall constructions
• Compared different construction methods for various wind and floor loading scenarios
• Assessed damaged units and modeled different repair options

Patents: N/A

Service:
ASME Bioengineering Division Solid Mechanics Committee, 1987-2009
Faculty Advisor, ASME Student Section, Texas A&M University, 1999-2019
Faculty Coordinator, Mexico Exchange Program, 2001-2018

Professional Development: N/A

Percentage of time committed to the program: 100
Name: Sheng-Jen Hsieh  
Academic Rank and Title: Professor

Degrees:  
Ph.D. in Industrial Engineering, Texas Tech University, 1995  
M.S. in Industrial Engineering, St. Mary's University, 1989  
B.S. in Industrial Engineering, National Taipei University of Technology, 1982

Years of Service on Texas A&M Faculty: 21  
Professor (2010-present)  
Associate Professor (2004-2010)  
Assistant Professor (1998-2004)

Other Related Experience:  
AFOSR Faculty Research Associate, Air Force Research Laboratory (2003, 2004)  
Research Associate, Army Aeromedical Research Laboratory (1999-2002)  
AFOSR Faculty Research Associate, San Antonio Air Logistics Center (1998)  
Assistant Professor, The University of Texas-Pan American (1996-1998)  
Instructor, Texas State Technical College (1995-1996)

State(s) in which registered: N/A

Undergraduate and Graduate Courses Taught:  
Manufacturing Simulation  
Quality Assurance/Quality Control  
Concepts of Manufacturing Lab  
Computer-Integrated Manufacturing  
Simulation Modeling and Operations Research  
Introduction to Industrial Engineering  
Manufacturing Planning and Control  
Computer-Aided Design  
Manufacturing Process Lab

Recent Graduate Student Advising:  
Xunfei Zhou, Peng Bo, and Xijin Shi

Five Recent Publications
Scientific and Professional Society Memberships/Offices:
  Society of Manufacturing Engineers (SME) Member (1995 to present)
  American Society for Engineering Education (ASEE) Member (2003 to present)
  International Society for Optical Engineering (SPIE) Senior Member (2005 to present)
  American Association for the Advancement of Science (AAAS) Member (2016 to 2018)

Recent Honors and Awards:
  Honorary International Chair Professor, National Taipei University of Technology, 2015-2021
  William and Montine P. Head Fellow, Texas A&M University Engineering, 2014-15
  Faculty Excellence in Teaching, Research, and Service Award. Department of Engineering Technology
  and Industrial Distribution, Texas A&M, 2014
  Outstanding Reviewer. Emerald Literati Network Award for Excellence, 2012
  Halliburton Foundation Professorship, Texas A&M Engineering, 2010-2011
  Honorary Guest Faculty Member, National Taipei University of Technology, 2009 SPIE Senior
  Member, 2011-present
  National Science Foundation CAREER Award, 2003-2008
  Halliburton Faculty Fellow, Texas A&M University Engineering Program, 2005-2006

Other Recent Professional Activities:
  Consulting: N/A
  Patents:
    Apparatus and system for testing an image produced by a helmet-mounted display. U.S. Patent with
    Clarence E. Rash, Thomas H. Harding, Howard H. Beasley, John S. Martin, Ronnie W. Reynolds and
  Service:
    Assembly Automation, Associate Editor, 2008-2015. Editorial board, 2015-present
    Industrial Robot, Associate Editor, 2008-present
    Computer Applications in Engineering Education, Editorial board member, 2009-2014
    International Journal of Engineering Education, 2019 to present
    SPIE ThermoSense Conference (international scope): Chair, 2014-15 (elected); Co-Chair, 2013- 2014
    (elected); steering committee member, 2005-present
    ASEE Manufacturing, Division Chair, 2015, Program Chair 2014, Member 2003 to present

  Professional Development: N/A
  Percentage of time committed to the program: courtesy appointment
Name: James Hubbard Jr.  
Academic Rank and Title: TEES Eminent Professor

Degrees:  
Ph.D. Mechanical Engineering, Massachusetts Institute of Technology, 1982  
M.S. Mechanical Engineering, Massachusetts Institute of Technology, 1979  
B.S. Mechanical Engineering, Massachusetts Institute of Technology, 1977

Years of Service on Texas A&M Faculty: 2  
TEES Eminent Professor, 2018-Present  
Hagler Institute Fellow, 2017-Present

Other Related Experience:  
Professor, Aerospace Engineering at the University of Maryland, 2004-2018  
Professor, National Institute of Aerospace at the University of Maryland, 2004-2016  
Chief Technology Officer, Co-Founder, iProvica, Inc. 2001-2004  
Chief Technology Officer, Co-Founder, PhotoSense, Inc. 1998-2001  
Senior Systems Engineer, Photonics Center at Boston University, 1995-2004  
Executive Vice President, Optron Systems Inc. 1992-1995  
Vice President for Research, Optron Systems, Inc. 1991-1992  
Chief of Adaptive Sensors Section, Charles Stark Draper Laboratory, 1985-1991  
Lecturer, Department of Mechanical Engineering at Massachusetts Institute of Technology, 1985-1994  
Assistant Professor of Mechanical Engineering, Massachusetts Institute of Technology, 1981-1985  
Instructor, Department of Mechanical Engineering at Massachusetts Institute of Technology, 1977-1978  

State(s) in which registered: N/A

Undergraduate and Graduate Courses Taught:  
MEEN 617 Mechanical Vibration  
MEEN 689 Design and Control of Smart Structures

Recent Graduate Student Advising:  
Ph.D. Students Advised:  

Five Recent Publications:  

Scientific and Professional Society Memberships/Offices:
Member National Academy of Engineering  
Lifetime Member American Institute of Aeronautics and Astronautics  
Fellow American Institute of Aeronautics and Astronautics  
Fellow American Society of Mechanical Engineers  
Member AIAA Smart Structures Technical Committee  
Member The International Society for Optical Engineering  
Member American Society of Engineering Educators  
Senior Member International Society for Optical Engineering  
New England Board of Higher Education Minority Mentors Program  
Sigma Xi Honor Society  
American Helicopter Association  
National Technical Society  
National Society of Black Engineers  
American Institute of Aeronautics and Astronautics  
AIAA Aeroacoustics Sub-committee  
American Society of Mechanical Engineers (Since 12/28/2004)  
ASME Member of Adaptive Structures Technical Committee  
ASME Chair of Adaptive Structures TC Education Committee  

Recent Honors and Awards:  
2019 Induction into The Academy of Medicine, Engineering and Science of Texas  
2018 Member, Texas Academy of Medicine, Science and Engineering  
2018 Fellow, Hagler Institute for Advanced Studies  
2017 Member, Virginia Academy of Science, Engineering and Medicine  
2016 Lifetime Member, National Academy of Engineers  
2016 SPIE Lifetime Achievement Award  
2015 Fellow, American Society of Mechanical Engineers  
2012 Fellow American Institute of Aeronautics and Astronautics (AIAA) Fellow  

Other Recent Professional Activities:  

Consulting: N/A  

Patents: N/A  

Service:  
2016 appointed to Air Force Studies Board  
2011 appointed to AIAA Smart Structures Technical Committee: Chairman of Education Sub-Committee  
2008 appointed to NSF CMSS proposal review panel  

Professional Development: N/A  

Percentage of time committed to the program: 100
Name: Wayne Hung  
Academic Rank and Title: Associate Professor

Degrees:  
Ph.D., University of California - Berkeley, 1987  
M.S., University of Michigan - Ann Arbor, 1979  
B.S., University of Michigan - Ann Arbor, 1978

Years of Service on Texas A&M Faculty: 16  
Associate Professor, Engineering Technology & Industrial Distribution (2003-present)

Other Related Experience:  
Senior Lecturer, San Diego State University (2002-2003)  
Associate Professor, Nanyang Technological University (1991-2001)

State(s) in which registered: N/A

Undergraduate and Graduate Courses Taught:  
MMET 181 Manufacturing and Assembly Processes  
MMET 201 Manufacturing and Materials  
MMET 380 Computer-Aided Manufacturing  
MMET 414 Micro/Nano Manufacturing

Recent Graduate Student Advising:  
Ph.D. Students Advised:  
Shyam Balasubramanian (2021)  
M.S. Students Advised:  

Five Recent Publications

Scientific and Professional Society Memberships/Offices:  
Society of Manufacturing Engineers  
American Society of Engineering Education

Recent Honors and Awards:  
Distinguished Faculty Advisor Award, Society of Manufacturing Engineers, 2019  
Charlotte & Walter Buchanan Faculty Fellow in Engineering Technology, TAMU, 2013
Excellent Teaching award, ETID Department, TAMU, 2012
Recipient for Texas A&M University College of Engineering Faculty Fellow, 2007

Other Recent Professional Activities:
Consulting:
Knust-Godwin LLC
Unist Inc.

Patents: N/A
Service:
Proposal reviewer for National Science Foundation
Editor for J. Engineering Materials and Manufacture, J. Machining Science and Technology
Organize and chair annual Texas Conference on Machining, Gene Haas Foundation, 2010-present
Organize and chair student competitions, Society of Manufacturing Engineers, 2019-present
Organize and chair student competitions, American Society for Engineering Education, 2010-2016

Professional Development: N/A

Percentage of time committed to the program: courtesy appointment
Name: Pilwon Hur  
**Academic Rank and Title:** Assistant Professor

**Degrees:**
- Ph.D., Mechanical Engineering, University of Illinois Urbana-Champaign, 2010
- M.S., Applied Mathematics, University of Illinois Urbana-Champaign, 2010
- M.S., Mechanical Engineering, Korea Advanced Institute of Science and Technology, 2006
- B.S., Mechanical Engineering, Hanyang University, Seoul, Korea, 2004

**Years of Service on Texas A&M Faculty:** 5  
Assistant Professor, 2014-Present

**Other Related Experience:**
- Postdoctoral Research Fellow, University of Wisconsin-Milwaukee, 2010-2014

**State(s) in which registered:** N/A

**Undergraduate and Graduate Courses Taught:**
- MEEN 357 Dynamics Systems and Controls
- MEEN 364 Dynamics Systems and Controls
- MEEN 404 Engineering Laboratory
- MEEN 408/612 Introduction to Robotics/Mechanics of Robotic Manipulators
- MEEN 431 Advanced System Dynamics and Controls
- MEEN 651 Control System Design
- MEEN 652 Multivariable Control System Design
- MEEN 655 Design of Nonlinear Control Systems

**Recent Graduate Student Advising:**
- Ph.D. Students Advised:  
- M.S. Students Advised:  

**Five Recent Publications:**
5. Woolim Hong, Victor Paredes, Kenneth Chao, Shawanee Patrick, Pilwon Hur, "Consolidated control framework to control a powered transfemoral prosthesis over inclined terrain conditions," IEEE/RSJ International Conference on Robotics and Automation (ICRA), May 20-24, Montreal, Canada, pp2838-2844, 2019

**Scientific and Professional Society Memberships/Offices:**
- Institute of Electrical and Electronics Engineers (IEEE)
- American Control Conference (ACC)
- Wearable Robotics Association
- International Society for Virtual Rehabilitation
- American Heart Association (AHA)
- Society for Neuroscience (SfN)
- World Federation for NeuroRehabilitation
- World Congress on Biomechanics (WCB)
- Korean-American Scientist and Engineers Association (KSEA)
- American Society of Biomechanics (ASB)
- Korean Society of Simulation
- Korean Society of CAD/CAM

**Recent Honors and Awards:**
- Horses and Humans Research Foundation Research Award for 2017
- Travel Award, International Conference on Virtual Rehabilitation, 2013
- American Heart Association Postdoc Fellowship, 2012
- Travel Award, World Congress on Biomechanics, 2010
- Paul D. Doolen Scholarship on Aging, Nominated as alternate winner, 2009, 2010

**Other Recent Professional Activities:**

**Consulting:** N/A

**Patents:**
- Daniel McGowan, and Pilwon Hur, “Light Weight, Modular, Powered Transfemoral Prosthesis.”
  International Patent (PCT), 13260-P152WO, filed Dec 12, 2018

**Service:**
- Qualifier Committee for Control: SP2016, FA2016, SP2017
- Distance Learning Committee: FA2016, SP2017, FA2017, SP2018, FA2018
- First Generation Engineering (FGEn) Student Mentor, 2017 - Present
- Engineering & Medicine (EnMed) Thematic Research Subcommittee and Instructor, 2016 - Present
- Explorations Article Reviewer for 2016, 2018
- PESCA Reviewer for 2017, 2018
Advisor, Texas A&M Robotics Team and Leadership Experience 2015-Present
Advisor, Korean-American Scientists and Engineers Association, 2017 - Present
Associate Editor for IEEE International Workshop on Advanced Robotics and its Social Impacts (ARSO), 2017 - Present
Associate Editor, IEEE International Conference on Ubiquitous Robotics, 2018 - Present
Associate Editor, International Journal of Control, Automation, and Systems (IJCAS), 2018 - Present
American Society for Testing and Materials, Committee for standards on Exoskeletons and Exosuits for Industry, Medical and Military Services, 2019 - Present
NSF Review Panelist
NIST BIRD Reviewer

Professional Development: N/A

Percentage of time committed to the program: 100
Name: Timothy Jacobs  
**Academic Rank and Title:** Professor

**Degrees:**  
- Ph.D. University of Michigan, Ann Arbor, (ME), 2005  
- M.S. University of Michigan, Ann Arbor, (ME), 2002  
- B.S. University of Michigan, Ann Arbor, (ME- Summa Cum Laude), 1999

**Years of Service on Texas A&M Faculty:** 13  
Professor, 2017-Present  
Director, Interdisciplinary Engineering for Undergraduate and Graduate Programs, 2017-Present  
Steve Brauer, Jr. ’02 Faculty Fellow, 2015-Present  
Research Associate, Transportation Institute, 2010-Present  
Eppright University Professorship for Undergraduate Teaching Excellence, 2015-2018  
Associate Professor, 2012-2017  
Undergraduate Program Director, 2014-2016  
Undergraduate Program Coordinator, 2013-2014  
Assistant Professor, 2006-2012

**Other Related Experience:**  
Research Fellow, University of Michigan, 2005-2006  
Instructor, University of Michigan, 2002, 2005

**State(s) in which registered:** N/A

**Undergraduate and Graduate Courses Taught:**  
- MEEN 227 Principles of Thermodynamics  
- MEEN 615 Advanced Engineering Thermodynamics  
- MEEN 315 Principles of Thermodynamics  
- MEEN 410 Internal Combustion Engines  
- MEEN 404 Experimental Laboratory – Studio  
- MEEN 421 Thermal-Fluids Analysis and Design  
- MEEN 401 Senior Design Studio  
- MEEN 381 Undergraduate Seminar  
- MEEN 611/689 Advanced Internal Combustion Engines

**Recent Graduate Student Advising:**  
- Ph.D. Students Advised:  
- M.S. Students Advised:  
  - Taylor Linker, 2019,  

**Five Recent Publications:**  

Scientific and Professional Society Memberships/Offices:
American Society of Engineering Education (since 2012)
Pi Tau Sigma (faculty inductee, since 2008)
Combustion Institute (since 2006)
Society of Automotive Engineers (since 1999)
Tau Beta Pi (since 1997)
ASME - Internal Combustion Engines division (since 1996)

Recent Honors and Awards:
Fellow of the American Society of Mechanical Engineers (2018)
Texas A&M Aggies Celebrate Teaching Award (2018)
ASME Special Recognition Service Award for Services to the Internal Combustion Engine Division (2015 and 2016)
Eppright University Professorship of Undergraduate Teaching Excellence (2015)
Steve Brauer, Jr. ’02 Faculty Fellow (2015)
Society of Automotive Engineers’ Lloyd L. Withrow Distinguished Speaker Award (2013)
Society of Automotive Engineers’ Excellence in Oral Presentation Award (2003, 2005, and 2012)
Association of Former Students University-Level Distinguished Achievement Award in Teaching (2012)
SAE Ralph R. Teetor Educational Award (2011)
Pi Tau Sigma’s John Weese Award for Excellence in Teaching (2009, 2010)
Texas Engineering Experiment Station Select Young Faculty Award (2010)
Association of Former Students College-Level Distinguished Achievement Award in Teaching (2010)
Montague-Center for Teaching Excellence Scholar for the College of Engineering (2009)

Other Recent Professional Activities:

Consulting:
Squire Patton Boggs (2017 - continuing)
Howard and Howard (2017)
Shell Global Solutions, Inc. (2014)
PTT: Petroleum Authority of Thailand (2012)
Enerpulse, Inc. (2011)

Patents: N/A

Service:
Central States Section of The Combustion Institute Advisory Board (2010 – present)
Chair of Outreach Activities (2010 – present). Chair-Elect (2017 – present)
ASME Energy Conversion and Storage Segment, Segment Leadership Team, (2015 – present)
Director, Interdisciplinary Engineering for Undergraduate and Graduate Programs (2017 – present)
Pi Tau Sigma Faculty Advisor (2014 – present)
Texas A&M WC Advisory Committee, college representative (2014 – present)
Texas A&M Department of Mechanical Engineering Educational Development, Committee, elected (2010 – present, Chair 2013 - 2016)
Texas A&M Department of Mechanical Engineering Thermodynamics Qualifying Exam Committee (2008 – present)
Texas A&M Department of Mechanical Engineering AY18 Faculty Search Committee chair and Energy and Combustion Sub-Committee chair (2017 – present).
Texas A&M Department of Mechanical Engineering Thermodynamics Course, Coordinator (2011 – 2016)
Texas A&M Department of Mechanical Engineering Undergraduate Program Director, appointed (2013 – 2016)
Texas A&M Department of Mechanical Engineering 25x25 Implementation Committee, appointed (2014 – 2016)
Texas A&M Faculty and Staff Advisory Committee to the Vice President of Student Affairs, college representative, appointed (2014 – 2016)
Texas A&M Pedagogy Project: Supporting Transformational Learning, panelist (2016)
Texas A&M Engineering Programs and Academic Services E12 and WEE Summer Camps for underrepresented and female students, Energy Faculty Advisor (2011 – 2014)
Society of Automotive Engineers Texas A&M University Student Chapter, Faculty Advisor (2007 - 2014)
Texas A&M Department of Mechanical Engineering 25x25 Growth Committee, Chair, appointed (2013 – 2014)

Professional Development: N/A

Percentage of time committed to the program: 100
Name: Dorrin Jarrahbashi Academic Rank and Title: Assistant Professor

Degrees: Ph.D., Mechanical & Aerospace Engineering, University of California, 2014
M.S., Aerospace Engineering, Sharif University of Technology, Tehran, 2007
B.S., Mechanical Engineering, Iran University of Science & Technology, 2005

Years of Service on Texas A&M Faculty: 2
Assistant Professor (09/2017-present)

Other Related Experience:
Post-doctoral Fellow, Woodruff School of Mechanical Engineering, Georgia Institute of Technology, 2015-2017
Assistant Specialist & Lecturer, Department of Mechanical & Aerospace Engineering, University of California Irvine, 2014

State(s) in which registered: N/A
Undergraduate and Graduate Courses Taught:
MEEN 621 Fluid Mechanics
MEEN 344 Fluid Mechanics

Recent Graduate Student Advising:
Ph.D. Students
M.S. Student
Anurag Hari (2018-2020)

Five Recent Publications:

Scientific and Professional Society Memberships/Offices:
Proposal Reviewer for NSF-CBET-Fluid Dynamics Panel, NSF-CBET-Computational and Data-Enabled Science and Engineering.
Session Chair- Combustion Theory & Modeling session, 29th 2018 Spring Technical Meeting Central States Section of the Combustion Institute, Minnesota
Reviewer - President’s Undergraduate Research Awards Georgia Tech, 2015 - 2016.
Institute for Liquid Atomization and Spray Systems, North and South America, Member
Society of Women Engineers, Member.
American Physical Society, Member.

Recent Honors and Awards:
APS Gallery of Fluid Motion in Poster Competition, Division of Fluid Dynamics, 2016
Travel grant - Next Professor Workshop at University of Michigan, Ann Arbor, 2016
Outstanding Poster Award, International Symposium of Supercritical CO2 Power Cycles, 2016
Phi Beta Kappa International Scholarship, 2013
Teaching Assistant Award of Excellence, University of California, Irvine, 2013
Society of Women Engineers Fellowship, 2012

Other Recent Professional Activities:

Consulting: N/A

Patents: N/A

Service: Seminar Committee, Society of Women Engineers.

Professional Development: N/A

Percentage of time committed to the program: 100
Name: Walter Jones  Academic Rank and Title: Professor of Practice

Degrees:  Ph.D. Engineering Mechanics, Clemson University, Clemson, SC, 1982
          M.S. Engineering Mechanics, Clemson University, Clemson, SC, 1981
          B.S. Mechanical Engineering, Clemson University, Clemson, SC 1978

Years of Service on Texas A&M Faculty: 2 months
          Professor of Practice, 2019-present

Other Related Experience:
          Executive Director, Navy International Programs Office, Washington Navy Yard, 2018-2019
          Executive Director, Office of Naval Research, Washington Navy Yard, 2007-2018
          Director, Plans and Programs, Air Force Research Laboratory, Wright-Patterson AFB, 2005-2007
          Director, Aerospace and Materials Sciences, Air Force Office of Scientific Research, 2002-2005
          Senior Program Analyst, Office of the Deputy Director of Central Intelligence for Community Management, ODCCI/CM, Program Assessment and Evaluation Office, George Bush Center for Intelligence, 2001-2002
          Chief Technologist, National Security Space Architect, OASD, 1999-2001
          Student, Industrial College of Armed Forces, National Defense University 1998-1999
          Development Staff Member and Program Manager, Composite and Space Structures Technology Group, Structural Mechanics Section, Engineering Technology Division, Oak Ridge National Laboratory, 1988-1991
          Associate Professor, The University of Florida, 1986-1988
          Assistant Professor, The University of Tennessee, 1983-1986
          Visiting Assistant Professor, Clemson University, 1982-1983

State(s) in which registered:
          Licensed Professional Engineer, Tennessee, Certificate Number 017641, 1984-present

Undergraduate and Graduate Courses Taught:
          The University of Florida:
          Composite Materials
          Finite Element Methods
          Mechanics of Materials
          Engineering Mechanics
          The University of Tennessee:
          Mechanics of Composite Materials
          Energy Methods
          Elasticity
          Dynamics
          Mechanics of Materials
          Vibrations
          Engineering Mechanics

Recent Graduate Student Advising: N/A
Five Recent Publications:

Scientific and Professional Society Memberships/Offices:
American Institute of Aeronautics and Astronautics (Associate Fellow)
American Society of Mechanical Engineers (Fellow)
Society for Experimental Mechanics (former Executive Board Member)

Recent Honors and Awards: N/A

Other Recent Professional Activities:
Consulting: N/A
Patents: N/A
Service: N/A

Professional Development: N/A

Percentage of time committed to the program: 50

Name: Ibrahim Karaman  
Academic Rank and Title: Department Head and Professor

Degrees:  
Ph.D. Mechanical Engineering, University of Illinois, Urbana-Champaign, 2000  
M.S. Mechanical Engineering, Bogazici University, 1996  
B.S. Mechanical Engineering, Bogazici University, 1995

Years of Service on Texas A&M Faculty: 13  
Professor (2011-present)  
The Dietz Career Development Associate Professor I (2007-2010)  
Associate Professor (2006-2011)

Other Related Experience: 
State(s) in which registered:

Undergraduate and Graduate Courses Taught:

Recent Graduate Student Advising:

Five Recent Publications


Scientific and Professional Society Memberships/Offices:

Recent Honors and Awards:

- The Minerals, Metals, and Materials Society (TMS) Robert Lansing Hardy Award, 2005
- Texas A&M, Texas Engineering Experiment Station Select Young Faculty Award, 2002
- Texas A&M, Texas Engineering Experiment Station Special Research Fellow, 2001
- National Science Foundation CAREER Award Recipient, 2001

Other Recent Professional Activities:

Consulting:

Patents:


Service:

Professional Development:

Percentage of time committed to the program: Courtesy appointment
Name: Haejune Kim  Academic Rank and Title: Assistant Professor of Instruction

Degrees: Ph.D. Mechanical Engineering, University of Wisconsin-Milwaukee, 2014
         M.S. Mechanical Engineering, Texas A&M University, 2007
         B.S. Mechanical Engineering, Korea University, 2004

Years of Service on Texas A&M Faculty: 16
         Assistant Professor of Instruction, 2017-present
         Research Assistant Professor, 2014-2017
         Technical Lab Manager, 2014
         Instructor, 2014

Other Related Experience:
         Mechanical Engineering Intern, A.O. Smith Corporation Technology Center, 2013

State(s) in which registered: N/A

Undergraduate and Graduate Courses Taught:
         MEEN 464 Heat Transfer Laboratory

Recent Graduate Student Advising: N/A

Five Recent Publications:
1. Y. G. Nam, M. Hummod, H. Kim, A.A Polycarpou, Electrode architecture of carbon-coated silicon nanowires through magnesiothermic reduction for lithium-ion batteries. MRS Communications, 7(4), 867-872, 2017

Scientific and Professional Society Memberships/Offices: N/A

Recent Honors and Awards:
         Chancellor’s Award at University of Wisconsin, Milwaukee (2009)
         Texas A&M University Engineering Scholarship (2005)
         Dean’s Honor List at Korea University (2003)

Other Recent Professional Activities:

         Consulting: N/A
Patents: N/A

Service:
Treasurer of International Christian Fellowship at Texas A&M University
Volunteer Teacher at Vision Korean School in College station, TX
Volunteer Teacher at Saenal Night School in Seoul

Professional Development: N/A

Percentage of time committed to the program: 100
Name: Won-Jong Kim  
**Academic Rank and Title:** Associate Professor

**Degrees:**
- Ph.D. Massachusetts Institute of Technology, 1997
- M.S. Seoul National University, 1991
- B.S. Seoul National University, Summa Cum Laude, 1989

**Years of Service on Texas A&M Faculty:** 19
- Associate Professor, 2006-present
- Associate Professor & Holder of the Gulf Oil/Thomas A. Dietz Career Development Professorship II, 2007-2010
- Assistant Professor, 2000-2006

**Other Related Experience:**
- Staff Engineer, SatCon Technology Corporation, Cambridge, Massachusetts, 1997-2000

**State(s) in which registered:** N/A

**Undergraduate and Graduate Courses Taught:**
- ENGR 111 Foundations in Engineering
- MEEN 335 Mechanical Systems II
- MEEN 363 Dynamics and Vibrations
- MEEN 364 Dynamic Systems and Controls
- MEEN 368 Solid Mechanics in Mechanical Design
- MEEN 431 Advanced System Dynamics and Controls
- MEEN 433/667 Mechatronics
- MEEN 434/634 Dynamics and Modeling of Mechatronic Systems

**Recent Graduate Student Advising:**
- Ph.D. Students Advised
- M.S. Students Advised

**Five Recent Publications:**

Scientific and Professional Society Memberships/Offices:
The American Society of Mechanical Engineers (ASME), Fellow
The Institute of Electrical and Electronics Engineers (IEEE), Senior Member
Pi Tau Sigma, Honorary Faculty Member

Recent Honors and Awards:
IJCAS Academic Activity Award in, “recognition of outstanding services and dedicated work as an Editorial Board Member to the International Journal of Control, Automation and Systems,” 2013
2013 Outstanding Graduate Teaching Award for the Department of Mechanical engineering
Best Student Paper Award Finalist in the IEEE/ASME International Conference on Advanced Intelligent Mechatronics (AIM’ 2010), 2010
Elected Fellow of the American Society of Mechanical Engineers (ASME), 2010
Best Presentation Award from American Control Conference, 2009, 2007, and 2003
Appointed to be the inaugural Holder of the Gulf Oil/Thomas A. Dietz Career Development Professorship II, 2007

Other Recent Professional Activities:

Consulting: N/A

Patents:
Kim, W.-J., “Method and Apparatus for Magnetically Generating Motion with High Precision,” US PTO Patent No. 6,885,536 B1, April 26, 2005

Service:
Organizing Committee, Member, The 2nd World Congress on Petrochemistry, Oil & Gas, 2019
Technical Program Committee, Member, The 15th International Conference on Autonomic and Autonomous Systems 2019
Member, Electoral College, ASME Dynamic Systems and Control Division, 2014–current.
International Program Committee, Member, The 18th International Conference on Control, Automation and Systems 2018
Technical Program Committee, Member, ICAS 2018
Program Committee, Member, The 12th Korea Information Processing Society International Conference on Ubiquitous Information Technologies and Applications 2017
International Program Committee, Associate Editor, Asian Control Conference 2017
International Program Committee, Member, ICCAS 2017
Program Committee, Member, IEEE/ASME International Conference on Advanced Intelligent Mechatronics 2017
Program Committee, Member, ICAS 2017
ETID Faculty Search Committee, External Member, 2018–current
MEEN Educational Development Committee, Member, 2017–current
MEEN ABET Committee, 2014–current
MEEN Faculty Search Committee, Member, 2016–2017
Member of PhD advisory committees
Member of MS advisory committees

**Professional Development:** N/A

**Percentage of time committed to the program:** 100
Name: Yong-Joe Kim  
Academic Rank and Title: Associate Professor

Degrees:  
Ph.D., Mechanical Engineering, Purdue University, 2003  
M.S., Mechanical Engineering, Korea Advanced Institute of Science and Technology, 1997  
B.S., Mechanical Design and Production Engineering, Chung-Ang University, 1994

Years of Service on Texas A&M Faculty: 10  
Associate Professor, Texas A&M University, 09/2015-present  
Assistant Professor, Texas A&M University, 09/2009-08/2015

Other Related Experience:  
Visiting Assistant Professor, Purdue University, 2004

State(s) in which registered: N/A

Undergraduate and Graduate Courses Taught:  
Texas A&M University  
MEEN 617 Mechanical Vibration  
MEEN 613 Engineering Dynamics  
MEEN 459/659 Sound and Vibration Measurements  
MEEN 404 Engineering Laboratory Lecture and Lab Session  
MEEN 363 Dynamics and Vibrations  
MEEN 221 Statics and Particle Dynamics  
Purdue University  
ME 263L Introduction to Mechanical Design Lab Session  
ME 270 Basic Mechanics

Recent Graduate Student Advising:  
Ph.D. Students Advising:  
M.S. Students Advising:  

Five Recent Publications:  

Scientific and Professional Society Memberships/Offices: N/A

Recent Honors and Awards:
- Pioneer Natural Resources Faculty Fellow II, 2014 – 2017
- Graduate Teaching Award: Department of Mechanical Engineering, Texas A&M, 2014

Other Recent Professional Activities:

Consulting:

Patents: N/A

Service:
- Institute of Noise Control Engineering of the USA (INCE-USA), Board Director, Elected, National, 2018
- Inter-Noise 2018, Session Chair, Appointed, International, 2018
- Noise-Con 2019, Technical Chair, Appointed, 2017 – 2019
- Noise Control Engineering Journal, Associate Editor, Appointed, 2017 – Present
- Institute of Noise Control Engineering of the USA (INCE-USA), Vice President for Student Activities and Education, Elected, 2015 – 2018
- Noise-Con 2017, Technical Co-Chair, Appointed, 2017
- Noise-Con 2016, Organizer for Student Activities, Appointed, 2016
- Inter-Noise 2015, Session Organizer (“Student Presentation Competition”), 2015
- Shared Services Committee, Appointed, 2016 – 2017
- Honors and Awards Committee, Appointed, 2015 – 2017
- Faculty Search Committee, Appointed, 2015 – 2016

Professional Development: N/A

Percentage of time committed to the program: 100
Name: Mark Kimber

Academic Rank and Title: Assistant Professor

Degrees:
Ph.D. in Mechanical Engineering, Purdue University, 2008
M.S. in Mechanical Engineering, Brigham Young University, 2004
B.S. in Mechanical Engineering, Brigham Young University, 2002

Years of Service on Texas A&M Faculty: 4
Assistant Professor, Nuclear Engineering, Texas A&M (2015-present)

Other Related Experience:
Assistant Professor, Mechanical Engineering and Materials Science, University of Pittsburgh (2008-2015)

State(s) in which registered: N/A

Undergraduate and Graduate Courses Taught:
- NUEN 489 Thermodynamics in Nuclear Systems
- NUEN 624 Nuclear Thermal Hydraulics and Stress Analysis
- NUEN 489/689 CFD in Nuclear Systems
- NUEN 302 Introduction to Nuclear II

Recent Graduate Student Advising:
Ph.D. Students Advised:
M.S. Students Advised:
Edward Kraft, 2018, Andrew Marvel, 2018, Juan Reyes, 2018

Five Recent Publications


Scientific and Professional Society Memberships/Offices:
American Society of Mechanical Engineers (ASME) Member
American Physics Society (APS) Member
American Nuclear Society (ANS) Member
Review Panel: Thermal Materials, SBIR/STTR, National Science Foundation

Recent Honors and Awards:
Nuclear Regulatory Commission Faculty Development Award (2009-2011)
Other Recent Professional Activities:

Consulting: N/A

Patents:
Variable Smart Insulation, United States Patent Application 20130081786

Service:
2017-present Scholarship committee member
2017-present Faculty advisor for TAMU student chapter of American Nuclear Society
2016-present Power Engineering Subcommittee, Ph.D. Qualifying Exam
2016-present Member of Graduate Committee
2016-present Senior Capstone Team Advisor
2016-present Chair of Transport Phenomenon Sub-committee for Undergraduate Shared Laboratory Committee
2017-present Junior Faculty Advisory Council, Departmental representative

Professional Development: N/A

Percentage of time committed to the program: Courtesy appointment
Name: Vinayak Krishnamurthy  Academic Rank and Title:  Assistant Professor

Degrees:  
Ph.D. in Mechanical Engineering, Purdue University, 2015  
M.Sc. in Engineering, Indian Institute of Science, 2010  
B.E. in Mechanical Engineering, Punjab Engineering College, 2006

Years of Service on Texas A&M Faculty: 3  
Assistant Professor (2016-Present)

Other Related Experience:  
Postdoctoral Research Associate, Purdue University (2016)

State(s) in which registered: N/A

Undergraduate and Graduate Courses Taught:  
MEEN 210 Geometric Modeling for Mechanical Design  
MEEN 601 Advanced Product Design  
MEEN 602 Modeling and Analysis of Mechanical Systems

Recent Graduate Student Advising:  
Ph.D. Students Advised:  
Ronak Mohanty (2016-Present), Ting-Ju Chen (2016-Present)  
M.S. Students Advised:  

Five Recent Publications:  


Scientific and Professional Society Memberships/Offices:  
Association for Computing Machinery (ACM)
American Society of Mechanical Engineers (ASME)

Recent Honors and Awards:
   ACM SIGGRAPH Best Student Research Competition – 2019
   Peggy L. and Charles L. Brittan Teaching Award for Outstanding Undergraduate Teaching – 2018
   All-Conference Best Paper Award — ASME IDETC/CIE 2012

Other Recent Professional Activities:

Consulting: N/A

Patents:
Cecil Kumar Piya, Vinayak, and Karthik Ramani, Sketch-based 3D Modeling System, USPTO Application US20180158239A1
Cecil Kumar Piya, Vinayak, and Karthik Ramani, Collaborative 3D Modeling System, USPTO Application US20180122138A1

Service:
Panelist & Proposal Reviewer – The National Science Foundation
Member (by Appointment) – Seminar Committee, Department of Mechanical Engineering, Texas A&M

Professional Development: N/A

Percentage of time committed to the program: 100
Name: Waruna Kulatilaka  Academic Rank and Title: Associate Professor

Degrees:  Ph.D., Mechanical Engineering, Purdue University, 2006  
          M.S., Mechanical Engineering, Texas A&M University, 2002  
          B.Sc. (Hons), Mechanical Engineering, University of Moratuwa, 2000

Years of Service on Texas A&M Faculty: 5  
Associate Professor (2014-current)

Other Related Experience:  
Senior Research Scientist, Air Force Research Laboratory, 2009 – 2014  
Postdoctoral Researcher, Sandia National Laboratories, 2007 – 2009

State(s) in which registered: N/A

Undergraduate and Graduate Courses Taught:  
MEEN 404 Engineering Laboratory  
MEEN 680 Optical Techniques for Engineering  
MEEN 315 Principles of Thermodynamics

Recent Graduate Student Advising:  
Ph.D. Students Advised:  
M.S. Students Advised:  

Five Recent Publications:

Scientific and Professional Society Memberships/Offices:  
American Society of Mechanical Engineering - Fellow  
American Institute of Aeronautics and Astronautics - Associate Fellow  
The Optical Society – Senior Member
Combustion Institute - Member 2003, Board Member, Central States Section
Society for Applied Spectroscopy
American Physical Society
American Society of Engineering Education

**Recent Honors and Awards:**
- Fellow – American Society of Mechanical Engineers (2014)
- Associate Fellow – American Institute of Aeronautics and Astronautics (2012)
- Outstanding Technical Contribution Award - Dayton Section of ASME (2012)

**Other Recent Professional Activities:**

**Consulting:** N/A

**Patents:**

**Service:**
- Faculty Advisor - ASME-Eng Students Section, 2017–Present
- Member - Graduate Studies and Research Committee, 2018/2019, 2017/2018
- Member - Faculty Search Committee, Combustion & Energy Sub-Committee, 2017/2018
- Member - Faculty Search Committee – Aerospace Engineering, 2016/2017, 2017/2018
- Member - Faculty Search Committee – Mechanical Engineering, 2016/2017
- Chair - PhD Qualifying Exam Committee, Thermodynamics, 2016/2017
- Member - Honors and Awards Committee, 2015/2016, 2016/2017
- Member - Seminar Committee, 2015/2016
- Member - PhD Qualifying Exam Committee, Thermodynamics, 2015/2016
- Voting Member - TAMU Radiological Safety Committee, 2019–Present
- Judge - Student Research Week, Graduate and Professional Student Council, 2015
- Panelist - Grad Camp Faculty Connect, Graduate and Professional Student Council, 2015
- Reviewer - Aggies Commit Fellowship Awards, 2015
- Program Chair - 9th US National Meeting of the Combustion Institute, 2015
- Program Chair - Spring Technical Meeting, Central States Section of the Combustion Institute, 2014
- Board Member - Central States Section of the Combustion Institute, 2012–Present
- Assistant Local Host - Central States Section Spring Technical Meeting, 2012
- Session Chair - Spring Technical Meeting of the Central States Section of the Combustion Institute, 2018
- Session Co-Chair, ASME International Mechanical Engineering Congress & Exposition, 2015
- Chair - 9th Annual Dayton Engineering Sciences Symposium, 2013
- Board Member (Elected) - Dayton Section of ASME, 2012–2014
- Co-chair & Session Chair Coordinator - 8th Annual Dayton Engineering Sciences Symposium 2012
Session Chair Coordinator - 7th Annual Dayton Engineering Sciences Symposium, 2011
Program Chair - 6th Annual Dayton Engineering Sciences Symposium, 2010
Session Chair - Dayton Engineering Sciences Symposium, 2009, 2010
Topical Editor (Member of the Editorial Board) - *Applied Optics*, 2017–Present
Program Committee Member - Active Optical Sensing Subcommittee, Conference on Lasers and Electro Optics, 2017, 2018, 2019
General Chair - OSA Topical Meeting, Laser Applications to Chemical, Security, and Environmental Analysis, 2016
Program Committee Member - OSA Topical Meeting Optics and Photonics for Energy & the Environment, 2015, 2016
Co-Chair - OSA Topical Meeting, LACSEA, 2014
Program Committee Member - OSA Topical Meeting, LACSEA, 2012–2018
Program Committee Member - OSA Topical Meeting, 2012
Member - Aerodynamic Measurements Technologies Technical Committee of AIAA, 2016–Present
Session Co-Chair, AIAA AVIATION Conference, 2016
Session Co-Chair, AIAA Propulsion and Energy Conference, 2015
Member - Propellants and Combustion Technical Committee of AIAA, 2013–Present

**Professional Development:**

Engineering Online Technology Clinic – Engineering Studio for Advanced Instruction & Learning, 2018
Faculty Teaching Academy - Fostering Teaching Excellence Through Mentoring workshop, 2016
WE/ADVANCE Faculty Focus: Writing and Reviewing Recommendation Letters Workshop, 2016
TAMU Center for Teaching Excellence workshop ‘Course Syllabus,’ 2014

**Percentage of time committed to the program:** 100
Name: Thomas Lacy  
Academic Rank and Title: Professor

Degrees:
- Ph.D., Mechanical Engineering, Georgia Institute of Technology, 1998
- M.S., Mechanical Engineering, Georgia Institute of Technology, 1992
- B.S., Mechanical Engineering, University of New Mexico, 1983

Years of Service on Texas A&M Faculty: 1
- Professor (2018-Present)

Other Related Experience:
- Chief Technology Officer for the Marvin B. Dow Advanced Composites Institute, Mississippi State University (2018)
- Professor, Aerospace Engineering at Mississippi State University (2004-2018)
- Interim Department Head of Aerospace Engineering, Mississippi State (2013-2016)
- Assistant Professor, Aerospace Engineering at Wichita State University (1998-2003)
- Instructor and Stress Analyst, Georgia Institute of Technology (1991-1997)
- Senior Design Engineer (Contractor), McDonnell Douglas Corporation (1988-1991)

State(s) in which registered: N/A

Undergraduate and Graduate Courses Taught:
- Engineering Mechanics I (Statics)
- Mechanics of Materials
- Mechanics of Deformable Structures
- Flight Structures I
- Flight Structures II
- Mechanical Behavior of Materials
- Advanced Mechanics of Materials
- Mechanics of Composite Materials
- Introduction to the Finite Element Method
- Mechanics of Continuous Media
- Advanced Mechanics of Damage Tolerance

Recent Graduate Student Advising:
- Ph.D. Students Advised:
- M.S. Students Advised:
  - H. Bowering (Present), A. Mote (Present)

Five Recent Publications:

Scientific and Professional Society Memberships/Offices:
- Fellow, American Society of Mechanical Engineers, 2011-present
- Associate Fellow, American Institute of Aeronautics and Astronautics, 2006-present
- Member, American Society of Mechanical Engineers 1983-present
- Member, American Society for Composites, 2004-2016
- Member, Society of Automotive Engineers, 2009-2016
- Member, Sigma Gamma Tau National Aerospace Engineering Honor Society, 2005-present
- Member, American Society for Engineering Education, 2014-present

Recent Honors and Awards:
- American Society of Mechanical Engineers Fellow
- Chief Technology Officer, MSU Marvin B. Dow Advanced Composites Institute, 2018
- Founder, Innovative Materials LLC, 2018
- Founding university partner/collaborator, NASA Glenn Multiscale Analysis Center of Excellence
- Recipient, 2017 MSU Bagley College of Engineering Faculty Research Award
- American Institute of Aeronautics and Astronautics Associate Fellow
- Sigma Gamma Tau National Aerospace Engineering Honor Society Member

Other Recent Professional Activities:

Consulting: N/A

Patents: N/A

Service:
- Vice President, American Society for Composites (ASC), 2014-2015
- Recording Secretary, ASC, 2012
- Chair, Emerging Technologies Division, American Society for Composites, 2009-2012
- Chair, MSU Aerospace Engineering Department Tenure & Promotion Committee, 2010-2013, 2016-2018

Professional Development:
- American Council on Education Leadership Academy for Department Chairs, 2014
- MSU Research and Economic Development Faculty Leadership Program 2012-2013
- Short Course: “Ethics and Ethical Decision-Making,” Mississippi State, 2012
Percentage of time committed to the program: 100
Name: Shoufeng Lan  
Academic Rank and Title: Assistant Professor

Degrees:  
Ph.D., Electrical and Computer Engineering, Georgia Institute of Technology, 2017  
M.E., Optical Science and Engineering, University of New Mexico, 2011  
M.S., Precision Instrument & Optoelectronics Engineering, Tianjin University, 2009  
B.S., Optoelectronic Technology and Science, Nankai University/Tianjin University, 2007

Years of Service on Texas A&M Faculty: 3 months  
Assistant Professor (09/2019-present)

Other Related Experience:  
Postdoctoral Scholar, University of California, Berkeley (06/2017-08/2019)

State(s) in which registered: California

Undergraduate and Graduate Courses Taught: N/A

Recent Graduate Student Advising: N/A

Five Recent Publications:
5. X. Wang, S. Lan, “Optical properties of black phosphorus,” Advances in Optics and Photonics, 8, 618-655, 2016.

Scientific and Professional Society Memberships/Offices:  
Member: APS, IEEE, SPIE, MRS, OSA, Sigma Xi

Recent Honors and Awards:  
Sigma Xi Best Ph.D. Thesis Award, 2018  
SPIE D.J. Lovell Scholarship, 2016  
National Award for Outstanding Students Abroad, 2015  
MRS Graduate Student Award, 2015

Other Recent Professional Activities:  
Consulting: N/A  
Patents: N/A  
Service:  
Department Seminar Committee  
Ph.D. thesis committee for Carolyn Long (Jamie Grunlan)  
Professional Development: N/A

Percentage of time committed to the program: 100
Name: Reza Langari  

Academic Rank and Title: Professor

Degrees:  
Ph.D. Mechanical Engineering, University of California, Berkeley, 1991  
M.Sc. Mechanical Engineering, University of California, Berkeley, 1983  
B.Sc. Mechanical Engineering, University of California, Berkeley, 1981

Years of Service on Texas A&M Faculty: 28
  
J.R. Thompson Department Head Chair Professor, Engineering Technology and Industrial Distribution, Texas A&M (2013-Present)  
Professor, Department of Mechanical Engineering, Texas A&M (2004-Present)  
Professor (by courtesy), Department of Electrical and Computer Engineering, Texas A&M (2018-Present)  
Professor (by courtesy), Department of Aerospace Engineering, Texas A&M (2005-Present)  
Senior Research Engineer, Texas A&M Transportation Institute (2003-Present)  
Associate Dean Acad. Aff. (Interim), Texas A&M Qatar (2007)  
Professor and Coordinator, Mechanical Engineering, Texas A&M Qatar, (2006-2007)  
Assistant Director and Chief Engineer, Aerospace Vehicle Systems Institute, Texas Engineering Experiment Station (2000-2005)  
Associate Professor, Department of Mechanical Engineering, Texas A&M (1997-2004)  
Assistant Professor, Department of Mechanical Engineering, Texas A&M (1991-1997)

Other Related Experience:  
Faculty Fellow, NASA Ames Research Center, (2000,2002)  
Welliver Fellow, The Boeing Company (1999)  
Research Engineer, United Technologies Research Center (1997-1993)  
Research Scientist, Rockwell International Science Center (1993)  
Research Engineer, Engineering Systems Research Center, University of California, Berkeley (1991)  
Staff Engineer, Measurex Corporation, (1984-1985)

State(s) in which registered: N/A

Undergraduate and Graduate Courses Taught:

Recent Graduate Student Advising:  
Ph.D. Students Advised:  
Kun Huang (in progress), Lin Li (in progress), Sangjin Ko (in progress), Junxia Mi (in progress), Zhou Wang (in progress), Rana Soltani (in progress), Amin Zeiaee (in progress), Fei Shen (in progress)  
M.S. Students Advised:  
Juhsuan Li (in progress)

Five Recent Publications  


Scientific and Professional Society Memberships/Offices:
American Society of Mechanical Engineers (ASME) Fellow

Recent Honors and Awards:

Other Recent Professional Activities:

Consulting: N/A

Patents: N/A

Service:
Editor in Chief, Journal of Intelligent and Fuzzy Systems
Associate Editor, IEEE Transactions on Intelligent Transportation Systems

Professional Development:

Percentage of time committed to the program:
Name: Astrid Layton

Academic Rank and Title: Assistant Professor

Degrees: Ph.D., Mechanical Engineering, Georgia Institute of Technology, 2014
B.S., Mechanical Engineering, Minor in Studio Arts, University of Pittsburgh, 2009

Years of Service on Texas A&M Faculty: 3
Assistant Professor (01/2017-present)

Other Related Experience:
Visiting Lecturer, Georgia Tech Lorraine - Georgia Institute of Technology, (08/2014-12/2016)

State(s) in which registered: N/A

Undergraduate and Graduate Courses Taught:
MEEN 401 Introduction to Mechanical Engineering Design – Lecture
MEEN 401 Introduction to Mechanical Engineering Design – Studio
MEEN 440 Bio-Inspired Engineering Design
MEEN 689 Graduate Bio-Inspired Engineering Design
MEEN 344 Fluid Mechanics

Recent Graduate Student Advising:
Ph.D. Students Advised
Abheek Chatterjee (2018-present)

M.S. Students Advised

Five Recent Publications

Scientific and Professional Society Memberships/Offices:
American Society for Mechanical Engineering - ASME
ASME Design Theory and Methodology Technical Committee - DTM
CIRP LCE Conference Scientific Committee
American Society for Engineering Education - ASEE
Design Society - DESIGN
ASEE Design in Engineering Education Division - DEED
Women in Engineering - WIE
Society for Women in Engineering - SWE
Recent Honors and Awards: N/A

Other Recent Professional Activities:

Consulting: N/A
Patents: N/A
Service:
TAMU Aggie ACHIEVE – College of Engineering Faculty Representative. 2019
TAMU Future Faculty Academy – Graduate Student Mentor. 2019
CLEN289 – MEEN Faculty Invited Speaker. 2019
TAMU New Student Summer Conference – Faculty Panelist. 2018-2019
TAMU Mechanical Engineering Undergraduate Women – Faculty Advisor. 2017-2019
MEEN Departmental Mentoring Committee – Member. 2018-2019
MEEN Departmental Seminar Committee – Member. 2017-2018
TAMU GradSWE – Faculty Panelist. 2017-2018
ENGAGE Summer Camp – Faculty Organizer/Participant. 2017
IDETC2019 Conference – DTM Symposium Organizer. 2019
IDETC2019 Conference – DFMLC Symposium Organizer. 2019
IDETC2018 Conference – DTM Session Co-Chair. 2018
IDETC2018 Conference – DFMLC Symposium Co-Organizer. 2018
IDETC2018 Conference – DTM Symposium Co-Organizer. 2018
IDETC, ICED, CIRP-LCE, ASME, ASEE, DESIGN – Conference Article Reviewer. 2016-2019
Journal of Computing and Information Science in Engineering, ASME Journal of Manufacturing

Professional Development:
TAMU Active Learning in Engineering Program (ALEP). 2019
Grant Writers Seminars and Workshops (GWSW) Proposal Writing Academy. 2019
Story Circles 10-Week Program. 2018
TAMU Writing Center’s Supporting International Students' Writing. 2018
TAMU WE Discussing Growth Mindset Workshop. 2017
TAMU WE Faculty Feedback: It Matters What You Say Workshop. 2017
TAMU ADVANCE Roadmap Workshop. 2017

Percentage of time committed to the program: 100
Name: ChaBum Lee

Academic Rank and Title: Assistant Professor

Degrees: Ph.D., Mechatronics, Gwangju Institute of Science and Technology, 2012
        M.S., Mechatronics, Gwangju Institute of Science and Technology, 2008
        B.S., Mechanical Engineering, Chung-Ang University, 2006

Years of Service on Texas A&M Faculty: 1
        Assistant Professor (2018-present)

Other Related Experience:
        Visiting Research Associate (2019) - National Institute of Standards and Technology (NIST),
        Gaithersburg, MD
        Assistant Professor, Tennessee Tech University (2015-2018)
        Assistant Research Professor, University of South Carolina (2014-2015)
        Postdoctoral Research Associate, University of South Carolina (2013-2014)
        Senior Researcher, LG Display (2011-2013)

State(s) in which registered: N/A

Undergraduate and Graduate Courses Taught:
        MEEN 404-903 Engineering Laboratory
        MEEN 401 Capstone Design
        MEEN 491 Research
        MEEN 260 Mechanical Measurements

Recent Graduate Student Advising:
        Ph.D. Students Advised:
        M.S. Student Advised:
        Heebum Chun (2019)

Five Recent Publications
1. Jaemin Han and ChaBum Lee, Dynamic and thermal characterization of additively manufactured
   pressure-fed flexures with internal fluidic channels, Smart Materials and Structures, 28, 105032 (2019).
2. ChaBum Lee, Gyu-Ha Kim, and Seongkyul Jeon, An optical measurement technique for dynamic
3. ChaBum Lee, A first review of optical edge-diffraction technology for precision dimensional metrology,
4. Herminso Villarraga Gomez, ChaBum Lee, and Stuart T. Smith, Dimensional metrology with X-ray CT:
   a comparison with CMM measurements on internal features and compliant structures, Precision
5. Seongkyul Jeon, Abolfazl Zolfaghari, ChaBum Lee, Dicing wheel wear monitoring technique utilizing
   edge diffraction effect, Measurement, 121, pp. 139-143 (2018).

Scientific and Professional Society Memberships/Offices:
        American Society for Precision Engineering
        American Society of Mechanical Engineers
        Korean Society of Precision Engineering

Recent Honors and Awards:
Best Alumni Award at Gwangju Institute of Science and Technology (2019)
Kinslow Research Award (Honorable Mention) at Tennessee Tech (2017)
American Society for Precision Engineering Student Scholarship Award (2017)
Research and Economic Development Award at Tennessee Tech (2017)

Other Recent Professional Activities:

Consulting: N/A

Patents:
Pressure-fed motion mechanisms, (Pending)
Orthodontic measurement device and method, filed 2017/05/28, US62/507979
Method and device for measuring motion error of linear stage, US8687200 B2(US)
Light-condensing device and method of fabricating the same, CN101576624, (China)
Light-condensing device and method of fabricating the same, US8176912 B2 (US)
Ultrathin light scanning apparatus for portable information device, WO2011162459 A1
Ultra-thin type optical scanning device for portable information appliance, Registration No. 10-1080963 (Korea)
Concentrating lens for LED and designing method thereof, Registration No.10-0989486 (Korea)
Apparatus for optical pointing, Registration No. 10-0977311 (Korea)
Displacement meter including grating mirror having variable grating depth and method for measuring displacement using the same, Registration No. 10-01739 (Korea)
Light-condensing device using diffraction grating and method for fabricating the same, Registration No. 10-0934542 (Korea)
Method of fabricating sawtooth gratings and method of manufacturing diffractive optic elements using thereof, Registration No. 10-0934541 (Korea)
Measurement system of motion error, Registration No. 10-0124907 (Korea)
Method and device for measuring motion error of linear stage, Registration No. 10-0056473 (Korea)
Transmission diffraction device for high diffraction order and method of fabricating the same, Registration No. 10-20100064807 (Korea)

Service:

Professional Development: N/A
Percentage of time committed to the program: 100
Name: Kiju Lee

Academic Rank and Title: Associate Professor

Degrees: Ph.D. in Mechanical Engineering, Johns Hopkins University, 2008
M.S.E. in Mechanical Engineering, Johns Hopkins University, 2006
B.S.E. in Electronics and Electrical Engineering, Chung-Ang University, 2002

Years of Service on Texas A&M Faculty: 1
Associate Professor (2019-present)

Other Related Experience:
Nord Distinguished Assistant Professor, Mechanical and Aerospace Engineering, Case Western Reserve University (2012-2019)
Assistant Professor (Courtesy), Pediatrics, School of Medicine, CWRU (2015-2019)
Core Investigator, Louis Stokes VA Medical Center (2013-2019)
Faculty Associate, Schubert Center for Child Studies, CWRU (2010-2019)
Assistant professor, Mechanical and Aerospace Engineering, CWRU (2008-2019)

State(s) in which registered: N/A

Undergraduate and Graduate Courses Taught:
Case Western Reserve University:
EMAE 488 Advanced Robotics
EMAE 250 Computers in Mechanical Engineering
EMAE 398 Senior Projects
Texas A&M University:
MXET 400 Mechatronics II

Recent Graduate Student Advising:
Ph.D. Students Advised:
M.S. Students Advised:

Five Recent Publications
Scientific and Professional Society Memberships/Offices:
IEEE (Institute of Electrical and Electronics Engineers)
AIAA (American Institution in Aeronautics and Aerospace)
ASME (American Society of Mechanical Engineers)

Recent Honors and Awards:

Other Recent Professional Activities:

Consulting: N/A

Patents:
Socio-Biosensors by K. Lee (100%). US Patent No. US9968296B2
Soft Robotic Hand using Novel TWISTER Mechanism by K. Lee (100%). Provisional Patent filed on October 10, 2018
Actively Transformable Wheel Design with Passive Mechanism by K. Lee (100%). Provisional Patent filed on April 18, 2019

Service:
Associate Editor, IEEE Conference on Games, Entertainment, and Media (2018)
Associate Editor, IEEE Robotics & Automation Letters (2018-present)
Associate Editor, Ubiquitous Robotics (2018)
Chair of the Workshop Organizing Committee, IoT-Enabled Smart Firefighting Workshop, Case Western Reserve University (2018)

Professional Development: N/A

Percentage of time committed to the program: 33

Name: Heather Lewis  Academic Rank and Title: Lecturer

Degrees: M.E, Integrated Manufacturing Systems Engineering, North Carolina State University, 2000
B.S., Mechanical Engineering, Pennsylvania State University, 1996

Years of Service on Texas A&M Faculty: 3
Lecturer/Advisor, (2017-present)

Other Related Experience:
Lecturer, Oklahoma State University, (2016-2017)
Senior Design Engineering, Oklahoma State University, (2011-2017)
Engineering Education Specialist, Oklahoma State University, (2011-2011)
K-12 Outreach Coordinator, Academic Advisor & Instructor, North Carolina State University, (2005-2010)
Design Engineer, Caterpillar Building Construction Products Division, (2001-2006)
Analyst/Consultant, Duggan & Thoades, LLC., Pittsburgh, PA, (2000)
Quality Engineer, John Deere Turf Care, Fuquay-Varina, NC, (1999-2000)

State(s) in which registered: N/A

Undergraduate and Graduate Courses Taught:
Texas A&M University:
MEEN 210 Geometric Modeling for Mechanical Design
MEEN 401 Introduction to Mechanical Engineering Design Studio
MEEN 402 Intermediate Mechanical Engineering Design Lecture & Studio
Oklahoma State University:
ENGR 1111 Introduction to Engineering
ENGR 1113 Introduction to Engineering Mathematics
ENGR 1322 Engineering Design with CAD
ENGR 1332 Engineering Design with CAD and MAE
North Carolina State University
E 101 Introduction to Engineering and Problem Solving

Recent Graduate Student Advising: N/A

Five Recent Publications: N/A

Scientific and Professional Society Memberships/Offices: N/A

Recent Honors and Awards:
Nominated for College of Engineering Instructional Faculty Teaching Award Fall 2018
Completed Leadership Development Program (Oklahoma State University) 2017
2018-2019 MEEN ASME Chapter Students’ Choice Professor of the Year, Texas A&M
2014 College of Engineering Outreach and Extension Excellence Award, Oklahoma State

Other Recent Professional Activities:
Consulting: N/A

Patents: N/A

Services:
MEEN Honors Advising Committee, 2018
Career Advising - MEEN students. 2017 – present
Mentor, First Generation Engineering Student Mentoring Program, 2018
Steering Committee Member, Stillwater Middle School Engineering Program, 2016 - 2017
Presenter, Stillwater Middle School Girls Engineering Club, 2011 - 2017
Professional Development: N/A

Percentage of time committed to the program: 100
Name: Ying Li  
**Academic Rank and Title:** Associate Professor

**Degrees:**  
- Ph.D., Environmental Engineering Sciences, University of Florida, 2007  
- M.S., Mechanical Engineering, Lehigh University, 2004  
- M.E., Thermal Engineering, Zhejiang University, 2002  
- B.E., Thermal Engineering, Zhejiang University, 1999

**Years of Service on Texas A&M Faculty:** 5  
- Director of Graduate Programs (2018-Present)  
- Associate Professor (2014-Present)

**Other Related Experience:**  
- Assistant Professor, University of Wisconsin-Milwaukee (2009-2014)  
- Postdoctoral Fellow, Washington University in St. Louis (2007-2009)

**State(s) in which registered:** N/A

**Undergraduate and Graduate Courses Taught:**  
- MEEN 681 Graduate Seminar  
- MEEN 439/689 Solar Energy Engineering  
- MEEN 315 Principles of Thermodynamics  
- MEEN 402 Intermediate Design  
- MEEN 678 Aerosol Mechanics

**Recent Graduate Student Advising:**  
- Ph.D. Students Advised:  
  - John Pellesier (Expected 2023), Zichen Du (Expected 2021), Tianzhu Fan (Expected 2021), Yang Gang (Expected 2021), Xuhui Feng (Expected 2020), Wei Deng (2019), Huilei Zhao (2017)  
- M.S. Students Advised:  

**Five Recent Publications**  
Scientific and Professional Society Memberships/Offices:
American Society of Mechanical Engineers (ASME): Member
American Chemical Society (ACS): Member
Electrochemical Society (ECS): Member

Recent Honors and Awards:
ACS-PRF New Directions Award, 2017
Pioneer Natural Resources Faculty Fellow III, Texas A&M, 2014
NSF CAREER Award, 2013
UWM College of Engineering and Applied Science Millionaires’ Club Award, 2013

Other Recent Professional Activities:

Consulting: N/A

Patents: N/A

Service:
Associate Editor, *Engineered Science*, 2018
Panelist and reviewer for NSF, DOE, ACS and other funding agencies
Reviewer for more than 40 international journals
Organizer, Symposium on Remediation of Wastewater from Energy Usage, at American Chemical Society National Meeting, 2018
Session organizer, International Conference on Carbon Dioxide Utilization, 2013
Organizer, Symposium on CO₂ Capture, Sequestration, Conversion and Utilization at American Chemical Society National Meeting, 2013
Guest editor: Special issue on CO₂ Capture, Sequestration, Conversion and Utilization, for the journal of *Aerosol and Air Quality Research*, 2013
Session chair, Electrochemical Society Annual Meetings, 2015, 2016, 2018
Educational outreach in collaboration with Texas A&M CoE & TEES Enrichment Experiences in Engineering, NSF Research Experience for Teachers (RET) supplement
Faculty mentor for the UWM NSF-RET site, 2012, 2013, and 2014

Professional Development: N/A

Percentage of time committed to the program: 100
Name: Hong Liang  

Academic Rank and Title: Professor

Degrees:  
Ph.D., Stevens Institute of Technology, 1992  
M.S., Stevens Institute of Technology, 1987  
B.S., University of Science & Technology Beijing, 1983

Years of Service on Texas A&M Faculty: 15  
Professor (2010-Present)  
Associate Professor (2004-2010)

Other Related Experience:  
Visiting Scientist, Lawrence Livermore National Laboratory (2010-2012)  
Visiting Scientist, Lawrence Berkeley National Laboratory (2010-2011)  
Visiting Scholar, Massachusetts Institute of Technology (2004-2005)  
Associate /Assistant Professor, Mechanical Engineering, University of Alaska Fairbanks, (1998-2004)  
Invited Visiting Professor, Ecole Centrale de Lyon (2003 & 2001)  
Guest Professor, Argonne National Laboratory (2000 & 1999)  
Senior Scientist, Cabot Corporation (1996-1998)  
Senior Process Engineer, Union Carbide Inc. (1994-1996)  
Postdoctoral Associate, National Institute of Standards and Technology (1992-1994)

State(s) in which registered: N/A

Undergraduate and Graduate Courses Taught:  
MEEN 222 Materials Science  
MEEN 460/660 Corrosion Engineering  
MEEN 475 Materials in Design  
MEEN 616 Surface Science

Recent Graduate Student Advising:  
Total Ph.D. graduated: 30; M.S. graduated: 30

Five Recent Publications  

Scientific and Professional Society Memberships/Offices:  
Executive Committee: Society of Tribologists and Lubrication Engineers, 2020-2025 (President: 2023)
Editor-in-Chief: Tribology International
Reginal Editor: IOP Surface Topography Metrology and Properties

Recent Honors and Awards:
Swanson Fellow of American Society of Mechanical Engineers, 2018-2019
William Keeler Memorial Award, College of Engineering, 2016-2017
William O. and Montine P. Head Faculty Fellow, College of Engineering, 2014-2015
2014 Best Application Paper in IIE Transactions Focused Issue on Quality and Reliability Engineering
Fellow of American Society of Mechanical Engineers
Fellow of Society of Tribologists and Lubrication Engineers
Charles H. Barclay, Jr. 45 Faculty Fellows, Texas A&M College of Engineering

Other Recent Professional Activities:

Consulting: N/A

Patents:

Service:
Board of Directors, Society of the Tribologists and Lubrication Engineers, 2007 – 2013
External Advisory Board: Arkansas EPSCORE Program, 2018 – Present
Graduate Program Review Committee, 2012-2013

Professional Development:
Advanced Manufacturing science policy, NIST, 2018-2019

Percentage of time committed to the program: 100
Name: Chao Ma

Academic Rank and Title: Assistant Professor

Degrees: Ph.D. in Mechanical Engineering, University of California, Los Angeles, 2015
M.S. in Mechanical Engineering, University of Wisconsin–Madison, 2012
B.E. in Mechanical Engineering and Automation, Tsinghua University, 2010
B.A. in Economics, Tsinghua University, 2010

Years of Service on Texas A&M Faculty: 3
Assistant Professor, Manufacturing and Mechanical Engineering Technology (2016-present)

Other Related Experience: N/A

State(s) in which registered: N/A

Undergraduate and Graduate Courses Taught:
Manufacturing and Assembly Processes
Product Design and Solid Marketing

Recent Graduate Student Advising:
Ph.D. Students Advised:
Quinton Porter (2022), Mohammadamin Moghadasi (2022), Jianchi Huang (2022), Guanxiong Miao (2022), Ming Li (2022), Wenchao Du (2022)
M.S. Students Advised:

Five Recent Publications

Scientific and Professional Society Memberships/Offices:
Technical Committee Member, Manufacturing Process, Manufacturing Engineering Division, American Society of Mechanical Engineers (ASME)
Member, American Society of Mechanical Engineers (ASME)
Member, American Society for Engineering Education (ASEE)

Recent Honors and Awards:
Best Organizer of Symposium and Session Award, the 14th American Society of Mechanical Engineers (ASME) International Manufacturing Science and Engineering Conference, 2019
Best Paper Award, Manufacturing Division, the 126th American Society of Engineering Education (ASEE) Annual Conference and Exposition, 2019
Charlotte and Walter Buchanan Faculty Fellow, Texas A&M University, 2018
Honorable Paper Award, the 8th International Conference on MicroManufacturing, 2013
Outstanding Paper Award, the 6th International Conference on MicroManufacturing, 2011
Outstanding Graduate, Tsinghua University, 2010

Other Recent Professional Activities:

Consulting: N/A

Patents:

Service:
Symposium Organizer, Additive Manufacturing of Ceramics, Concretes, and Composites, The ASME International Manufacturing Science and Engineering Conference, 06/2019-06/2020
Symposium Organizer, Additive Manufacturing of Ceramics, Concretes, and Composites, The ASME International Manufacturing Science and Engineering Conference, 06/2018-06/2019 (Best Organizer of Symposium and Session Award)
Symposium Organizer, Advances in Metal Matrix Nanocomposites, The ASME International Manufacturing Science and Engineering Conference, 06/2017-06/2018

Professional Development: N/A

Percentage of time committed to the program: Courtesy appointment
Name: Richard Malak                 Academic Rank and Title: Associate Professor

Degrees:  Ph.D., Mechanical Engineering, Georgia Institute of Technology, 2008
           M.S., Mechanical Engineering, Georgia Institute of Technology, 2005
           M.S., Electrical and Computer Engineering, Carnegie Mellon University, 2000
           B.E., Electrical and Computer Engineering, Stony Brook University, 1998

Years of Service on Texas A&M Faculty: 10
       Associate Professor (2015-present)
       Assistant Professor (2009-2015)

Other Related Experience:
       Program Director, National Science Foundation (2016-2019)
       Instructor, Georgia Tech Lorraine (2009)

State(s) in which registered: N/A

Undergraduate and Graduate Courses Taught:
       MEEN 601 Advanced Product Design
       ENGR 401/402 Interdisciplinary Design
       MEEN 357 Engineering Analysis for Mechanical Engineers
       MEEN 689 Model-based Design of Engineered Systems

Recent Graduate Student Advising:
       Ph.D. Students Advised:
       Edgar Galvan (2012-2016), Sean Vermillion (2013-2016), Tanner Kirk (2017-present), Jonathan
       Weaver-Rosen (2018-present), Anirban Chakraborty (2019-present)
       M.S. Students Advised:

Five Recent Publications
Additively Manufactured Functionally Graded Materials” ASME Journal of Mechanical Design. 140(11).
Parametric Optimization Algorithm with Application to a Multi-physical Engineering System.”
Structural and Multidisciplinary Optimization. 58(2) 489-509.
on Using Serious Gaming to Study Human Decision-making in Engineering Contexts” Design Science.
Magnetohydrodynamic Liquid Metal Active Cooling Concept” ASME Journal of Mechanical Design.
138(3) 031402-031402-11. DOI: 10.1115/1.4032268.
Structures: A Synthesis and Review,” Smart Materials and Structures. 23(9) 094001.

Scientific and Professional Society Memberships/Offices: N/A
Recent Honors and Awards:
- Gulf Oil/Thomas A. Dietz Faculty Fellow, 2017–present
- Texas A&M Engineering Experiment Station (TEES) Young Faculty Fellow Award, 2014
- Lockheed Martin Teaching Excellence Award, College of Engineering, Texas A&M University, 2014
- Morris E. Foster Faculty Fellow I in Mechanical Engineering, College of Engineering, Texas A&M University, 2014
- Engineering Genesis Award for Multidisciplinary Research, College of Engineering, Texas A&M University, 2014
- Peggy L. and Charles L. Brittan ’65 Teaching Award for Outstanding Undergraduate Teaching, Department of Mechanical Engineering, Texas A&M University, 2013

Other Recent Professional Activities:
- Consulting: N/A
- Patents: N/A
- Service:
  - National Science Foundation (NSF) Program Director, Division of Civil, Mechanical and Manufacturing Innovation, 2016 –2019
  - American Society of Mechanical Engineers (ASME) Past Chair & Awards Chair, Systems Engineering Information and Knowledge Management (SEIKM) Technical Committee, CIE Division, 2012 –2013
  - ASME, Chair, Systems Engineering Information and Knowledge Management (SEIKM) Technical Committee, CIE Division, 2011 –2012
  - ASME, Vice-chair, Systems Engineering Information and Knowledge Management (SEIKM) Technical Committee, CIE Division, 2010 –2011
  - Member, ASME CIE division. 2009 – present
  - ASME, Member, SEIKM Technical Committee, CIE Division. 2009 – present.
  - Awards Chair, SEIKM Technical Committee, 2013 ASME Computers and Information in Engineering Conference
  - Member of International Scientific Committee, 10th International Conference on Product Lifecycle Management, 2013
  - Member of Program Committee, 2013 Conference on Systems Engineering Research Conference Chair, SEIKM Technical Committee, 2012 ASME Computers and Information in Engineering Conference
  - Member of International Scientific Committee, 9th International Conference on Product Lifecycle Management, 2012
  - Program Chair, SEIKM Technical Committee, 2011 ASME Computers and Information in Engineering Conference
  - Organizer, Special Symposium on Advances in the Engineering of Large Scale and Complex Systems, held at 2011 ASME IDETC/CIE Conference
  - Co-organizer, Special Symposium on Dynamic Enterprise Architecture, held at 2012 ASME IDETC/CIE Conference
  - Have chaired or co-chaired over a dozen different sessions at several national and international conferences
  - Guest Judge, Jr. Design Project Competition, Oregon State University, 2009
  - Member, Committee to define an interdisciplinary Master’s degree in Systems Engineering, 2013-2015
  - Faculty Search Committee, 2014-2016
Education Development Committee, 2013-2015
Advisory Committee, 2013-present
Distance Learning Committee, 2013-2014
Strategic Planning Committee, 2013-present.
Ad-hoc committee on capstone design program, 2012-2013
Guest Judge, Materials Advantage Student Research Poster Competition, 2012
Liaison to departmental librarian, MEEN Department, Fall 2012-Present
Presenter for ENGR 111-112 Lecture “What is MEEN?” 2009, 2010
Guest Lecture, “Introduction to Product Design: Inspiration to Innovation, with Just a Little Perspiration.” Engineering Products in Community Service Program, 2011
Judge, Undergraduate Summer Research Grants Poster Competition. 2010, 2011.

**Professional Development:** N/A

**Percentage of time committed to the program:** 100
Name: Oliver Mathieu  Academic Rank and Title: Research Associate Professor

Degrees: Ph.D., Physical Chemistry – Applied Chemical Kinetics, University of Orléans, 2006
M.A., Chemical Kinetics applied to Combustion, University P. and M. Curie, 2003
B.A., Chemistry, University of Orléans, 2001

Years of Service on Texas A&M Faculty: 2

Other Related Experience:

State(s) in which registered: N/A

Undergraduate and Graduate Courses Taught: N/A

Recent Graduate Student Advising: Tatyana Atherley (Co-advisor)

Five Recent Publications

Scientific and Professional Society Memberships/Offices:
Member of the Combustion Institute

Recent Honors and Awards:
Japan Society for the Promotion of Science Fellowship Award, 2017
Best Knowledge Manager, Saudi Aramco R&D center, 2010

Other Recent Professional Activities:
Consulting:
Solar Gas Turbines

Patents: N/A

Service:
Session chair at various conferences
Secretary of the Saudi Arabian Section of the Combustion Institute in 2009-2010
Co-organized the “FFL206 Kinetically Controlled CI Combustion (Including HCCI)-Diesel” session at the SAE Powertrains, Fuels and Lubricants Meeting in San Diego, October 201
Reviewer for international conferences: SAE Fuel and Lubricants, ICDERS, Turbo Expo and International Symposium on Combustion
Reviewer for an AAAS Joint Center International Proposal.
Proposal reviewer for the National Science Foundation (Combustion and Fire Systems (ENG/CBET) panel)
Proposal reviewer for the Natural Sciences and Engineering Research Council of Canada (NSERC)

Professional Development:

Percentage of time committed to the program: 100
Name: Daniel A. McAdams  

Academic Rank and Title: Professor

Degrees:
- Ph. D. Mechanical Engineering, The University of Texas at Austin, 1999
- M.S. Mechanical Engineering, California Institute of Technology, 1994
- B.S.M.E. The University of Texas at Austin, 1992

Years of Service on Texas A&M Faculty: 12
- Professor (09/20015-present)
- Associate Professor (2008-2015)

Other Related Experience:
- Associate Professor, Missouri University of Science and Technology, Department of Mechanical and Aerospace Engineering, (09/2005–12/2007)
- Assistant Professor, Missouri University of Science and Technology, Department of Mechanical and Aerospace Engineering, (10/1999–08/2005)
- Assistant Instructor, The University of Texas at Austin, 09/1997-05/1998

State(s) in which registered: N/A

Undergraduate and Graduate Courses Taught:
- MEEN 368 Solid Mechanics in Mechanical Design
- MEEN 475 Materials in Design
- MEEN 601 Advanced Product Design
- MEEN 401 Introduction to Mechanical Engineering Design Lecture
- MEEN 402 Intermediate Design Lecture
- MEEN 440 Bioinspired Engineering Design
- MEEN 441 Design of Mechanical Components and Systems
- MEEN 613 Engineering Dynamics
- MEEN 401/402 Introduction to Mechanical Engineering Design Studio

Recent Graduate Student Advising:
- Ph.D. Students Advised
- M.S. Students Advised

Five Recent Publications


Scientific and Professional Society Memberships/Offices:
- American Society of Engineering Education.
- American Society of Mechanical Engineers (Fellow).
- Tau Beta Pi Engineering Honor Society.
- Pi Tau Sigma Mechanical Engineering Honor Society.

Recent Honors and Awards:
- Texas A&M Association of Former Students Distinguished Achievement Award for Individual Student Relations, 2018
- Invited Speaker, Gordon Research Conference on Multifunctional Materials and Structures, Ventura, CA, 2018
- Outstanding Faculty Mentor Award; Texas A&M Department of Mechanical Engineering, 2017
- Herbert H. Richardson Faculty Fellow Award, 2016-2017
- Mechanical Engineering Industrial Advisory Council Outstanding Faculty Contribution Award, 2015
- Herbert H. Richardson Faculty Fellow Award, 2014-2015
- Dwight Look College of Engineering Dean’s Fellow, 2014-2015
- Design Studies Award, for the best paper published in the journal Design Studies, 2012

Other Recent Professional Activities:
Consulting:
- Boeing Welliver Fellow, Various sites, June – August 2006
- Consulting Engineer, Little Tykes Commercial Playground Equipment, Farmington Missouri, October 2004
- Consulting Engineer, Metastable Instruments, St. Louis, Missouri, July 2001
- Visiting Engineer, EASI Engineering, Warren, Michigan, October-December 1999
- Consulting Engineer, Dr. Saf Asghar, Austin, Texas, Spring 1997
- Design Engineer, JAMAK Manufacturing, Weatherford, Texas, June-August 1990

Patents: N/A

Service:
- Committee of Visitors, NSF CMMI program review, 2019
- College of Engineering Honors and Awards Committee, appointed, 2019-2021.
- Associate Mechanical Engineering Department Head for Research and Strategic Initiatives, Texas A&M, January 2019 - current
- Director, Undergraduate Programs, Texas A&M Department of Mechanical Engineering, 2019 - current.
- Associate Department Head for Graduate Programs, 2017 –2019.
Graduate Program Review, University of South Florida, Mechanical Engineering, 2018.
Associate Editor (guest), Artificial Intelligence for Engineering Design, Analysis and Manufacturing, Special Issue on Engineering Design Informatics, 2015-16.
Curriculum Reform Committee, Member, 2016-2017.
Graduate Studies and Research Committee, chair, appointed, 2014-2018.
Engineering Innovation Center Advisory Committee, member, appointed, fall 2013-2014.
Design Computing and Cognition '12, best paper committee member.
Committee Chair, ASME Design Theory and Methodology Technical Committee, 2010-2013.
Chair, Ad hoc ASME Design Theory and Methodology Award Creation Committee, 2011.
Program Chair, ASME Design Theory and Methodology Conference, 2009.
Departmental Growth Committee, member, appointed, 2014-current.
Seminar Committee, chair, appointed, 2014-current.
Strategic Planning Committee, member, appointed, 2014-current.
Distance Learning Committee, member, appointed, 2014-current.
Senior Design Course Coordinator (MEEN 401/402) 2014-current.
Industrial Advisory Council, Industrial Liaison Subcommittee, Department Representative, appointed, 2014-2016.
Chair, Mechanical Engineering faculty search committee, 2015-2016.
Host, Mechanical Engineering Graduate Research Seminar, Dr. Jensen, Fall 2015.
Mechanical Engineering Educational Development Committee, member, elected, 2014-2015.
Mechanical Engineering Advisory Committee to the Department Head, member, appointed, 2014-current.
Non-tenure Track Faculty Search Committee, appointed, 2014.
Director, Senior Design Projects Program, Mechanical Engineering, Texas A&M, director, July 2012-2015.
Mechanical Engineering Advisory Committee to the Department Head, member, elected, 2013-2014.
Mechanical Engineering Honors and Awards Committee, member, elected, 2013-2014.
Mechanical Engineering Educational Development Committee, member, elected, 2013-2014.
Ad Hoc Committee for the Resource Needs and Course Structure for MEEN Sr. Design 401/2, Chair, appointed, 2013.
Host, Mechanical Engineering Graduate Research Seminar, Dr. David Hu, Fall 2013.
Mechanical Engineering faculty search committee, 2012-2013.
Host, Mechanical Engineering Graduate Research Seminar, Dr. Jenkins, Fall 2012.
Mechanical Engineering faculty search committee (TAMUQ), 2012.
Mechanical Engineering faculty search committee, 2011-2012.
Host, Mechanical Engineering Graduate Research Seminar, Dr. Thompson, Spring 2012.
Host, ABET Reviewer Classroom Visit, Fall 2010.
Host, Mechanical Engineering Graduate Research Seminar, Dr. Simpson, Fall 2010.
Host, Mechanical Engineering Graduate Research Seminar, Dr. Saygin, Fall 2009.
Chair, Mechanical Engineering faculty search committee, 2008-2009.

Professional Development:
Visiting Professor, ETH Zurich, Fall 2018.
Faculty Leader, Spain Study Abroad Mechanical Engineering Track, Texas A&M, 2018
Faculty Leader, Spain Study Abroad Mechanical Engineering Track, Texas A&M, 2011
Boeing Welliver Fellowship, Seattle, WA, St. Louis, MO, and Los Angeles, CA, 2006.
ASEE/National Effective Teaching Institute, Montreal, Canada, 2002.
The University of Missouri System New Faculty Teaching Scholars Program, 2001-2002.
University of Missouri - Rolla PACE representative to Universities in Europe, 2001.
Participant at the Integrating Design into Education Conference, Dallas, Texas, 2001.

Percentage of time committed to the program: 100
Name: Tillie McVay  
**Academic Rank and Title:** Associate Professor of Instruction

**Degrees:**
- Ph.D., Aerospace Engineering, Texas A&M University, 1996
- M.S., Petroleum Engineering, Texas A&M University, 1982
- B.S., Petroleum Engineering, Colorado School of Mines, 1981

**Years of Service on Texas A&M Faculty:** 18  
- Associate Professor of Instruction (2016-Present)  
- Undergraduate Program Director (2017-2018)  
- Senior Lecturer (2014-2016)  
- Lecturer (2005-2014)  
- Lecturer, Aerospace Engineering (2001-2006)

**Other Related Experience:**
- Senior Project Engineer, Exxon Company (1982-1986)  

**State(s) in which registered:** N/A

**Undergraduate and Graduate Courses Taught:**
- MEEN 221 Statics and Particle Dynamics  
- MEEN 260 Mechanical Measurements  
- MEEN 357 Engineering Analysis for Mechanical Engineers  
- MEEN 401 Introduction to Mechanical Engineering Design  
- MEEN 402 Intermediate Design  
- MEEN 404 Engineering Laboratory  
- ENGR 111 Foundations of Engineering I  
- ENGR 112 Foundations of Engineering II  
- AERO 310 Aerospace Dynamics  
- AERO 320 Numerical Methods

**Recent Graduate Student Advising:** N/A

**Five Recent Publications**

**Scientific and Professional Society Memberships/Offices:**

**Recent Honors and Awards:**
- Texas A&M College of Engineering, Instructional Faculty Teaching Award, 2016
- Recipient of Peggy and Charles Brittan Teaching Award for Outstanding Undergraduate Teaching, 2011

**Other Recent Professional Activities (conference presentations):**
- McVay, M. W., Srinivasa, A. R.: “Class Demonstrations and Online Activities Used for Higher Level Learning”, presented at Mid Years Engineering Experience Conference, College Station, TX (March 31-April 1, 2016)  
- Kim, N., McVay M.W., Srinivasa A.R., Impact of Classroom Demonstrations and Surveys on Higher-
Consulting: N/A

Patents: N/A

Service: N/A

Professional Development:

Percentage of time committed to the program: 100
Name: Waqar Mohiuddin  Academic Rank and Title: Research Assistant Professor

Degrees: Ph.D., Biomedical Science, Texas A&M University, 2008
M.S., Mechanical Engineering, Texas A&M University, 2002
B.S., Mechanical Engineering, Bangladesh University of Eng. & Technology, 1998

Years of Service on Texas A&M Faculty: 2
Assistant Professor of Research (2017-Present)

Other Related Experience:
Senior Scientist, Prolégon Biotechnologies, LLC. (2016-2017)
Research Scientist-II, Lynntech Inc. (2014-2016)
Associate Research Engineer, Jointly with Pediatric Cardiovascular Surgery, University of Texas Health Science Center at Houston and Michael E. DeBakey Institute, Texas A&M, (2008-2014)
Pre-doctoral Research Fellow, Michael E. DeBakey Institute, Texas A&M, (2003-2008)

State(s) in which registered:
“Engineer-in-Training” (#36587) by the Texas Board of Professional Engineers

Undergraduate and Graduate Courses Taught:
MEEN 210
MEEN 401
MEEN 402
MEEN 404

Recent Graduate Student Advising:
None

Five Recent Publications

Scientific and Professional Society Memberships/Offices:

Recent Honors and Awards:
College-level ‘Outstanding Research Fellow’ award, Texas A&M University, 2012
International Education Award, International Students Services, Texas A&M, 2006
Graduate Merit Award, Dept. of Physiology and Pharmacology, Texas A&M, 2005
Other Recent Professional Activities:

Consulting: N/A

Patents: N/A

Service:
Manuscript Review
IEEE EMB Transactions of Biomedical Engineering
Annals of Biomedical Engineering
Journal of Vascular Research
Grant Review
Ad hoc Reviewer, American Heart Association (National Bioeng BSc 3 Section), 2010-2012

Professional Development:

Percentage of time committed to the program: 100
Name: Michael R. Moreno  Academic Rank and Title: Assistant Professor

Degrees:  Ph.D. Biomedical Engineering, Texas A&M, 2009
          M.S. Biomedical Engineering, Florida International University, 2003
          M.S Science Education, Florida International University, 1997
          B.S Physics Education, Florida International University, 1996

Years of Service on Texas A&M Faculty: 5
  Assistant Professor (2014–present)

Other Related Experience:
  Director of Innovation for Engineering Medicine, Texas A&M (2019 – Present)
  Director of Biomechanics Research and Engineering, Houston Methodist Hospital, Department of Orthopedics and Sports Medicine (2015 – 2019)
  Research Assistant Professor and Lecturer, Texas A&M (2010 – 2014)
  Engineer, CorInnova Inc. (2007 – 2010)
  Research Engineer & Lecturer, Texas A&M, Biomedical Engineering (2003 – 2010)

State(s) in which registered: N/A

Undergraduate and Graduate Courses Taught:
  MEEN 344 Fluid Mechanics
  MEEN 260 Mechanical Measurements
  MEEN 440-689 Bio-Inspired Engineering Design
  MEEN 489-689 Comparative Biomechanics
  ENGR 689 Introduction to Engineering Innovation in Medicine
  BMEN 341 Biofluid Mechanics
  BMEN 448 Healthcare Technology in the Developing World
  BMEN 458 Motion Biomechanics

Recent Graduate Student Advising
  Ph.D. Students Advised:
  M.S. Students Advised:

Five Recent Publications


Scientific and Professional Society Memberships/Offices:
- American Society of Mechanical Engineers (ASME)
- Biomedical Engineering Society (BMES)
- Orthopedic Research Society (ORS)
- American Association of Engineering Education (ASEE)
- American Society of Testing and Measurement (ASTM)
- American Association for the Advancement of Science (AAAS)
- European Society of Biomechanics (ESB)
- American Heart Association (AHA)

Recent Honors and Awards:
- J. Mike Walker ’66 Faculty Fellowship
- EnMed Faculty Fellowship Award 2019
- The Academy of Medicine, Engineering, and Science of Texas (TAMEST) Protégé 2017
- Dean of Engineering Excellence Award 2016
- TEES Young Faculty Fellow Award 2016
- ASME Bioengineering Division Skalak Award for Best Paper, 2012
- ASEE / NSF Post-Doctoral Fellowship, 2010
- SLATE Award for Teaching Excellence, 2009
- Gramm Doctoral Fellowship “for excellence in scholarly research and teaching”, 2009

Other Recent Professional Activities:

Consulting: N/A

Patents and Invention Disclosures:
Michael R. Moreno, Steve Zambrano*, W. Brian Saunders. Experimental Validation Instrument for
Veterinary Orthopedics (Ex Vivo) Simulator: Development of a System for Evaluation of Biomechanical Orthopedic Techniques in Ex Vivo Veterinary Specimens, Provisional Patent 62/298,878 issued September 2015

Service:
ASME Bioengineering Division – Chair of the Design, Dynamics, and Rehabilitation Committee, 2019 – present
ASME Bioengineering Division – Vice Chair of the Design, Dynamics, and Rehabilitation Committee, 2016 – 2018
Organized NSF-sponsored Undergraduate Student Design Competition for 2017 Summer Biomechanics, Bioengineering, and Biotransport Conference and the 2018 World Congress of Biomechanics
Organized FDA Mini-Symposium on Design and Approval of Medical Devices for the Summer Biomechanics, Bioengineering, and Biotransport Conference, 2016
NSF Graduate Research Fellowship Program Review Panel, 2013 – present
Advisor Network of the Texas Medical Center Accelerator
ASME Bioengineering Division - Skalak Award Review Panel, 2016
Biomechanical Instrumentation Session Chair – World Congress of Biomechanics 2014
ASME Bioengineering Conference Design & Devices Committee Chair, 2013-2015
ASME Bioengineering Conference Cardiovascular Devices Session Co-Chair, 2012
College of Engineering Junior Faculty Advisory Committee, 2017 to present
Director Engineering World Health Summer Institute in Rwanda, 2017 to Present
Department of Biomedical Engineering Faculty Search and Screen Committee, 2017
Department of Mechanical Engineering Faculty Advisory Committee, 2016 to present
College of Engineering Diversity Fellowship Review Committee, 2016

Professional Development:

Percentage of time committed to the program: 100
Name: Anastasia Muliana  

Academic Rank and Title: Professor

Degrees:  
Ph. D, Structural Engineering & Mechanics, Georgia Institute of Technology 2004  
M.S, Civil Engineering, Georgia Institute of Technology, 1999  
B.S, Civil Engineering, Bandung Institute of Technology, 1997, cum laude

Years of Service on Texas A&M Faculty: 15  
Paul Pepper ’54 Professor (2017-Present)  
Professor (2015-Present)  
Associate Professor (2010-2015)  
Assistant Professor (2004-2010)

Other Related Experience: N/A

State(s) in which registered: N/A

Undergraduate and Graduate Courses Taught:
MEMA 651 Viscoelastic of Solids and Structures  
MEEN 689/657 Design and Modeling and Viscoelastic Structures  
MEEN 689 Linear Elasticity  
MEEN 688 Advanced Solid Mechanics  
CVEN Mechanics of Materials  
MEEN 221 Statics and Particle Dynamics  
MEEN 225 Engineering Mechanics  
MEEN 368 Solid Mechanics and Mechanical Design  
MEEN 451 Viscoelastic Materials

Recent Graduate Student Advising:
Ph.D. Students Advised:  
M.S. Students Advised:  

Five Recent Publications
Scientific and Professional Society Memberships/Offices:
American Society of Composites, 2004-present
American Institute of Aeronautics and Astronautics, 2003-2006
American Society of Mechanical Engineers, 2006-present

Recent Honors and Awards:
ASME Fellow 2016
William Keeler Memorial Award, 2016
TEES Faculty Fellow 2016
Cain Faculty Fellow I, 2016-2019
William Keeler Memorial Award, 2015
The Dean of Engineering Excellence Award, COE, Texas A&M, 2015

Other Recent Professional Activities:
Consulting:
Modeling viscoelastic responses of polymer and polymer composites, Polymer Competence Center

Patents: N/A

Service:
Chair, SPIE Smart Structures + Nondestructive Lifetime Achievement Award 2020
Co-chair, SPIE Smart Structures + Nondestructive Evaluation meeting as a Symposium 2020 - 2021
Vice Chair of Applied Mechanics Division Composites, AMSE, 2017-present
Editorial board Composite Structures, 2016-present
Associate Editor, ASME J. Engineering Materials and Technology, 2018-Present
Graduate Studies Committee, Department of Mechanical Engineering, 2007-13, 2017
Strategic Planning Committee, Department of Mechanical Engineering, 2016-2018
Tenure and Promotion Committee, Department of Mechanical Engineering, 2017-2019
Faculty Advisory Committee, Department of Mechanical Engineering, 2016-present (Chair in 2018)
Graduate Enhancement Fee Ad-hoc Committee, College of Engineering, 2017-2018
COE Faculty Ombudsperson, Fall 2019-present

Professional Development: N/A

Percentage of time committed to the program: 100
Name: Alan Needleman

Academic Rank and Title: TEES Eminent Professor

Degrees:
Ph.D. Harvard University, 1971
M.S. Harvard University, 1967
B.S. University of Pennsylvania, 1966

Years of Service on Texas A&M Faculty: 5
University Distinguished Professor & TEES Eminent Professor, Mechanical Engineering jointly with Materials Science and Engineering (2019-present)
TEES Distinguished Research Professor and Professor of Materials Science and Engineering (2015-present)
TEES Distinguished Research Professor (2014)
TIAS Fellow and Visiting Professor (2013)

Other Related Experience:
Professor of Materials Science and Engineering, University of North Texas (2009-2014)
Visiting Professor, University of North Texas (2007-2009)
Professor Emeritus, Florence Pirce Grant University, Brown University (2009-present)
Professor, Florence Pirce Grant University, Brown University (1996-2009)
Professor of Engineering, Brown University (1981-2009)
Associate Professor of Engineering, Brown University, (1978-2009)
Assistant Professor of Engineering, Brown University, (1975-1978)
Assistant Professor of Applied Mathematics, M.I.T., (1972-1975)

State(s) in which registered: N/A

Undergraduate and Graduate Courses Taught: N/A

Recent Graduate Student Advising: N/A

Five Recent Publications

Scientific and Professional Society Memberships/Offices:
Fellow, National Academy of Engineering
Fellow, American Society of Mechanical Engineers
Recent Honors and Awards:
- Mindlin Lecture, Columbia University, 2015
- Talbot Lecture, University of Illinois Urbana-Champaign, 2014
- Honorary Professor, Dalian University of Technology (China), 2014
- Frank Otto Distinguished Lecture, State University of New York at Stony Brook, 2013
- Texas A&M Institute of Advanced Study Faculty Fellow, Eminent Scholar in Residence, 2013
- Timoshenko Lecture, Stanford University, 2012

Other Recent Professional Activities:

Consulting: N/A

Patents: N/A

Service:

Professional Development: N/A

Percentage of time committed to the program: 10
Name: Prabhakar Pagilla  Academic Rank and Title: James J. Cain ’51 Professor II

Degrees: Ph.D., Mechanical Engineering, University of California, Berkeley, 1996  
M.S., Mechanical Engineering, University of California, Berkeley, 1994  
B.E., Mechanical Engineering, Osmania University, 1990

Years of Service on Texas A&M Faculty: 4  
Professor, Texas A&M (2015-current)

Other Related Experience:  
Professor of Mechanical Engineering (2006-2015) and Centennial Professor of Engineering (Endowed, 2010-2015), Oklahoma State University  
Associate Professor, Oklahoma State University (2001-2006)  
Assistant Professor, Oklahoma State University (1996-2001)

State(s) in which registered: N/A

Undergraduate and Graduate Courses Taught:  
MEEN 651 Control Systems Design  
MEEN 652 Multivariable Control System Design  
MEEN 655 Nonlinear Control System Design  
MEEN 364 Dynamic Systems and Controls

Recent Graduate Student Advising:  
Ph.D. Students Advised:  
M.S. Students Advised:  

Five Recent Publications  

Scientific and Professional Society Memberships/Offices:  
Fellow of ASME  
Member of IEEE, SME, Pi Tau Sigma, and Sigma Xi

Recent Honors and Awards:
Regents Distinguished Research Award, Oklahoma State University, 2012
Halliburton Outstanding Faculty Award, Oklahoma State University, 2010
Halliburton Outstanding Young Faculty Award, Oklahoma State University, 2002

Other Recent Professional Activities:
Consulting: N/A

Patents:

Service:
2018 – present: Member, ABET Committee, College of Engineering
2018 - present: Chair, Educational Development Committee
2018 - present: Strategic Planning Committee
2017 - present: Member, MEEN Tenure and Promotion Committee
2017 - present: MEEN Faculty Advisory Committee
2016 - present: Member, MEEN Laboratory Committee
2016 - present: Member, ZACH Lab Committee
2016 - present: Chair, ZACH Controls Lab Subcommittee
2017 - 2018: MEEN Honors and Awards Committee
2016 - 2017: Chair, MEEN faculty search committee
2015 - 2016: Member, MEEN faculty search committee

Professional Development: N/A

Percentage of time committed to the program: 100
Name: Alan Palazzolo  
Academic Rank and Title: Professor

Degrees:  
Ph.D. Mechanical Engineering University of Virginia, 1981  
M.S. Mechanical Engineering University of Virginia, 1977  
B.S. Engineering Physics University of Toledo, 1976

Years of Service on Texas A&M Faculty: 34  
Professor (1985-Present)

Other Related Experience:
- Summer Faculty Fellow, NASA Glenn Research Center, (Summer 1986, 1987)  
- Senior Research Engineer, Southwest Research Institute, (1981-1985)  
- Research Engineer, Allis Chalmers, (1981)  
- Field Engineer, Bently Nevada Corp., (1977-1978)

State(s) in which registered:  
Registered Professional Engineer, State of Texas, Certificate No. 66111, June 12, 1989 - present

Undergraduate and Graduate Courses Taught:
- MEEN 213 Engineering Mechanics: Dynamics  
- MEEN 260 Engineering Experimentation  
- MEEN 334 Dynamics and Vibration  
- MEEN 335/364 Dynamics and Controls  
- MEEN 411 Controls  
- MEEN 431 Adv. Dynamics, Vibration and Controls  
- MEEN 441 Design of Mechanical Components and Systems  
- MEEN 459 Mechanical Vibrations  
- MEEN 221 Statics and Dynamics  
- MEEN 617 Mechanical Vibrations  
- MEEN 647 Theory of Finite Element Analysis  
- MEEN 649 Nonlinear Vibrations  
- MEEN 639 Rotordynamics  
- MEEN 654 Boundary Elements  
- MEEN 441 Design of Mechanical Components and Systems  
- MEEN 672 Intro to Finite Elements  
- ENGR 221 Statics and Particle Dynamics  
- ENGR 211 Conservation Principles (Statics and Dynamics)

Recent Graduate Student Advising:
- Ph.D. Students Advised:  
- M.S. Students Advised:  

Five Recent Publications


Scientific and Professional Society Memberships/Offices:
American Society of Mechanical Engineers
Fellow and Associate Editor for the J. of Tribology

Recent Honors and Awards:
James J. Cain Professorship I 2016
TEES Endowed Professorship 2015
TEES Senior Fellow
Director of the TAMU Vibration Control and Electromechanics Lab (VCEL)
R&D100 Award Recipient

Other Recent Professional Activities:

Consulting:
Southwest Research Institute (Simulation Piping Vibrations, 1986)
Wright Patterson Air Force Base - Lubrication Branch (1994-1995)
Goodyear, Akron, Ohio, Active Vibration Control of Engine Vibration (1994)
Accumentrics, Magnetic Bearings (2001)
DynaTech Engineering (2010)

Patents:
“Low Drag, Textured Journal Bearings”, TAMUS#4735, U.S. Provisional Patent applied for by Dr. Sheikh Ismail

Service:
Graduate Studies Coordinator (2013 –2014)
Systems and Controls Division Leader (13 faculty) (2004 - 2011)
TAMU-Qatar Promotion and Rolling Contract Committee Chair 2013, Member 2014

**Professional Development:** N/A

**Percentage of time committed to the program:** 100
Name: Michael Pate  
Academic Rank and Title: Professor

Degrees:  
Ph.D. Mechanical Engineering, Purdue University, 1982  
M.S. Mechanical Engineering, University of Arkansas, 1978  
B.S. Naval Engineering, United States Naval Academy, 1970

Years of Service on Texas A&M Faculty: 11  
Professor (2008-Present)

Other Related Experience:  
Director, Riverside Energy Efficiency Laboratory, (2008-Present)  
Associate Director, Energy Systems Laboratory, (2008-Present)  
Director, Center for Building Energy Research, Iowa State University, (2000-2008)  
Professor, Mechanical Engineering, Iowa State University, (1990-2008)  
Associate Professor, Mechanical Engineering, Iowa State University, (1987-1990)  
Assistant Professor, Mechanical Engineering, Iowa State University, (1982-1987)

State(s) in which registered: N/A

Undergraduate and Graduate Courses Taught:  
MEEN 315 Principles of Thermodynamics  
MEEN 436 Principles of Heating, Ventilating and Air Conditioning  
MEEN 437 Principles of Building Energy Analysis  
MEEN 469/669 Alternative Energy Conversion  
MEEN 421 Thermo-Fluid Analysis and Design  
MEEN 662 Energy Management in Industry

Recent Graduate Student Advising:  
Ph.D. Students Advised:  
Pangze Yang (Present), Paul Nagy (Present), Sam Meleika (Present), Vahideh Kamranzadek (Present), Guan Huang (2018), Yasuko Sakurai (2016), Wongyu Choi (2016), Adnan Ayub (2016)  
M.S. Students Advised:  

Five Recent Publications


Scientific and Professional Society Memberships/Offices:
American Society of Mechanical Engineers (1982-Present)
American Society of Heating, Refrigerating, and Air-Conditioning Engineers

Recent Honors and Awards:
ME Professor of the Year Award, ISU, 2007
ISU’s Louis Thompson Distinguished Undergraduate Teaching Award (Highest teaching award offered at ISU), University, 2006
Superior Engineering College Teacher Award, ISU, 2005
Engineer's Week Outstanding Professor Award, ISU, 2004
Outstanding Professor Award, Engineering Leadership Council 2004

Other Recent Professional Activities:
Consulting: N/A

Patents: N/A

Service:
Veterans Support Group (2014-2016)
Member, University Graduate Curriculum Committee, August 2006-August 2007
Member, Graduate Council, August 2004-August 2007

Professional Development: N/A

Percentage of time committed to the program: 100
Name: Eric L. Petersen  Academic Rank and Title: Professor

Degrees: Stanford University, Ph.D., Mechanical Engineering (1998)
University of Florida, M.S., Mechanical Engineering (1990)
University of Central Florida, B.S., Mechanical Engineering (1988)

Years of Service on Texas A&M Faculty: 12
  Director, TEES Turbomachinery Laboratory (2018-Present)
  Professor (2012-Present)
  Associate Professor (2008-2012)

Other Related Experience:
  Associate Professor, University of Central Florida, (2006-2007)
  Assistant Professor, University of Central Florida, (2001-2006)
  Lecturer, University of California, Irvine, (1998-2000)
  Research Assistant, Stanford University, (1993-1997)
  Analytical Engineer, Pratt & Whitney, (1990-1993)
  Engineer Associate, Martin Marietta, (1986-1988)

State(s) in which registered: N/A

Undergraduate and Graduate Courses Taught:
  MEEN 633 Combustion Science
  MEEN 344 Fluid Mechanics
  MEEN 404 Engineering Laboratory
  MEEN 472/605 Gas Dynamics

Recent Graduate Student Advising:
  Ph.D. Students Advised:
    James (Chris) Thomas (Present), Anibal Mornones (2018), James Thomas (2018), Travis Sikes (2018),
  M.S. Students Advised:
    Charles Keesee (Present), Joshua Hargis (Present), Clayton Hargis (Present), Catherine Dillier (Present),
    Mattias Turner (Present), Sean Cooper (Present), Cassio Brunoro Ahumada (Present), Felix Rodriguez

Five Recent Publications
     78 (1-11).
     “Aging Effects on the Burning Rates of Composite Solid Propellants with Nano-Additives,” Journal of

Scientific and Professional Society Memberships/Offices:
ASME (Fellow); AIAA (Associate Fellow); ASEE; Combustion Institute

Recent Honors and Awards:
Dean of Engineering Excellence Award, Professor Level (2019)
TEES Senior Faculty Fellow Award (2017)
The James J. Cain Graduate Teaching Award (2015)
Best Paper Award, X ISHPMIE (2014)
Nelson-Jackson Professor (2013)
TEES Fellow Award (2011)
Teaching Excellence Award (2010, 2011)
ASME Fellow (2010)
Faculty Fellow, Mary Kay O’Connor Process Safety Center (2010)
Leland T. Jordan Career Development Professorship (2010-2012)
Best Paper Award, 2008 ASME Turbo Expo (2009)
NSF CAREER Award (2006-2011)

Other Recent Professional Activities:

Consulting:
IMS Expert Services (2017 – present) Professional consultant on rocket propulsion
Parametric Solutions, Inc. (2012 – 2014) Consultant on high-pressure combustion chemistry and experimental diagnostics for combustion and reacting flows
The Aerospace Corporation. (2001-present) Consultant on matters related to rocket propulsion and experiments related to fluid mechanics, combustion, and propulsion
SATOP (Space Alliance Technology Outreach Program). (2003-2007) Served as a consultant on NASA/SATOP program projects, mostly related to fluid flow properties

Patents:

Service:
MEEN Faculty Search Committee (2017-18)
College Tenure and Promotion Committee (2017 – 2019)
Tenure and Promotion Committee, Chair (2016 – present)
Chair, Graduate Program Review Committee (2012-2018)
Graduate Studies Committee (2009 – 2015)

Professional Development: N/A

Percentage of time committed to the program: 100

227 | Page
Name: Matt Pharr  
**Academic Rank and Title:** Assistant Professor

**Degrees:**
- Ph.D. in Engineering Sciences, Harvard University, 2014
- S.M. in Engineering Sciences, Harvard University, 2010
- B.S. in Mechanical Engineering, Rice University, 2008
- B.A. in Materials Science, Rice University, 2008

**Years of Service on Texas A&M Faculty:** 2  
Assistant Professor (08/2016-present)

**Other Related Experience:**
- Postdoctoral Research Associate, University of Illinois at Urbana-Champaign (2014-2016)

**State(s) in which registered:** N/A

**Undergraduate and Graduate Courses Taught:**
- MEEN 475 Materials in Design
- MEEN 360 Materials and Manufacturing Selection in Design

**Recent Graduate Student Advising:**
- **Ph.D. Students Advised**
- **M.S. Students Advised**

**Five Recent Publications**

**Scientific and Professional Society Memberships/Offices:** N/A

**Recent Honors and Awards:**
- Kaneka Junior Faculty Award (2019)
- Peggy L. & Charles Brittan ’65 Outstanding Undergraduate Teaching Award (2019)
- Haythornthwaite Research Initiation Grant Award through ASME AMD (2017)
- National Science Foundation Graduate Research Fellowship (2013)
- Harvard University Distinction in Teaching Award (2010 & 2011)
Other Recent Professional Activities:

Consulting: N/A
Patents: N/A
Service:
Symposium chair, Soft Robotics symposium at MRS (2017)
Symposium chair, Battery Characterization Stress and Strain symposium at ECS (2019)
Organized and chaired symposium, Mechanics of Electrochemically Active Materials at SES (2019)
Review panelist for the Division of Materials Research of the National Science Foundation (2017)
Panelist, National Defense Science and Engineering Graduate Fellowship (2015)
Reviewer for Postdoctoral Scholar Travel Awards (2016)
MEEN Seminar Committee (2016 - 2017)
Mechanical Engineering Shared Services Committee (2017-2019)
Represented Texas A&M University at the Los Alamos National Lab sponsored ‘ReACt’ workshop at the Colorado School of Mines in Golden, CO (2018)
Led workshops during the Youth Adventure Program (2018, 2019)
Led workshops/lab tours for high school students through AggieSTEM (2017-2019)
Provided feedback on NSF GRFP proposals for Texas A&M students (2018)
Zachry transition ad-hoc committee (2018)
Engineering Honors Faculty (2018–present)
MEEN Educational Development Committee (2018 – present)

Professional Development: N/A

Percentage of time committed to the program: 100
Name: Andreas Polycarpou  Academic Rank and Title: Department Head and Professor

M.S. Mech. Eng., State University of New York at Buffalo (SUNY), 1992

Years of Service on Texas A&M Faculty: 7
Department Head, 2012-present
Professor, 2012 – present
Meinhard H. Kotzebue '14 Professor, 2012 – present
James J. Cain '51 Chair in Mechanical Engineering, 2016 – present

Other Related Experience:
Founding Member, Vice President, and Board Member, ATSP Innovations, 2010-present
Co-Founder/Board Member (startup), ATSP Innovations, 2010-present
Adjunct Professor, Department of Mechanical Science and Engineering, UIUC, 2012 – 2014
W. Grafton and Lillian B. Wilkins Professor, Department of Mechanical Science and Engineering, UIUC, 2011- 2012
Professor, Department of Mechanical Engineering, Khalifa University of Science, Technology and Research, 2011 – 2012
Founding Department Chair, Department of Mechanical Engineering, Khalifa University, 2011 – 2012 (while on leave from UIUC)
Associate Head for Undergraduate Programs, Department of Mechanical Science and Engineering, University of Illinois at Urbana Champaign (UIUC), 2011
Research Professor, Frederick Seitz Materials Research Laboratory, UIUC, 2009 – 2014
Professor, Department of Mechanical Science and Engineering, UIUC, 2008 – 2012
Kritzer Faculty Scholar, Department of Mechanical Science and Engineering, UIUC, 2003-2010
Associate Professor, Department of Mechanical Science and Engineering, UIUC, 2005 – 2008 (note the renaming of the department)
Visiting Associate Professor, Department of Mechanical and Manufacturing Engineering, University of Cyprus, Jun. 2005, Jul. 2006, Jan. 15 – May 31, 2008
Assistant Professor, Department of Mechanical and Industrial Engineering, University of Illinois at Urbana-Champaign (UIUC), 1999 – 2005
Staff Scientist, Seagate Technology, 1999
Senior Engineer, Seagate Technology, 1997 - 1999
Postdoctoral Fellow, Faculty of Mechanical Engineering, Technion-Israel Institute of Technology, 1995 – 1997
Visiting Lecturer, Department of Mechanical and Aerospace Engineering, State University of New York at Buffalo (SUNY), 1995
Research Associate, Department of Mechanical and Aerospace Engineering, State University of New York at Buffalo (SUNY), 1994 - 1995
Laboratory Instructor, Millard Fillmore College (Evening Division of SUNY at Buffalo), 1991 - 1992

State(s) in which registered: N/A

Undergraduate and Graduate Courses Taught:
MEEN 360 Materials and Manufacturing Selection in Design
MEEN 381 Seminar
MEEN 441 Design of Mechanical Components and Systems
MEEN 454/654 Tribology-Mechanical Interface Design
MEEN 489/689 Special Topics

Recent Graduate Student Advising:
Ph.D. Students Advised:

M.S. Students Advised:

Five Recent Publications

Scientific and Professional Society Memberships/Offices:
Fellow, American Society of Mechanical Engineers
Fellow, Society of Tribologists and Lubrication Engineers
Chair, Honors and Awards Committee, STLE, 2017-2018
Member, Honors and Awards Committee, STLE, 2011-2016
UIUC Representative for the Illinois Center for Advanced Tribology (ICAT), 2008-2012
UIUC Contact for the Information Storage Industry Consortium (INSIC), 2000-2012
Chair, Honors and Awards Committee, Tribology Division, ASME, 2013, 2014, 2015
Member, Honors and Awards Committee, Tribology Division, ASME, 2009-2013
Chair, Nominations and Oversight Committee, Tribology Division, ASME, 2011-2012

Recent Honors and Awards:
Edwin F. Church Medal, American Society of Mechanical Engineers (ASME), 2019
Mayo D. Hersey Award, American Society of Mechanical Engineers (ASME), 2018
Fellow, Society of Tribologists and Lubrication Engineers (STLE), 2013

Other Recent Professional Activities:

Consulting:
Rite-Hite Doors, Dubuque, IA, 2010-2012
Khalifa University of Science Technology and Research, 2011

Patents:

Service:
Member, TEES Centers Committee, 2017-2018
Member, Graduate Teaching Fellows Standing Committee, 2016-present
Chair, Post Tenure Review Committee, 2016-2017
Chair, Search Committee for the Civil Engineering Department Head, 2013-2014
Department Heads Council, 2012 – present
Compliance Advisory Committee, Vice Chancellor for Research, UIUC, 2009-2012 Ad Hoc Bylaws Subcommittee of the College of Engineering Executive Committee, Spring 2009-2012

**Professional Development:**
Mediator, Certified State of Texas Mediator after completing the Mediation Course, 2015

**Percentage of time committed to the program:** 100
Name: Miladin Radovic

Academic Rank and Title: Professor

Degrees: Ph.D., Materials Science and Engineering, Drexel University, 2001
M.S., Mechanical Engineering, University of Belgrade, 1997
B.S., Mechanical Engineering, University of Belgrade, 1992

Years of Service on Texas A&M Faculty: 13
Director, Material Characterization Facility, 2017 – present
Associate Department Head, Materials Science and Engineering, 2014 – 2017
Visiting Associate Professor, University of Sydney, 2013
Graduate Program Director, Materials Science and Engineering, 2013 – 2017
Associate Professor, Materials Science and Engineering, 2013 – Present
Associate Professor, Mechanical Engineering & Materials Science and Engineering Program, 2012 – Present
Assistant Professor, Mechanical Engineering & Materials Science and Engineering Program, 2006 – 2012

Other Related Experience:
Postdoctoral Fellow, Oak Ridge National Laboratory, 2001-2006
Postdoctoral Associate, Materials Engineering, Drexel University, 2001

State(s) in which registered: N/A

Undergraduate and Graduate Courses Taught:
MSEN/MEEN 222 Materials Science
MEEN 404 Engineering Laboratory
MEEN/MSEN 658 Fundamentals of Ceramics
MEEN 458 Fundamentals of Ceramics
MSEN 601 Fundamentals of Materials Science and Engineering
MEEN/MSEN 689 Fuel Cell Technologies
MSEN/MEEN 625 Mechanical Behavior of Materials
MEEN 467 Mechanical Behavior of Materials
MSEN 410 Materials Processing
MSEN 689 Materials Processing
CHEN 322 Chemical Engineering Materials
MSEN 301 Unified Materials Lab I

Recent Graduate Student Advising:
Ph.D. Students Advised:
M.S. Students Advised:

Five Recent Publications


**Scientific and Professional Society Memberships/Offices:**

ASM International, American Ceramic Society, TMS, MRS, National Institute of Ceramic Engineers, ASEE

**Recent Honors and Awards:**

2018 TEES Faculty Fellow, Texas A&M Engineering Experiment Station
2018 AZZ Faculty Fellowship, Texas A&M University
2017 NASA Glenn Research Center Faculty Fellow
2015 Dean of Engineering Excellence Award, Texas A&M University
2013 International Collaboration Award, University of Sydney, Australia
2013 Herbert H. Richardson Faculty Fellow, College of Engineering, Texas A&M University
2011 National Science Foundation, NSF, CAREER Award

**Other Recent Professional Activities:**

**Consulting:** N/A

**Patents:** N/A

**Service:**

2020 Advisory board member, 16th International Ceramics Congress, 2018 CIMTEC, 2020
2010-2020 Symposium co-organizer at 30th, 31st, 32nd, 33rd, 34th, 35th, 36th, 37th, 38th, 39th, 40th, 41st, 42nd, 43rd, 44th, and 45th International Daytona Beach Advanced Ceramics and Composites
2018 Advisory board member, 14th International Ceramics Congress, 2018 CIMTEC
2017 Symposium organizer at 12th Pacific Rim Conference on Ceramic and Glass Technology
2016 Session chair at 2016 MS&T conference
2016- present Key reader for Metallurgical and Materials Transactions
2016-present Editorial board member of Scientific Reports
2014-present Faculty co-advisor of Materials Advantage Student Chapter at Texas A&M
2014-present Editorial board member of Annals in Materials Science and Engineering
2013-2017 MSEN Associate Department Head, 2014 – 2017
2013-2017 COE Graduate Instruction Committee (GIC), member, 2013 – present
2016– present COS Graduate Instruction Committee (GIC), member, 2016 – present
Professional Development: N/A

Percentage of time committed to the program: Courtesy appointment
Name: Kumbakonam Rajagopal  Academic Rank and Title: Professor

Degrees:  Ph.D., University of Minnesota, 1978  
M.S., Illinois Institute of Technology, 1974  
B. Tech, Indian Institute of Technology, 1973

Years of Service on Texas A&M Faculty: 24  
- Regents Professor (2008-Present)  
- Forsyth Chair and Professor (1996-Present)

Other Related Experience:  
- Professor of Surgery, School of Medical and Health Sciences, University of Pittsburgh, (1994-1995)  
- Affiliate Member, School of Medical and Health Sciences, University of Pittsburgh, (1990-1995)  
- James T. MacLeod Professor of Engineering, School of Engineering, University of Pittsburgh (1990-1995)  
- Professor, Department of Mathematics & Statistics, University of Pittsburgh, (1986-1995)  
- Professor, Department of Mechanical Engineering, University of Pittsburgh, (1985-1995)  
- Associate Professor, Department of Mechanical Engineering, University of Pittsburgh, (1983-1985)  
- Assistant Professor, Department of Mechanical Engineering, University of Pittsburgh, (1982-1983)  
- Assistant Professor, Department of Mechanical Engineering, Catholic University of America, (1980-1982)  
- Postdoctoral Fellow, Macromolecular Research Center, University of Michigan, (1980)  
- Postdoctoral Lecturer, Department of Applied Mechanics & Engineering Science, University of Michigan, (1978-1980)

State(s) in which registered: N/A

Undergraduate and Graduate Courses Taught:  
- MEEN 608 Continuum Mechanics  
- MEEN 603 Elasticity  
- MEEN 489/662 Energy Management in Industry  
- MEEN 260 Mechanical Measurements  
- MEEN 638 Mechanics Nonlinear Flow

Recent Graduate Student Advising:  
- Ph.D. Students Advised:  
  - Juan Constante Gomez (2018), Gurlovleen Rathore (2017), Zhi Yuan (2017), Huan Lin (2015),  
  - Ponnalagu Alagappan (2015)

Five Recent Publications  
1. KR Rajagopal, A note on the linearization of the constitutive relations of non-linear elastic bodies, Mechanics Research Communications  

236 | Page

**Scientific and Professional Society Memberships/Offices:**
- American Society of Mechanical Engineers
- American Academy of Mechanics
- Society of Engineering Science
- American Society for Engineering Education
- Society of Rheology
- The Society for Natural Philosophy
- American Society of Civil Engineers
- International Federation of Non-Linear Analysts

**Recent Honors and Awards:**
- Honoris Causa, University of Perugia, Perugia, Italy, 2019
- Panel Member, European Research Commission, Brussels, 2018-2019
- CVET Most Cited Article Award, jointly awarded by the Biomedical Engineering Society and Springer Nature (J. Moore and J. Soares co-authors), 2016
- Identified as being in the top 3% of their discipline, using Academic Analytics standard index scoring, 2016
- President’s award for Distinguished Visitors, Ben Gurion University, Beer Sheva, 2016
- Special issues (3 issues), Mathematics and Mechanics of Solids in honor of K. R. Rajagopal’s contributions to the field of Mechanics, 2015
- TUS President’s Award, Tokyo University of Science, Tokyo, 2014
- Honoris Causa, Technical University “Gheorghe Asachi”, Iasi, 2013

**Other Recent Professional Activities:**

**Consulting:** N/A

**Patents:**

**Service:**
- Selection Committee, The Society for Natural Philosophy
- Program Committee, The Society for Natural Philosophy
- Joint AMD-MD Committee on Constitutive Equations, ASME
- Fluid Mechanics Committee, Applied Mechanics Division, ASME
- National Research Council Review Panel: Post-Doctoral Programs
- Member, Organizing Committee of the Second International Conference in Physiological Fluid Dynamics
- Member, Organizing Committee for the International Conference on Mathematical

**Professional Development:** N/A

**Percentage of time committed to the program:** 100
Name: Bryan Rasmussen

Academic Rank and Title: Professor

Degrees: Ph.D. in Mech. Eng., University of Illinois at Urbana-Champaign, 2005
M.S. in Mech. Eng., University of Illinois at Urbana-Champaign, 2002
B.S. in Mech. Eng., Utah State University, 2000, magna cum laude

Years of Service on Texas A&M Faculty: 7
   Professor (2018-current)
   Associate Professor (2012-2018)
   Assistant Professor (2006-2012)

Other Related Experience: N/A

State(s) in which registered: Registered Professional Engineer, Texas, License #110459

Undergraduate and Graduate Courses Taught:
   MEEN 260: Mechanical Measurements
   MEEN 364: Dynamic Systems and Control
   MEEN 401: Introduction to Engineering Design: Studio
   MEEN 402: Intermediate Design: Studio
   MEEN 404: Engineering Laboratory
   MEEN 406: Energy Management in Industry
   MEEN 431: Advanced Dynamics and Controls
   ENEE 489/491: Special Topics: Aggi-E Challenge
   ENEE 651: Control System Design
   ENEE 652: Multivariable Control System Design
   ENEE 662: Energy Management in Industry

Recent Graduate Student Advising:
Ph.D. Students Advised:
   Young Joon Chang (2009), Matthew Elliott (2013), Shuangshuang Liang (2014), Chao Wang (2016),
   (2021)
M.S. Students Advised:
   Abhishek Gupta (2007), Matthew Elliott (2008), Natarajkumar Hariharan (2010), Swarooph Seshadri
   Terrill (2015), Marcus Thackeray (2020),
   Deokgeun Park (2020), Rafael Dugarte Zerpa (2021)

Five Recent Publications
4. Elliott, M.S., and Rasmussen, B.P., “Decentralized Model Predictive Control of a Multi-Evaporator Air

Scientific and Professional Society Memberships/Offices:
- Tau Beta Pi, 1999
- American Society of Mechanical Engineers, 2003
- Chair, Energy Systems Technical Committee, 2014-2016
- Member, Dynamics Systems and Controls Division
- Member, Modeling, Identification and Intelligent Control Technical Committee
- Institute of Electrical and Electronics Engineers, 2003
- Member, Control Systems Society
- American Society of Heating, Refrigeration, and Air Conditioning Engineers, 2006
- Member, ASHRAE
- Corresponding Member, TC 1.4 Control Theory and Application
- Corresponding Member, TC 8.8 Refrigerant System Controls and Accessories
- American Society for Engineering Education, 2007

Recent Honors and Awards:
- Fellow, American Society of Mechanical Engineers (ASME), 2019
- Charles Crawford Distinguished Teaching Award, College of Engineering, Texas A&M University, 2019
- Holder, Leland T. Jordan Career Development Professorship, 2016-2019
- Center of Excellence Award, US Department of Energy, 2017
- James J. Cain Graduate Teaching Award, 2016
- Inaugural Best Paper Award, HVAC&R Research Journal, ASHRAE, 2013

Other Recent Professional Activities:
- Consulting: N/A
- Patents: N/A
- Service:
  - MEEN 260 Course Coordinator, 2007 – present
  - Educational Development Committee, 2011 – 2020
  - Laboratory Committee – Chair, 2014 – 2015
  - Faculty Mentoring Committee, 2014 – 2018
  - Distance Learning Committee – Chair, 2016 – 2019
  - Tenure and Promotion Committee, 2016 – 2018
  - Strategic Planning Committee, 2018 – 2019
  - Faculty Advisory Committee, 2018 – 2019
  - Scholarship Committee, 2011 – 2013
  - Undergraduate Awards Selection Committee, 2008, 2010
  - Senior Design Committee, 2013 – 2014
  - Faculty Industry Liaison Committee 2014 – 2015
  - ABET/Assessment Committee 2007 – 2008
  - Engineering Faculty Advisory Committee, Member 2018 – 2020
  - College of Engineering Honors Committee, Member, 2013 – 2014
Learning Management System Selection Sub-Committee, IT Governance Program, 2018–2019
Latter-Day Saint Student Association, Faculty Adviser, 2014–2017
Associate Editor, ASME Journal of Dynamic Systems, Measurement, and Control, 2013-2016, (19) manuscripts

**Professional Development:**
*Workshops and Seminars sponsored by the Center for Teaching Excellence, Texas A&M University*
“Pedagogy Forum: Technology-Enabled and Distance Education Programs”, 2016
“Teaching Methods and Approaches to Engage Students” Workshop, 2016
“Instructional Technology & Design” Workshop, 2015
“ePortfolio: Building Your Teaching Portfolio”, 2014
“Goodbye Dr. Chips” Faculty Professional Development Workshop, 2011
“Teaching Large Classes” seminar series, 2009
“Lecturing Well,” 2009
“Faculty Teaching Academy”, Graduate, 2007-2008
“One-Week Program in Research and Teaching for Engineering Faculty”, 2007
Personal Consultation and Classroom Evaluation, 2009
Presenter/Attendee, “International Conference on College Teaching and Learning”, 2009

**Percentage of time committed to the program:** 100
Name: Sivakumar Rathinam  
Academic Rank and Title: Associate Professor

Degrees:  
Ph.D. Civil Systems Engineering, University of California, Berkeley, 2007  
M.S. Electrical Engineering and Computer Science, University of California, Berkeley, 2006  
M.S. Mechanical Engineering, Texas A & M University, 2001  
B.Tech. Mechanical Engineering, Indian Institute of Technology, 1999

Years of Service on Texas A&M Faculty: 11  
Associate Professor (2015-current)  
Assistant Professor (2009-2015)

Other Related Experience:  
Associate Research Scientist, UARC-NASA Ames Research Center, 2007 - 2008

State(s) in which registered: N/A

Undergraduate and Graduate Courses Taught:  
MEEN 221 Statics and Particle Dynamics  
MEEN 363 Dynamics and Vibration  
MEEN 364 Dynamic Systems and Controls  
MEEN 431 Advanced System Dynamics and Controls  
MEEN 602 Modeling and Analysis of Mechanical Systems  
MEEN 651 Dynamic Systems and Controls

Recent Graduate Student Advising:  
Bingyu Wang, Abhishek Nayak, Abhay Singh, Mengke Liu, Vamsi Vegamoor, Sai Krishna Hari

Five Recent Publications  

Scientific and Professional Society Memberships/Offices:  
ASME  
IEEE

Recent Honors and Awards:  
IEEE Senior Member, 2019  
The longitudinal control team (5 undergraduate students) I supervised in the Autodrive project won the 1st place at the General Motors (GM) autonomous vehicle competition held in Arizona, 2018  
Summer Faculty Fellowship, Air Force Research Laboratory, 2015
Best paper award at the International Conference on Unmanned Aircraft Systems, 2015
Peggy L. and Charles L. Brittan ’65 Teaching Award for Outstanding Undergraduate Teaching, 2012
Morris Foster Fellowship, Texas A & M University, 2009
NASA Group Achievement Award, University Affiliated Research Center, 2009

Other Recent Professional Activities:
Consulting: N/A
Patents: N/A
Service:
Associate Editor for IEEE Transactions on Robotics and Automation, 2019-current
Associate Editor for ASME Journal of Dynamic Systems, Measurement and Control, 2019- current
Associate Editor for IEEE Conference on Intelligent Robotics Systems, 2019
Associate Editor for IEEE International Conference on Unmanned Aircraft Systems, 2015-current

Professional Development: N/A

Percentage of time committed to the program: 100
Name: J.N. Reddy  
Academic Rank and Title: Professor

Degrees:  
Ph.D., Engineering Mechanics, University of Alabama in Huntsville, 1974  
M.S., Mechanical Engineering, Oklahoma State University, 1970  
B.E. Mechanical Engineering, Osmania University, 1968

Years of Service on Texas A&M Faculty: 27  
- Regents’ Professor (2010-Present)  
- Distinguished Professor (1998-Present)  
- Oscar S. Wyatt, Jr. Chair (1992-Present)

Other Related Experience:  
- Clifton C. Garvin Professor of Engineering Science and Mechanics, Virginia Polytechnic Institute and State University, Blacksburg, Virginia, (1986-1992)  
- Professor, Engineering Science and Mechanics Department, Virginia Polytechnic Institute and State University, Blacksburg, Virginia, (1980-1985)  
- Associate Professor, School of Aerospace, Mechanical, and Nuclear Engineering, University of Oklahoma, Norman, (1978-1980)  
- Assistant Professor, School of Aerospace, Mechanical and Nuclear Engineering, University of Oklahoma, Norman, (1975-1978)  

State(s) in which registered: N/A

Undergraduate and Graduate Courses Taught:  
- MEEN 673 Nonlinear Finite Elements  
- MEEN 608 Energy andVariational Methods  
- MEEN 672 Linear Finite Elements  
- MEEN 444 An Introduction to the Finite Element Method

Recent Graduate Student Advising:  
- Ph.D. Students Advised:  

Five Recent Publications


Scientific and Professional Society Memberships/Offices:
International Advisory Committee Member, Engineering Science Programme, National University of Singapore, 2015 – present
International Advisory Board Member, SRM University, Thamilnadu, INDIA, 2009-present
Fellow, ASME, ASCE, AIAA, IACM, USACM, ASC, AAM

Recent Honors and Awards:
Member, NAE Awards Committee, The Council of the National Academy of Engineering (2019-2020 – a two-year term)
Honorary Professor, College of Engineering, Universidad Peruana de Ciencias Aplicadas, Lima, Peru, 2018-present.
2019 The Timoshenko Medal, American Society of Mechanical Engineers
The JN Reddy Medal in Mechanics of Advanced Materials and Structures, Inaugural Recipient.
The Theodore von Karman Medal, The American Society of Civil Engineers (ASCE)
Foreign Fellow, Brazilian Academy of Engineering, November 2017.
The John von Neumann Medal, The US Association of Computational Mechanics; it is the highest award given by USACM to honor individuals who have made outstanding, sustained contributions in the field of computational mechanics generally over periods representing substantial portions of their professional careers.
Inducted into the Hall of Fame of the College of Engineering, Technology, and Architecture at Oklahoma State University, 2015.
Foreign Fellow, the Indian National Academy of Engineering, September 2015.

Other Recent Professional Activities:
Consulting: N/A
Patents: N/A
Service:
Editor-in-Chief, International Journal of Structural Stability and Dynamics
Editorial Board Member, more than two dozen journals

Professional Development: N/A

Percentage of time committed to the program: 100
Name: Luis San Andres  Academic Rank and Title: Professor

Degrees: Ph.D. Mechanical Engineering, Texas A&M University, 1985
M.S. Mechanical Engineering, University of Pittsburgh, 1982
B.S. Mechanical Engineering, Summa Cum Laude, Escuela Politécnica Nacional, Ecuador, 1980

Years of Service on Texas A&M Faculty: 28
  Assistant Professor (1991-1993)
  Associate Professor (1993-2000)
  Professor (2000-current)

Other Related Experience:

State(s) in which registered:

Undergraduate and Graduate Courses Taught:
  MEEN 626 Modern Lubrication Theory, MEEN 617 Mechanical Vibrations, MEEN 613 Advanced Dynamics, MEEN 659 Sound & Vibration Measurements
  MEEN 363 Dynamics and Vibrations, MEEN 357 Engineering Analysis for MEs, MEEN 459 Sound & Vibration Measurements, MEEN 401 Design Studio,
  MEEN 334 Mechanical Systems I, ENGR 203 Modeling of Engineering Systems,
  MEEN 489 Practices of Modern Engineering,

Recent Graduate Student Advising:
  Ph.D. Students Advised:
  M.S. Students Advising/Advised:

Five Recent Publications

245 | Page
Scientific and Professional Society Memberships/Offices:
Fellow ASME, American Society of Mechanical Engineers (1987-date)
Fellow STLE, Society of Tribologists and Lubrication Engineers (1991-to date)
Member ASEE, American Society for Engineering Education

Recent Honors and Awards:
2019-2023 Mast-Childs Chair Professor (reappointment)
2019 (February – October) US Army Faculty Fellow
2018-2021, Adjunct Professor, Jiaotong University, Xi’an, PR China
2014-2019 Mast-Childs Chair Professor (inaugural appointment)
2005-2014, Mast-Childs Professorship (reappointed every three years)

Other Recent Professional Activities:

Consulting:
Listed at rotorlab.tamu.edu

Patents:

Service:
Turbomachinery Symposium Advisory Board, Member, 2013-date
International Pump Symposium Advisory Board, Member 2016-date
Asia Turbomachinery Symposium Advisory Board, Chair, 2014-16, member 2017-18
Middle Eastern Turbomachinery Symposium Advisory Board, Member, 2013-2015
Global Propulsion & Power Society (GPPS) Forum, Technical Chair, 2018 - date
Chinese International Turbomachinery Conference (CITC), Scientific Committee Member, 2017-date
Associate Editor for Tribology Transactions, Journal of Global Propulsion & Power Society.

Professional Development:
"Oil-Free Turbomachinery," Short course at Turbomachinery Symposium (September 17, 2018), 14 participants (8 hours). Taught two other times.
"Gas Bearings and Oil-Free Turbomachinery," & “Squeeze Film Dampers, Design and Operation,” Machinery Vibration and Rotordynamics Short-Course, Every January (approximately 15 students/year)

Percentage of time committed to the program: 100
Name: Srikanth Saripalli  
**Academic Rank and Title:** Associate Professor

**Degrees:**
- Ph.D., Computer Science, University of Southern California
- M.S., Computer Science, University of Southern California
- B.E., Mechanical Engineering, Birla Institute of Technology and Sciences

**Years of Service on Texas A&M Faculty:** 3
Associate Professor (2017-present)

**Other Related Experience:**
- Associate Professor, Arizona State University (2014-2016)
- Founding Head, Infosys Center for Artificial Intelligence (sabbatical) IIIT (2015)
- Assistant Professor, Arizona State University (2008-2014)
- Member of Technical Staff, Jet Propulsion Laboratory (2007-2008)
- Visiting Scholar, Universidad Politecnica (2005)

**State(s) in which registered:** N/A

**Undergraduate and Graduate Courses Taught:**
- MEEN 364 Dynamic Systems and Control
- MEEN 401 Intro to Mechanical Engineering Design

**Recent Graduate Student Advising:**
- Ph.D. Students Advised
- M.S. Students Advised

**Five Recent Publications**
2. AK Singh, KM Krishna, S Saripalli, "Planning non-holonomic stable trajectories on uneven terrain through non-linear time scaling," Autonomous Robots 40 (8), 1419-1440

**Scientific and Professional Society Memberships/Offices:**
- Senior Member Institute of Electrical and Electronics Engineers
- Member IEEE Robotics and Automation Society
- Member American Institute of Aeronautics and Astronautics
Member American Helicopter Society
Technical Member Unmanned VTOL Aircraft and Rotorcraft Committee, AHS

Recent Honors and Awards:
2013 Fellowship for Young International Scientists from Chinese Academy of Sciences
2010 design course-first prize in NASA Revolutionary Aerospace Systems Concept-Academic Linkage competition
2010 1st Prize in MoonTasks Competition
2008 NASA Group Achievement Award

Other Recent Professional Activities:
Consulting: N/A
Patents: N/A
Service:
Forum Chair, Unmanned Systems American Helicopter Society Annual Forum (2016-2018)
Program Chair, International Conference on Unmanned Aerial Systems (ICUAS 2015)
UAV Committee Member, American Helicopter Society (2013 – present)
Associate Editor, Journal for Intelligent Service Robotics (2015 – present)
Associate Editor, Journal for Intelligent and Robotics Systems (2012 – present)
Associate Editor, IEEE International Conference on Robotics and Automation (2010 – present)
Associate Editor, IEEE/RSJ International Conference on Intelligent Robots and Systems (2011 – present)
Associate Editor (2010 – 2012) for IEEE Robotics and Automation Magazine
Workshop on Robot Vision 2013, ROSE 2012
Co-Director, Center for Autonomous Vehicles and Sensor Systems (CANVASS)
Engineering Research Council Member (2017)
Society of Automotive Engineers (SAE), Faculty Advisor
Baja SAE, Faculty Advisor
Graduate Studies and Research Committee, Member (2018)
Faculty Search Committee Member, Mechanical Engineering (2017)
Professional Development: N/A

Percentage of time committed to the program: 100
Name: Meinhard Taher Schobeiri  Academic Rank and Title: Senior Professor

Degrees:  Ph.D., Technische Universität Darmstadt, Germany, 1978
          M.S., Technische Universität Darmstadt, Germany, 1970
          B.S., Technische Universität Technical University Darmstadt, Germany, 1966

Years of Service on Texas A&M Faculty: 30
  Professor (1987-Present)

Other Related Experience:
  Visiting Professor, German Technical University, Berlin, (2001- 2002)
  Visiting Professor, German Technical University, Turbomachinery Laboratory (2006, 2013)

State(s) in which registered: N/A

Undergraduate and Graduate Courses Taught:
  MEEN 603 Power Plants
  MEEN 621 Fluid Mechanics
  MEEN 622 Advanced Fluid Mechanics
  MEEN 646 Aero-Thermodynamics of Turbomachinery
  MEEN 605 Tensor Analysis for Engineers
  MEEN XXX Gas Turbine Design
  MEEN 691 Turbomachinery Flow Research
  MEEN 328 Thermodynamics II
  MEEN 344 Fluid Dynamics
  MEEN 345 Fluid Dynamics Lab
  MEEN 346 Fluid Dynamics and Heat Transfer
  MEEN 404 Fluid Dynamics Laboratory
  MEEN 414 Principles of Turbomachinery
  MEEN 421 Thermal System Design

Recent Graduate Student Advising:
  Ph.D. Students Advised:
  M.S. Students Advised:
    Tyler Rice (present), Abdulaziz Alhamoud (present), Widiatto, E. (2015)

Five Recent Publications


Scientific and Professional Society Memberships/Offices:
AIAA: American Institute of Aeronautics and Astronautics
ASME: American Society of Mechanical Engineers, Member of ASME Turbomachinery Technical Committee, Heat Transfer Committee
VDI: German Society of Mechanical Engineers.

Recent Honors and Awards:
ASME, Gas Turbine Division, Best Paper Award, 2016
Alexander von Humboldt Fellowship Award, 2013
Visiting Professorship award, Technical University Darmstadt, Germany, 2013

Other Recent Professional Activities:
Consulting:
Consulting Area: Evaluation of new Technologies developed by LVT

Patents:

Service: N/A

Professional Development: N/A

Percentage of time committed to the program: 100
Name: Marlan Scully  Academic Rank and Title: Professor

Degrees:  Ph.D., Physics, Yale University, 1966
          M.S., Physics, Yale University, 1963
          Rensselaer Polytechnic Institute, Materials Science Program, 1962
          B.S. /A.S., University of Wyoming/Casper College, 1961

Years of Service on Texas A&M Faculty: 27
           Professor (1992-1996)
           Burgess Distinguished Professor (1996-present)

Other Related Experience:
           Baylor University, Distinguished Research Academician, 2011 - date
           Princeton University Professor 2005 - 2014
           Princeton University Visiting Professor (Chemistry), 2003 - 2005
           Max-Planck-Institut für Quantenoptik Auswäriges Wissenschaftliches, 1980 - 2005
           University of New Mexico Distinguished Professor, 1980 - 1992
           University of Arizona Professor, 1969 - 1980
           Mass. Inst. of Technology Associate Professor, 1969 - 1971
           Mass. Inst. of Technology Assistant Professor, 1967 - 1969
           Yale University Instructor, 1961 - 1962

State(s) in which registered: N/A

Undergraduate and Graduate Courses Taught:
           PHYS 691-644/344/244 Research
           PHYS 685-644 Directed Studies
           MAE (Princeton) Thermodynamics, quantum optics, laser physics

Recent Graduate Student Advising:
           Current Students: Tuguldur Begzjav, Shahriar Esmaeili, Zhe He, Fu Li, Yiyun Li, Rajil Navid, Sean
                             O'Connor, Anton Shutov, Charles Wallace, Xingchen Zhao, Zachary Liege, Blake Birmingham

Five Recent Publications

Scientific and Professional Society Memberships/Offices (partial listing):
           National Academy of Sciences
           National Academy of Inventors
           American Academy of Arts and Sciences
Max Planck Society
Russian Academy of Sciences
Academia Europaea
Hungarian Academy of Sciences
Fellow, American Association for the Advancement of Science
Fellow, Optical Society of America
Fellow, American Physical Society
Fellow, Society of Photographic Instrumentation Engineers (SPIE)

Recent Honors and Awards:
Loeb Lecturer (Harvard University)
C.N. Yang Professor (Chinese University of Hong Kong)
Einstein Professor (Chinese Academy of Sciences)
Honorary Doctorate (Ulm University)
Commemorative Silver Medal (Senate of the Czech Republic)
Frederic Ives Medal/Jarus W. Quinn Endowment (OSA’s top award)
Herbert Walther Award (Deutsche Physikalische Gesellschaft/OSA)
Arthur L. Schawlow Prize (American Physical Society)
Sigma Xi Distinguished Research Award
Quantum Electronics Award (IEEE)
Charles H. Townes Award (Optical Society of America)
Elliott Cresson Medal (The Franklin Institute)
Adolph Lomb Medal (Optical Society of America)
Alexander Von Humboldt Distinguished Faculty Award
John S. Guggenheim Fellow

Other Recent Professional Activities:

Consulting (partial listing):
Los Alamos Scientific Laboratory
U.S. Air Force
Litton Industries
Rocketdyne
Rockwell International
Marin-Marietta
BDM
Dynalectric Corporation
Dayton Research Institute
La Jolla Institute
Science Applications, Inc.
U.S. Army

Patents (partial listing):
Scully, Marlan O. (Tucson, AZ)
Scully, Marlan O. (Estancia, NM)
Boyd, Robert W. (Rochester, NY), Haden, Clovis R. (College Station, TX), Scully, Marlan O. (Bryan, TX), Kocharovsky, Vitaly (College Station, TX), Belyanin, Alexey (College Station, TX)
United States Patent 6,782,020, “Infrared generation in semiconductor lasers”, August 24, 2004, Scully, Marlan O. (Bryan, TX), Belyanin, Alexey A. (College Station, TX), Kocharovsky, Vitaly V. (College Station, TX), Kocharovsky, Vladimir V. (Nizny Novgorod, RU)
United States Patent 6,795,777, “Identifying molecules of a sample”, September 21, 2004, Scully, Marlan O. (Bryan, TX), Kattawar, George W. (College Station, TX), Lucht, Robert P. (West Lafayette, IN), Opatrny, Tomas (College Station, TX), Piloff, Herschel S. (Longmont, CO), Sokolov, Alexei V. (College Station, TX), Zubairy, M. Suhail (College Station, TX)
United States Patent 8,665,923, “Remotely induced atmospheric lasing”, March 4, 2014, Sprangle; Phillip A. (Great Falls, VA), Penano; Joseph R. (Fairfax Station, VA), Scully; Marlan O. (Bryan, TX), Gordon; Daniel F. (Waldorf, MD), Hafizi; Bahman(Bethesda, MD)

Service:
- Executive Committee, College of Science, member
- Distinguished Professors Committee, Departmental (Physics), member
- Executive Engineering Chair Committee, College, member
- AMO Search Committee (Experimental & Theoretical), Dept. (Physics), member
- Trotter Prize, Steering committee, member
- HIAS Advisory Committee, TAMU, member
- Academicians Executive Committee, TAMU, Chair
- Thesis/Dissertation Committees, Departmental, various
- Served on various membership, award, and review committees as well as on advisory boards, panels, etc. in relation to my association with Member, National Academy of Science, Member, American Academy of Arts and Sciences, Member, Academia Europaea, Member, Max Planck Society, Member, Russian Academy of Sciences, Member, Hungarian Academy of Sciences, Fellow, American Physical Society (APS), Fellow, Optical Society of America (OSA), Fellow, and the American Association for the Advancement of Science (AAAS)
- Served on proposal review committees (NIH, NSF, etc.) as well as on an external departmental review committee (City University New York, Harvard University, etc.); served as reviewer on many peer reviewed journals including, e.g., PRL, PNAS, Foundations of Physics, etc.
- Director, Institute for Quantum Science and Engineering
- Director, Center for Theoretical Physics
- Associate Dean for External Relations, College of Science

Professional Development:
- Directed/organized several conferences, workshops, and symposia:
  - TAMU-PQE Follow-on Workshop (2019)
  - TAMU-Princeton-Baylor Summer School on Quantum Science and Engineering, 2019
  - AFOSR Workshop on Emerging Frontiers in Quantum-, Nano-, and Bio-Photonics, TAMU, 2019
  - HIAS – IQSE Mini-Symposium on Quantum Field Theory in Curved Space-time, TAMU, 2019
  - Material Science Symposium in honor of Prof. David Lee (2019 Physicist of the Year!), TAMU, 2019
  - Physics of Quantum Electronics (PQE) Conference, 2020
Hosted multiple speakers for the weekly AMO/QO Physics and OSA Student Chapter Seminar Series

**Percentage of time committed to the program:** Courtesy appointment
Name: Xingyong Song  Academic Rank and Title: Assistant Professor

Degrees: University of Minnesota, Twin Cities, Ph.D. Mechanical Engineering, 2011
Korea Advanced Institute of Science and Technology (South Korea), M.S. Mechanical Engineering
Harbin Institute of Technology (China), B.S. Mechanical and Mechatronics Engineering

Years of Service on Texas A&M Faculty: 4
Assistant Professor, Engineering Technology and Industrial Distribution (2015-present)

Other Related Experience:
Principal Researcher, Halliburton Research and Innovation Center (2013-2015)
Researcher, General Motors Research Center (2011-2013)

State(s) in which registered: N/A

Undergraduate and Graduate Courses Taught:
ESET 462 Control Systems
ESET 462 Laboratory
MMET 375 Applied Dynamic Systems
MXET 300 Mechatronics I

Recent Graduate Student Advising:
Ph.D. Students Advised:
Chong Ke, Dongzuo Tian, Mohammadali Kargar.
M.S. Students Advised:
Sai Sudeep Reddy

Five Recent Publications

Scientific and Professional Society Memberships/Offices:
Member: ASME
Member: IEEE
Recent Honors and Awards:
National Academy of Sciences (NAS) GRP Early Career Research Fellow Award, 2018
ACS (American Chemical Society) Doctoral Young Investigator Award, 2017
Corrie and Jim Furber ’64 Faculty Fellow, 2017
Halliburton Innovation Award, 2014
Halliburton MVP Award, 2014
Best presentation in session award by ASME DSCC Conference, 2012
Team GM Recognition Award from General Motors Global R&D, 2011
Best presentation in session award by ASME DSCC Conference, 2009

Other Recent Professional Activities:
Consulting: N/A
Patents: 23 US Patents Published
Service:
ASME DSCD Energy System Invited Session Organizing Committee, 2019, 2020 American Control Conference
Judge, for Best ASME DSCD Energy System Paper Award of 2018 American Control Conference
Serve as Search Committee Member for MXET Faculty Search in 2018 to 2019
Judge and Panelist, for Best Student Paper Award (For both Finalist and Final Awardee) of 2017 ASME Dynamic System and Controls Conference
Serve as ETID representative for College of Engineering New Common Controls Lab Development for the EEC (Engineering Education Complex) sub-committee in 2016 to 2017
Associate Editor, ASME Dynamic System and Control Division (DSC)
Associate Editor, 2016 American Control Conference
Associate Editor, 2015 ASME Dynamic System and Control Conference

Professional Development: N/A

Percentage of time committed to the program: Courtesy appointment
Name: Arun Srinivasa  
Academic Rank and Title: Professor

Degrees:  
Ph.D. University of California, Berkeley, 1991  
B. Tech Indian Institute of Technology, India 1986

Years of Service on Texas A&M Faculty: 22  
Holdredge/Paul Professor (2014-Present)  
Associate Department Head (2013-2017)  
Professor (2010-Present)  
Associate Professor (2003-2010)  
Assistant Professor (1997-2003)

Other Related Experience:  
Associate Director, Center for Computational and Applied Mechanics, University of Pittsburgh, (Fall 1994-1997)  
Assistant Professor, Department of Mechanical Engineering at the University of Pittsburgh, (1993-1994)  
Instructor, Department of Mechanical Engineering at the University of California, Berkeley, (Spring 1993-Fall 1993)  
Post-Doctoral Fellow, Department of Mechanical Engineering, University of California, Berkeley, (1991-1993)

State(s) in which registered: N/A

Undergraduate and Graduate Courses Taught:  
MEEN 467/625 Mechanical Behavior of Materials  
MEEN 404 Design of Experiments  
MEEN 225 Engineering Mechanics-Honors  
ENGR 491 Aggie Challenge

Recent Graduate Student Advising:  
Ph.D. Students Advised:  
D.R.V.S. Srinath (Expected 2018), P. West (Expected 2018), M. Abdelgawad (Expected 2018)  
M.S. Students Advised:  

Five Recent Publications  

**Scientific and Professional Society Memberships/Offices:**
- ASME, Fellow
- Society of Engineering Science, Fellow

**Recent Honors and Awards:**
- The Archie Higdon Distinguished Educator Award (2018)
- Society of Engineering Science (SES), Fellow (2017)
- American Society of Mechanical Engineers (ASME) Fellow (2016)
- 2015 Association of Former Students *College Distinguished Teaching Award.*

**Other Recent Professional Activities:**

**Consulting:** N/A

**Patents:**
- Patent Disclosure: Intelligent thermal regulation of concentrated photovoltaic system using shape memory alloys Disclosure filed in 15 Feb 2017 by (with Konstantinos Kakosimos and Jawad Sarwar)

**Service:**
- College tenure and promotion committee
- Associate Editor, Journal of Advanced Materials and Structures
- Editorial Board, International Journal of Engineering Science
- Editorial Board, International Journal of Applied Mechanics

**Professional Development:** N/A

**Percentage of time committed to the program:** 100
Name: David Staack  
Academic Rank and Title: Associate Professor

Degrees:  
Ph.D., Drexel University, 2008  
M.E., Princeton University, 2004  
B.S./M.S., University of Virginia, 2001

Years of Service on Texas A&M Faculty: 11  
Associate Professor (2015-Present)  
Director for Undergraduate Laboratory Instruction (2016-Present)  
Assistant Professor (2009-2015)

Other Related Experience: N/A

State(s) in which registered: N/A

Undergraduate and Graduate Courses Taught:  
MEEN 615 Advanced Engineering Thermodynamics  
MEEN 404 Engineering Laboratory  
MEEN 631 Microscale Thermodynamics  
MEEN 315 Principles of Thermodynamics  
MEEN 417 Basics of Plasma Engineering and Applications  
MEEN 464 Heat Transfer Laboratory  
MEEN 345 Fluid Mechanics Laboratory

Recent Graduate Student Advising:  
Ph.D. Students Advised:  
Matthew Burnette (Expected), Xin Tang (Expected), Kunpeng Wang (Expected), John Lassalle (Expected), Chris Campbell (Expected), Shariful Islam Bhuiyan (Expected), Md. Hil Baky (Expected), Min Huang (Expected), Mirza Riyaz (Expected), Robert Geiger (2017), William Pollard (2016), Peng Xiao (2015)  
M.S. Students Advised:  

Five Recent Publications
Scientific and Professional Society Memberships/Offices:
Member: AIAA, ASME, APS, IEEE

Recent Honors and Awards:
Sallie and Don Davis ’61 Career Development Professor 2017-2020
Phillips 66 First Year Faculty Fellow Award, 2016-2018
Texas A&M Engineering Excellence Award, 2015
Texas A&M Engineering Experiment Station Select Young Faculty Award, 2014
Appointment as Pioneer Natural Resources Faculty Fellow I, 2014-2017
Brittan Undergraduate Teaching Award, 2014
3M Company Non-Tenured Faculty Award, 2013, 2014, 2015

Other Recent Professional Activities:
Consulting: N/A

Patents:
Staack, David A; Geiger, Robert P; Processing of dielectric fluids with mobile charge carriers, US20130161232A1, 2016
Fridman, Gregory; Fridman, Alexander; Gutsol, Alexander F; Friedman, Gennady; Staack, David; Tubular Floating Electrode Dielectric Barrier Discharge For Applications In Sterilization and Tissue Bonding, US20120100524A1, 2016
Staack, David; Tsai, Tsung-Chan; Plasma treatment and plasma enhanced chemical vapor deposition onto temperature sensitive biological materials, US8920361B2, 2016
Staack, David; Fridman, Alexander; Gutsol, Alexander F; Gogotsi, Yury; Friedman, Gennady; Nano discharges in liquids, US20110251604A1, 2015
Fridman, Gregory; Fridman, Alexander; Gutsol, Alexander F; Friedman, Gennady; Staack, David; Hamilton, Richard J; Control of mucus membrane bleeding with cold plasma, US20090054896A1, 2013

Service:
Secretary, American Physical Society Gaseous Electronics Conference 2018-2019
Executive Committee Member (elected), American Physical Society Gaseous Electronics Conference 2016-2018

Professional Development: N/A

Percentage of time committed to the program: 100
Name: Hung-Jue Sue  Academic Rank and Title: TEES Endowed Professor

Degrees:  Ph. D. Macromolecular Science and Engineering Program, The University of Michigan, 1988  
M.S.E. Department of Mechanical Engineering, The University of Michigan, 1987  
M.S.E. Department of Materials Science and Engineering, The University of Michigan, 1985  
B.E. Department of Chemical Engineering, Chung-Yuan Christian University, 1981

Years of Service on Texas A&M Faculty: 24  
Professor (2002-Present)  
Associate Professor (1995-2002)

Other Related Experience:  
Honorary Chair Professor, Sichuan Univ., Chengdu, China (2013-2015)  
Visiting Professor, Kyushu University, Fukuoka, Japan, (2012)  
Visiting Professor, Kyoto Institute of Technology and Kaneka Corporation (2008)  
Visiting Professor, City University of Hong Kong (2001)  
Visiting Associate Professor, Hong Kong, Univ. Sci. Tech. (1999)  
Visiting Associate Professor, INSA (1997)  
Project Leader, Dow Chemical USA, (1988-1995)

State(s) in which registered: N/A

Undergraduate and Graduate Courses Taught:  
MEEN 455 Engineering with Plastics  
MSEN 634 Nano-scale Phenomena in Polymeric Systems  
MSEN 626 Polymers Laboratories

Recent Graduate Student Advising:  
Ph.D. Students Advised:  

Five Recent Publications  

Scientific and Professional Society Memberships/Offices:  
Member American Chemical Society (ACS)  
Member Materials Research Society (MRS)  
Member Society of Plastics Engineer (SPE)
Recent Honors and Awards:
Patent and Innovations of the Year Award, Office of Technology Commercialization, TAMU, 2019

Other Recent Professional Activities:

Consulting: N/A

Patents: N/A

Service:
Director of the Polymer Technology Center
Director of Consortium SCRATCH Behavior in Polymers
Co-Director of Consortium on Advancing Performance Polymers in Energy Section Applications
MSEN T&P Committee, Member, 2013-present
MSEN Admissions Committee, Member, 2011-present

Professional Development: N/A

Percentage of time committed to the program: Courtesy appointment
Name: C. Steve Suh  
**Academic Rank and Title:** Associate Professor

**Degrees:**  
Ph.D. Mechanical Engineering, Texas A&M University, 1997  
M.S. Mechanical Engineering, Auburn University, 1991  
B.S. Mechanical Engineering, Feng-Chia University, 1984

**Years of Service on Texas A&M Faculty:** 21  
Associate Professor (2004-current)  
Assistant Professor (1998-2004)

**Other Related Experience:**  
Post-Doctoral Fellow, Auburn University (1997 to 1998)

**State(s) in which registered:** N/A

**Undergraduate and Graduate Courses Taught:**  
MEEN 210 Geometric Modeling for Mechanical Design  
MEEN 368 Solid Mechanics in Mechanical Design  
MEEN 404 Engineering Laboratory  
MEEN 402 Intermediate Design  
MEEN 441 Design of Mechanical Components and Systems  
MEEN 604 Time-Frequency Nonlinear Vibration Control

**Recent Graduate Student Advising:**  
Ph.D. Students Advised:  
M.S. Students Advised:  

**Five Recent Publications**

Scientific and Professional Society Memberships/Offices:
ASME, Fellow (2019)
ASME, Member (1989)
ASEE, Member (1997)
SEM, Member (1992)
Sigma Xi, Member (1997)
ASME Technical Committee on Vibration and Sound, Member (2006-2009)
ASME AMD Division Technical Committee on Dynamics and Control of Systems and Structures, Member (2014-date)

Recent Honors and Awards:
Ford Fellow, TAMU, 2003-2004

Other Recent Professional Activities:
Consulting: N/A
Patents:

Service:
Coordinator, MEEN Engineering Honors Program
Editor-in-Chief, Journal of Vibration Testing and System Dynamics
Deputy Director, Research Institute of Dynamics and Vibration
Associate Editor, Journal of Applied Nonlinear Dynamics
Associate Editor, International Journal of Dynamics and Control

Professional Development: N/A
Percentage of time committed to the program: 100
Name: Bruce Tai  

Academic Rank and Title: Assistant Professor

Degrees:  
Ph.D., Mechanical Engineering, University of Michigan, Ann Arbor, 2011  
M.S., Applied Mechanics, National Taiwan University, 2006  
B.S., Civil Engineering, National Taiwan University, 2004

Years of Service on Texas A&M Faculty: 5  
Assistant Professor (2014-present)

Other Related Experience:  
Research Investigator of Mechanical Engineering, University of Michigan Ann Arbor, 2012-2014  
Research Investigator of Neurosurgery, University of Michigan Health System, 2012-2014

State(s) in which registered: N/A

Undergraduate and Graduate Courses Taught:  
MEEN 344 Fluid Mechanics  
MEEN 404 Engineering Laboratory (Lecture and Studio sections)  
MEEN 360 Materials and Manufacturing Selection in Design  
MEEN 453/687 Additive and Subtractive Processes in Custom Manufacturing

Recent Graduate Student Advising:  
Ph.D. Students Advised:  
M.S. Students Advised:  

Five Recent Publications

Scientific and Professional Society Memberships/Offices:  
American Society of Mechanical Engineers, member  
Society of Manufacturing Engineers, member
Recent Honors and Awards:
TEES Young Faculty Fellow Award, Texas A&M University, 2018
Outstanding Young Manufacturing Engineer Award, Society of Manufacturing Engineers, 2017
Blackall Machine Tool and Gage Award, American Society of Mechanical Engineers, 2017
Brittan Outstanding Undergraduate Teaching Award, Texas A&M Mechanical Engineering, 2017
Best paper award, ASME Manufacturing Science and Engineering Conference, 2012

Other Recent Professional Activities:
Consulting: N/A
Patents: N/A
Service:
Scientific committee of Additive Manufacturing Track in 2019 SME North American Manufacturing Research Conference
Organizing committee of 2018 North American Manufacturing Research Conference and Manufacturing Science and Engineering Conference
Scientific committee of Additive Manufacturing Track in 2018 SME NAMRC
Scientific committee of Additive Manufacturing Track in 2017 SME NAMRC
Symposium organizer of Advances in Analysis, Design, and Manufacturing of Biomedical Devices and Products in 2016 ASME MSEC at Blacksburg, Virginia.
Symposium co-organizer of Advances in Analysis, Design, and Manufacturing of Biomedical Devices and Product in 2015 ASME MSEC at Charlotte, NC
Symposium co-organizer of Advances in Analysis, Design, and Manufacturing of Biomedical Devices and Product in 2014 ASME MSEC at Detroit, MI
Multiple session chair/co-chair (2010-2018) at MSEC and NAMRC
Proposal review panelist, National Science Foundation (NSF), 2014 & 2017.
Member of MEEN faculty search committee (advanced manufacturing), 2017, 2019
Member of MEEN graduate research and studies committee, 2019 - present
Member of MEEN laboratory committee, 2016–2019
Member of MEEN strategic plan committee, 2016–2017
Member of MEEN seminar committee, 2015–2016
Judge, Mechanical Engineering Leadership Council poster competition, 2015

Professional Development: N/A

Percentage of time committed to the program: 100
Name: Joanna Tsenn  Academic Rank and Title: Instructional Assistant Professor

Degrees: Ph.D., Mechanical Engineering, Texas A&M University, 2016
        B.S., Mechanical Engineering, The University of Texas at Austin, 2010

Years of Service on Texas A&M Faculty: 3
                                        Assistant Professor of Instruction (2016-present)

Other Related Experience: N/A

State(s) in which registered: N/A

Undergraduate and Graduate Courses Taught:
  MEEN 401 Introduction to Mechanical Engineering Design
  MEEN 402 Intermediate Design

Recent Graduate Student Advising: N/A

Five Recent Publications

Scientific and Professional Society Memberships/Offices:
  Member, American Society for Engineering Education 2017 – Present
  Member, American Society of Mechanical Engineers 2006 – Present
  Vice President and Member, Pi Tau Sigma – Texas Kappa 2008 – 2010
  Secretary and Member, American Society of Mechanical Engineers at UT 2006 – 2010
  Member, Tau Beta Pi National Engineering Honor Society – Texas Alpha 2008 – 2010

Recent Honors and Awards:
  The Mechanical Engineering Industry Advisory Council Outstanding Faculty Contribution Award, 2017

Other Recent Professional Activities:
  Consulting: N/A
  Patents: N/A
  Services: N/A
  Professional Development: N/A

Percentage of time committed to the program: 100
Name: Spyros Tseregounis  Academic Rank and Title: Professor of Practice

Degrees:  B.S., Chemical Engineering, Aristotelian University of Thessaloniki, 1977
          M.S., Chemical Engineering, University of California, 1981
          Ph.D., Chemical Engineering, University of California, 1984

Years of Service on Texas A&M Faculty: >1
          Professor of Practice, Chemical Engineering (2019-present)

Other Related Experience:
          University of California Davis, Davis, CA, 2009-2019 (Senior Lecturer in College of Engineering,
          Faculty Coordinator for Corporate Relations, Associate of the Chancellor)
          University of Illinois Urbana-Champaign, Champaign, IL, 2006-2009 (Adjunct Professor in Mechanical
          Engineering, Assistant Dean in College of Engineering)
          Rolls Royce Corporation, Engineering and Technology, Indianapolis, IN, 2002-2006 (Corporate
          Specialist in Tribology)
          General Motors Research and Development Center, Warren, MI, 1984-2002 (Senior Research Engineer)

State(s) in which registered: None

Undergraduate and Graduate Courses Taught:
          Thermodynamics (ME 300, at UIUC)
          Heat Transfer (ME 320, at UIUC)
          Tribology (ME 472, at UIUC)
          Chemical Engineering Profession (ECH 80, UC Davis)
          Chemical Kinetics and Reaction Engineering (ECH 148A, UC Davis)
          Chemical Engineering Kinetics and Reactor Design Laboratory (ECH 155, UC Davis)
          Plant Design Project (ECH 158C, UC Davis)
          Statistical Methods in Design (EME 151, UC Davis)
          Professional Responsibilities of Engineers (ENG 190, UC Davis)

Recent Graduate Student Advising: N/A

Recent Publications:
   EPA FTP Vehicle Dynamometer Test in a GM Engine”, SAE Technical Paper 2002-01-1635, also in
   "Lubricant Systems, Passenger Car, and Heavy Duty Engine Lubricants" SAE SP-1710, Warrendale,
   PA (2000).
   Bardasz, E., and Cowling, S., “Engine Oil Effects on the Friction and Emissions of a Light-Duty, 2.2L
   Direct-Injection-Diesel Engine, Part 1 – Engine Test Results”, SAE Technical Paper 2002-01-2681, also
   Circular Contacts in Partial Slip ", International Journal of Mechanical Sciences, v 49, n 6, p 690-703,
   June 2007.
5. Yeo, S.-M., A. A. Polycarpou, S. I. Tseregounis, N. Tavassolian, and J.Papapolymerou,
   “Characterization and Adhesion of Interacting Surfaces in Capacitive RF MEMS Switches Undergoing

Scientific and Professional Society Memberships/Offices:
ASTM (until 2002, subcommittee chair, task forces), SAE (until 2002, task forces), AIChE, STLE, ACS.

Recent Honors and Awards:
Award of Excellence, American Society for Testing and Materials, 1999
Charles McCuen Special Achievement Award, General Motors Research and Development Center, 1993

Other Recent Professional Activities:
Consulting: N/A
Patents: N/A
Service:
Member of Grade Change Committee (2016-2019, UC Davis), Awards Committee (2016-2019, College of Engineering, UC Davis)
Professional Development: N/A

Percentage of time committed to the program: 33
Name: Jyhwen Wang  

Academic Rank and Title: Professor

Degrees: Ph. D. Mechanical Engineering, Northwestern University, 1991  
M. Eng. Manufacturing Engineering, Northwestern University, 1986  
M. S. Industrial Engineering and Operations Research, Syracuse University, 1985  
B. S. Industrial Engineering, Tunghai University, Taiwan, 1983

Years of Service on Texas A&M Faculty: 18  
Professor (2011-presents)  
Associate Professor (2007-2011)  
Assistant Professor (2001-2007)

Other Related Experience:  
Weirton Steel Corporation (1991-2001)

State(s) in which registered: N/A

Undergraduate and Graduate Courses Taught:  
ENTC 181 Manufacturing and Assembly Processes I  
ENTC 275 Mechanics for Technologists  
ENTC 361 Solid Modeling and Finite Element Analysis  
ENTC 363 Mechanical Design Applications I  
ENTC 376 Strength of Materials  
ENTC 463 Mechanical Design Applications II

Recent Graduate Student Advising:  
Ph.D. Students Advised:  
Huang, Yu-Hsuan, 2010; Zhang, Liang, 2011; Yang, Wei, 2011; Zhang, Ying, 2016; Wang, Ruoshui, 2016; Yang, Cheng-Kang, 2016; Nasim, Wahaz, current; Boonpuek, Perewat, current  
M.S. Students Advised:  
Nair, Mahesh, 2011; Feng, Zhujian, 2012; Wadja, Bright, 2014; Bai, Qiong, 2014; Su, Kuan-Yu, 2015

Five Recent Publications

Scientific and Professional Society Memberships/Offices:  
Fellow, The American Society of Mechanical Engineers (ASME)
Fellow, The Society of Manufacturing Engineers (SME)
Member, American Society for Engineering Education (ASEE)
Member, North American Deep Drawing Research Group (NADDRG)
Member, North American Manufacturing Research Institution (SME/NAMRI)

Recent Honors and Awards:
Fellow, Society of Manufacturing Engineers, elected 2015
Fellow, The American Society of Mechanical Engineers, elected 2008 • Associate Editor, Journal of Manufacturing Science and Engineering (20
Most Cited Journal of Manufacturing Processes Articles 2008 to 2013
Most Cited Articles 2005 to 2010, Journal of Materials Processing Technology
College of Engineering Faculty Fellow, Texas A&M University, 2006

Other Recent Professional Activities:
Consulting:
Sandia National Laboratories, Department of Energy, Albuquerque, New Mexico, 2004
Weirton Steel Corporation, Weirton, West Virginia, 2002
Glud and Marstrand, Losning, Denmark, 2002

Patents:

Service:
Associate Editor, ASME Journal of Manufacturing Science and Engineering (2007-2013)
Member, Editorial Board, Journal of Applied Science and Engineering Technology (2016-present)
Member, International Review Board, The International Journal of Modern Engineering (2009-present)
Member, Accreditation Committee, Society of Manufacturing Engineers (2012-present)
Member, Joint Policy Board, Auto/Steel Partnership, American Iron & Steel Institute (1999-2001)
Member, Strip Handling and Metal Processing Advisory Group, University of Pittsburgh (1999-2001)
Member, Tube Hydroforming Research Consortium, The Ohio State University (1998-2001)

Professional Development: N/A

Percentage of time committed to the program: Courtesy appointment
Name: Ya Wang

Academic Rank and Title: Associate Professor

Degrees: Ph.D., Mechanical Engineering, Virginia Polytechnic Institute and State University, 2012
M.S., Mechanical Engineering, University of Puerto Rico, 2007
B.S., Mechanical Engineering, Shandong University, 2004

Years of Service on Texas A&M Faculty: 1
Associate Professor (9/2018-present)

Other Related Experience:
Assistant Professor, Mechanical Engineering, Stony Brook University (2013 – 2018)
University of Michigan Postdoctoral Research Fellow (2012 - 2013)

State(s) in which registered: N/A

Undergraduate and Graduate Courses Taught:

Recent Graduate Student Advising:
Ph.D. Students Advised
M.S. Students Advised

Five Recent Publications
   https://doi.org/10.1109/JSEN.2019.2910105.

Scientific and Professional Society Memberships/Offices: N/A

Recent Honors and Awards:
NSF CAREER Award (2018)
U.S. Office of Naval Research Summer Faculty Fellowship (2017)
Special Congressional Recognition by Congressman Lee Zelkin (2015)
ASME SMASIS Best Student Hardware Competition (2013)

Other Recent Professional Activities:
   Consulting: N/A
   Patents:
   3 US Non-Provisional Patents Pending
   5 US Provisional Patents Pending
   Service:
   Departmental Service at Stony Brook University
   Member, Facility Program Committee 2017–2018
   Member, Undergraduate Program Committee 2014–2018
   Organizer, Department Students Poster Symposium 2016
   Host, Department Seminar MEC 696 2015
   Member/Chair, M.S. Thesis Committee (4 Students) 2014-2018
   College / University Service at Stony Brook University
   Member, CEAS Scholarship Committee 2014-2018
   External Member, M.S Thesis Committee (1 MSE) 2016
   Advanced Energy Center Lab Tour Hosting 2014-2018
   Rockwell/Anorad Equipment Donation 2013
   Professional Activities Outside University
   User Proposal Selection Committee, Center for Functional Nanomaterials in Brookhaven National Laboratory (2014-present)
   Editorial Board Member: International Journal of Mechanical Systems Engineering (2015 – present)
   Editorial Board Member: Journal of Intelligent Material Systems and Structures (2019 – present)

Professional Development: N/A

Percentage of time committed to the program: 100
Name: Sy-Bor Wen

Academic Rank and Title: Associate Professor

Degrees:
- Ph.D. Mechanical Engineering, University of California at Berkeley, CA 2006
- M.S. Mechanical Engineering, National Taiwan University, Taipei, Taiwan, 1999
- B.S. Mechanical Engineering, National Taiwan University, Taipei, Taiwan, 1997

Years of Service on Texas A&M Faculty:
- Assistant Professor (2007-2013)
- Associate Professor (2013-current)

Other Related Experience:
- Postdoctoral Fellow, Lawrence Berkeley National Laboratory (2006-2007)

State(s) in which registered: N/A

Undergraduate and Graduate Courses Taught:
- MEEN 421 Thermal Fluids Analysis and Design
- MEEN 619 Conduction and Radiation
- MEEN 461 Heat Transfer

Recent Graduate Student Advising:
- Ph.D. Students Advised:
- M.S. Students Advised:

Five Recent Publications
1. Sy-Bor Wen, Kevin Ly, "Direct numerical simulation of laser induced breakdown and the associated micro-cavitation in a bio-tissue", International Journal of Heat and Mass Transfer 131, 873-889, 2018
2. Sy-Bor Wen, Arun Bhaskar and Hongjie Zhang, “Scanning digital lithography providing high speed large area patterning with diffraction limited sub-micron resolution”, Journal of Micromechanics and Microengineering 28, 07501, 2018

Scientific and Professional Society Memberships/Offices:
- American Society of Mechanical Engineering

Recent Honors and Awards:
- NSF CAREER Award, 2009

Other Recent Professional Activities:
- Consulting: N/A
- Patents: N/A
Service:
Chair, Shared Services Committee
Member, ABET Committee
Member, Undergraduate Admissions Committee
Member, ASME K-8 and K-15 Communities

Professional Development: N/A

Percentage of time committed to the program: 100
Name: Justin Wilkerson  
**Academic Rank and Title:** Assistant Professor  

**Degrees:**  
Ph.D., Mechanical Engineering, Johns Hopkins University  
M.S.E., Mechanical Engineering, Johns Hopkins University  
B.S., Aerospace Engineering, Texas A&M University  

**Years of Service on Texas A&M Faculty:** 2  
Assistant Professor (09/2017-potent)

**Other Related Experience:**  
Harrington Faculty Fellow, University of Texas at Austin (2017 - 2018)  
Assistant Professor, University of Texas at San Antonio (2015 - 2017)  
Visiting Associate, Caltech (2015)

**State(s) in which registered:** N/A

**Undergraduate and Graduate Courses Taught:**  
MEEN 368 Solid Mechanics in Mechanical Design

**Recent Graduate Student Advising:**  
Ph.D. Students Advised  
M.S Students Advised  

**Five Recent Publications**  

**Scientific and Professional Society Memberships/Offices:**  
American Society of Mechanical Engineers (ASME)  
American Institute of Aeronautics and Astronautics (AIAA)  
American Physical Society (APS)  
Minerals, Metals, & Materials Society (TMS)  
Society of Engineering Science (SES)

**Recent Honors and Awards:**  
Donald D. Harrington Faculty Fellow, 2017
AFOSR Young Investigator Award, 2016
Ralph E. Powe Junior Faculty Award, 2015
National Science Foundation Graduate Research Fellowship, 2010
National Defense Science & Engineering Graduate Fellowship, 2009
Ammon S. Andes Award, 2009

Other Recent Professional Activities:

Consulting: N/A
Patents: N/A
Service:
Executive member of SiViRT Center, UTSA, 2015 - 2017
President of Aerospace Engineering Honor Society, 2008 - 2009
SA Science, 2016 - present
Student Advisory Board, Aerospace Engineering, Texas A&M 2007 - 2009
Conference proceedings reviews: ASME - IMECE
Proposal reviews: National Science Foundation, UTSA VPR Office, DoD SMART Program, DoD NDSEG Fellowship Program, Netherlands Organisation for Scientific Research, ACS Petroleum Research Fund
Graduate studies committee, UTSA, 2014 - 2017
Qualifying exam committee, UTSA, 2014 - 2017
Mechanical Engineering F&A committee, UTSA, 2014 - 2016
Bio-inspired materials faculty search committee, UTSA, 2015 - 2016
Oil and gas faculty search committee, UTSA, 2014 - 2015
“Multiscale Mechanics of Ductile Failure”, ASME – IMECE, 2018
“Ductile Fracture”, ASME – IMECE, 2017
Mechanics and Materials Seminar, UTSA, 2016 - 2017
Dynamic Failure, Fragmentation, and Localization, SES 2016
Mechanical Engineering Seminar, UTSA, 2015
Mechanics and Materials Seminar, Johns Hopkins University, 2011
AIAA, Texas A&M, 2006 - 2009

Professional Development: N/A

Percentage of time committed to the program: 100
Name: Lesley Wright  
Academic Rank and Title: Associate Professor

Degrees:  
Ph.D., Mechanical Engineering, Texas A&M University, 2006  
M.S., Mechanical Engineering, Texas A&M University, 2003  
B.S., Engineering with Professional Concentration in Mechanical Engineering, 2001, Arkansas State University, 2001

Years of Service on Texas A&M Faculty: 1  
Associate Professor (09/2018)

Other Related Experience:  
Xi’an Jiaotong University, Xi’an, China, Invited Scholar and Lecturer, July 2018  
Baylor University, Associate Professor, Department of Mechanical Engineering, 2014 – 2018  
Baylor University, Assistant Professor, Department of Mechanical Engineering, 2008 – 2014  
Wright-Patterson Air Force Base – Air Force Research Laboratory (AFRL), Summer Faculty Fellow (ASEE-SFFP), 2011  
The University of Arizona, Tucson, Arizona, Assistant Professor, Department of Aerospace and Mechanical Engineering, 2006 – 2008

State(s) in which registered: N/A

Undergraduate and Graduate Courses Taught:  
MEEN 345 Fluid Mechanics Laboratory (TAMU)  
MEEN 404 Engineering Laboratory (TAMU)  
MEEN 461 Heat Transfer (TAMU)  
EGR 2V97 SAE Baja Design (Baylor)  
EGR 4390 Engineering Design II (Mentored Projects, Baylor)  
ME 2345 Thermodynamics (Baylor)  
ME 2345 Thermodynamics – On-line Offering (Baylor)  
ME 3321 Fluid Mechanics (Baylor)  
ME 3345 Advanced Thermodynamics (Baylor)  
ME 4322 Computer Aided Engineering / Design (Baylor)  
ME 4335 Mechanical Engineering Laboratory (Supervised Projects, Baylor)  
ME 4336 Energy Systems Design (Baylor)  
ME 4345 Heat Transfer (Baylor)  
ME 4396 Two Phase Flow (Baylor)  
AME 413 a/b Mechanical Engineering Design (Supervised Projects, U of A)  
AME 432 Heat Transfer (U of A)  
ENGR 498 a/b Interdisciplinary Design (Supervised Projects, U of A)  
MEEN 628 Heat Transfer – Convection (TAMU)  
ME 5338 Experimental Methods in Heat Transfer and Fluid Flow (Baylor)  
ME 5341 Intermediate Heat Transfer (Baylor)  
ME 5396 Gas Turbine Heat Transfer and Cooling Technology (Baylor)  
AME 532 Convective Transport Phenomena (U of A)

Recent Graduate Student Advising:  
Ph.D. Students Advised

M.S. Students Advised

Five Recent Publications

Scientific and Professional Society Memberships/Offices:
American Society of Mechanical Engineers (ASME), Member
American Institute of Aeronautics and Astronautics (AIAA), Member
American Society of Engineering Education (ASEE), Member
Society of Automotive Engineers (SAE), Member

Recent Honors and Awards:
Society of Automotive Engineers (SAE) Ralph R. Teetor Educational Award, 2015
American Society of Mechanical Engineers (ASME) – North Texas Section, Young Engineer of the Year, 2015
American Society of Mechanical Engineers (ASME), Journal of Heat Transfer – Outstanding Reviewer, 2013
American Institute of Aeronautics and Astronautics (AIAA) Abe M. Zarem Educator Award, 2012
American Society of Engineering Educators (ASEE) – Summer Faculty Fellowship, 2011

Other Recent Professional Activities:
Consulting: N/A
Patents: N/A
Service:
ASME, K-14 Gas Turbine Heat Transfer Committee, Member (2007 – Present)
K-14, Rohsenow Award, Sub-Committee Chair (2015 – 2016)
K-14, Awards, Sub-Committee Member (2016 – 2018)
Educational Development Committee, EDC (2018 – Present)

**Professional Development:** N/A

**Percentage of time committed to the program:** 100
Name: Choongho Yu

Academic Rank and Title: Associate Professor

Degrees:
- Ph.D. Mechanical Engineering, University of Texas at Austin, 2004
- M.S. Mechanical Engineering, Korea University, Korea, 1999
- B.S. Mechanical Engineering, Korea University, Korea, 1997

Years of Service on Texas A&M Faculty: 12
- Associate Professor (2013-present)
- Assistant Professor (2007-2013)

Other Related Experience:
- Postdoctoral Fellow, University of California Berkeley, 2005-2007

State(s) in which registered: N/A

Undergraduate and Graduate Courses Taught:
- MEEN 315 Thermodynamics
- MEEN 401 Introduction to Mechanical Engineering Design
- MEEN 404 Engineering Laboratory
- MEEN 461 Heat Transfer
- MEEN 631 Microscale Thermodynamics

Recent Graduate Student Advising:

Ph.D. Students Advised:

M.S. Students Advised:

Five Recent Publications

Recent Honors and Awards:

Other Recent Professional Activities:
Consulting:
Samsung Electronics, Thermal transport in nanostructured materials

Patents:
Polymer composites with highly tunable thermal and mechanical properties and facile manufacturing methods, Choongho Yu, Hong Wang, 13260-P099WO, May 2017.

Service:
International and Nationwide
Editor, PLOS ONE
Editor, Applied Sciences
Program organizer and co-chair, ASME Power/Energy Conference
Symposium organizer and session chair, Materials Research Society (MRS) conference
Panel reviewer, Solid state materials chemistry program, National Science Foundation.
Panel reviewer, Thermal transport processes program, National Science Foundation.
Panel reviewer, Nanomanufacturing program, National Science Foundation
Tenure promotion reviewer.
Texas A&M University
Faculty Senate (2018~Current)
Aggie Fabrication Facility, Advisory Committee (2016~Current)
Aggie Challenge Project Advisor (2013~Current)
Graduate Studies and Research Committee, Mechanical Engineering (2015~Current)
Energy initiative committee, Department representative (2014)
Faculty search committee, Mechanical Engineering (2013~2014)
Korean student association, Advisor (2010~2013)
Texas A&M Nano/Micro Seminar Series, Steering committee (2009~2011)
Materials Characterization Facility, Committee for hiring staff scientists (2011)
E3 program for high school teachers, Faculty mentor (2010)
Ph.D. qualifying exam committee (Mechanical Engineering) (2008~Current)
Ph.D. qualifying exam committee (Materials science and Engineering) (2008~Current)

Professional Development: N/A
Percentage of time committed to the program: 100
Name: Byron Zambrano  Academic Rank and Title: Research Assistant Professor

Degrees: Ph.D., Mechanical Engineering, Michigan State University, 2017
         M.S., Mechanical Engineering, University of Puerto Rico at Mayaguez, 2010
         B.S. Mechanical Engineering, Escuela Superior Politecnica del Litoral, 2007

Years of Service on Texas A&M Faculty: 1
   Research Assistant Professor (2018-Present)

Other Related Experience:
   Postdoctoral Fellow, University of Wisconsin-Madison (2018)

State(s) in which registered: N/A

Undergraduate and Graduate Courses Taught:
   MEEN 315 Principles of Thermodynamics

Recent Graduate Student Advising: N/A

Five Recent Publications
   Aneurysm growth using Dynamical Gaussian Process Implicit Surface. Transactions on Biomedical
   Engineering; July 2018
   computational assessment of vascular wall mechanics and hemodynamics in pulmonary arterial
3. Gharahi H, Zambrano BA, Zhu D., DeMarco J K, Baek S Computational fluid dynamic simulation of
   human carotid artery bifurcation based on anatomy and volumetric blood flow rate measured with
   hemodynamic forces, and abdominal aortic aneurysm expansion using longitudinal CT images. Annals of
   Biomedical Engineering; May 2016

Scientific and Professional Society Memberships/Offices:
   American Heart Association (AHA)

Recent Honors and Awards:
   2016 Nominee for the Fitch H. Beach outstanding engineering award
   2015 13 US National Congress of Computational Mechanics travel award

Other Recent Professional Activities:
   Consulting: N/A
   Patents: N/A
   Service:
   Graduate student representative for the Mechanical Engineering graduate student committee
Mentor for Research experience for teacher program funded by the National Science Foundation
Coordinator for Grandparent week visit at Research Laboratories at Michigan State University

Professional Development: N/A

Percentage of time committed to the program: 100
Name: Xudong Zhang

Academic Rank and Title: Professor

Degrees: Ph.D., Industrial and Operations Engineering, University of Michigan, 1997
M.S., Industrial and Operations Engineering, University of Michigan, 1994
B.S.E., Mechanical Engineering, Tsinghua University, 1990

Years of Service on Texas A&M Faculty: 3

Other Related Experience:
Faculty Member with University of Illinois at Urbana-Champaign Mechanical & Industrial Engineering
and University of Pittsburgh Orthopaedic Surgery and Mechanical Engineering

State(s) in which registered:

Undergraduate and Graduate Courses Taught:
Human Systems Interactions
Human Factors Engineering
Biomechanics of Work
Orthopaedic Biomechanics
Occupational Biomechanics
Mechanical Measurements
Dynamics

Recent Graduate Student Advising:
Yinong Chen, Fenglong Yang, Rohith Karthikeyan (MEEN)

Five Recent Publications

Scientific and Professional Society Memberships/Offices:
ASB, HFES, IISE

Recent Honors and Awards:
Liollio Family Faculty Fellow, 2017
Keynote Speaker, World Congress of Biomechanics, 2014
Two “Best of ORS” Papers (as podium presentations at ORS and posters at AAOS), Orthopaedic Research Society (ORS) and American Academy of Orthopaedic Surgeons (AAOS) Annual Meetings, 2014
Established Investigator Award, Musculoskeletal Transplant Foundation, 2011
O’Donoghue Sports Injury Research Award (as co-recipient and co-author), American Orthopaedic Society of Sports Medicine (AOSSM), 2011

Other Recent Professional Activities:
Consulting: N/A
Patents: N/A
Service:
Academic Editor, PLOS One; Associate Editor, Human Factors; Editorial Board Member, Science China Technological Sciences
Professional Development: N/A

Percentage of time committed to the program:Courtesy appointment
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## Fall 2013 Seminar Schedule

<table>
<thead>
<tr>
<th>Speaker</th>
<th>Institution</th>
<th>Title</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dr. Ozden Ochoa</td>
<td>Army Research Laboratory Headquarters</td>
<td>Research@ARL: Discovery &amp; Innovation Pathways</td>
</tr>
<tr>
<td>Dr. William C. Schneider</td>
<td>Texas A&amp;M University</td>
<td>Space Hardware: 50 Years of Unique Lessons Learned</td>
</tr>
<tr>
<td>Dr. Hossein Haj-Hariri</td>
<td>University of Virginia</td>
<td>Hydrodynamics of Batoid Free Swimming</td>
</tr>
<tr>
<td>Dr. Alexander Sappok</td>
<td>Massachusetts Institute of Technology</td>
<td>Founding and Growing a Technology Start-Up after Graduate School: Filter Sensing Technologies Inc. and Advanced Engine Emission Controls</td>
</tr>
<tr>
<td>Dr. Luzeng Zhang</td>
<td></td>
<td>Phantom Cooling – Analysis, Design and Testing</td>
</tr>
<tr>
<td>Dr. Ibrahim Hassan</td>
<td>Texas A&amp;M University at Qatar</td>
<td>Development of MEMS Micro-Cooling Systems</td>
</tr>
<tr>
<td>Dr. Martin Böhle</td>
<td>University of Kaiserslautern, Germany</td>
<td>Theory and Application of Lattice Boltzmann Methods in Engineering Fluid Problems</td>
</tr>
<tr>
<td>Dr. Chang-Dong Yeo</td>
<td>Texas Tech University</td>
<td>Atomic Structure Change and Burnishing Wear of Thin Carbon Film during High Speed Sliding Contact</td>
</tr>
<tr>
<td>Dr. Itzhak Green</td>
<td>Georgia Institute of Technology</td>
<td>Rotordynamics, Failure Diagnosis, and Control of Rotating Machine Elements</td>
</tr>
<tr>
<td>Dr. Narayana Aluru</td>
<td>University of Illinois at Urbana-Champaign</td>
<td>Multiscale Simulation of Molecular Fluids</td>
</tr>
<tr>
<td>Dr. Pramod P. Khargonekar</td>
<td>National Science Foundation</td>
<td>Fowler Distinguished Lecture Series: Contemporary Issues in Engineering Research and Education - A View from NSF</td>
</tr>
<tr>
<td>Dr. Barry Kudrowitz</td>
<td>University of Minnesota</td>
<td>How Play and Humor Fuel Innovation</td>
</tr>
<tr>
<td>Speaker</td>
<td>Institution</td>
<td>Title</td>
</tr>
<tr>
<td>-------------------------</td>
<td>--------------------------------------------</td>
<td>-----------------------------------------------------------------------</td>
</tr>
<tr>
<td>Dr. Yuntian Zhu</td>
<td>North Carolina State University</td>
<td>Nanomaterials: Processing, Properties and Physics</td>
</tr>
<tr>
<td>Dr. Eric Petersen</td>
<td>Texas A&amp;M University</td>
<td>Reacting-Flow Studies for Propulsion, Process Safety, and Power Generation</td>
</tr>
<tr>
<td>Dr. Christopher Rhodes</td>
<td>Lynntech Inc.</td>
<td>Designing Advanced Electrochemical Nanomaterials: Interplay of Structure and Properties in Transition Metal Compounds</td>
</tr>
<tr>
<td>Dr. Jaal Ghandhi</td>
<td>University of Wisconsin - Madison</td>
<td>Opportunities in the Cylinder: High Efficiency Clean Engine Combustion</td>
</tr>
<tr>
<td>Dr. Paul Oh</td>
<td>Drexel University</td>
<td>Robotics: Passing the Tipping Point</td>
</tr>
<tr>
<td>Dr. Bonnie Dunbar</td>
<td>University of Houston</td>
<td>Exploration of Space: The Rewards and the Technical Challenges</td>
</tr>
<tr>
<td>Dr. Somnath Ghosh</td>
<td>John Hopkins University</td>
<td>Image Based Crystal Plasticity FE Models For Predicting Fatigue in Polycrystalline Metals and Alloys: Addressing the ICMSE Initiative</td>
</tr>
<tr>
<td>Dr. Satish T.S. Bukkapatnam</td>
<td>Texas A&amp;M University</td>
<td>Towards Real-time Monitoring of Ultraprecision and Nanomanufacturing Processes</td>
</tr>
<tr>
<td>Dr. Pramod P. Khargonekar</td>
<td>National Science Foundation</td>
<td>Fowler Distinguished Lecture Series</td>
</tr>
<tr>
<td></td>
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<td>Contemporary Issues in Engineering Research and Education - A View from NSF</td>
</tr>
<tr>
<td>Dr. Kyriaki Kalaitzidou</td>
<td>Georgia Institute of Technology</td>
<td>Hybrid Composites: A Light Weight Alternative to Traditional Short Glass Fiber Reinforced Polymers</td>
</tr>
<tr>
<td>Dr. M Taher Saif</td>
<td>University of Illinois at Urbana Champaign</td>
<td>Engineered Living Flegellum</td>
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<tr>
<td>Dr. K. Ravi-Chandar</td>
<td>University of Texas - Austin</td>
<td>Predictive Modelling of Failure in Ductile Materials</td>
</tr>
<tr>
<td>Dr. Ewa Bardasz</td>
<td>Lubrizol Corporation (retired)</td>
<td>Crankcase Lubricants as Enablers to Lower SI/CI Engine Exhaust Emissions</td>
</tr>
<tr>
<td>Speaker</td>
<td>Institution</td>
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<tr>
<td>Dr Tadd Truscott</td>
<td>Brigham Young University</td>
<td>Light Field Imagining and Quantitative Data Extraction</td>
</tr>
<tr>
<td>Dr. Dennis E. Anderson</td>
<td>Harvard Medical School</td>
<td>Using musculoskeletal modeling to understand vertebral fractures in older adults-progress and challenges</td>
</tr>
<tr>
<td>Dr. Karen Thole</td>
<td>Pennsylvania State University</td>
<td>Blockage Effects on Cylindrical and Shaped Film-Cooling Holes</td>
</tr>
<tr>
<td>Dr. Harry L. Swinney</td>
<td>University of Texas at Austin</td>
<td>How Competing Bacterial Colonies Can Survive by Killing Siblings</td>
</tr>
<tr>
<td>Dr. Robert Parker</td>
<td>Virginia Tech</td>
<td>Unique Cyclic Symmetry Phenomena in the Vibration of Planetary Gears</td>
</tr>
<tr>
<td>Dr. Zoltan S. Spakovszky</td>
<td>Massachusetts Institute of Technology</td>
<td>New Directions in Aero-Propulsion Research</td>
</tr>
<tr>
<td>Dr. Karl Hedrick</td>
<td>University of California - Berkeley</td>
<td>Fowler Distinguished Lecture Series</td>
</tr>
<tr>
<td>Dr. Dave Wisler</td>
<td>GERC</td>
<td>Turbomachinery Distinguished Lecture Series</td>
</tr>
<tr>
<td>Dr. Nicole Key</td>
<td>Purdue University</td>
<td>The Effects of Wake Interactions on Compressor Stage Performance</td>
</tr>
<tr>
<td>Dr. Panos Papadopoulos</td>
<td>University of California - Berkeley</td>
<td>Multiscale Modeling in Continuum Mechanics: A Connection to the Irving-Kirkwood Procedure</td>
</tr>
<tr>
<td>Dr. Peter Seiler</td>
<td>University of Minnesota</td>
<td>Control-Oriented Modeling for Wind Farms</td>
</tr>
<tr>
<td>Dr. Yevgen Barsukov</td>
<td>Texas Instruments Inc.</td>
<td>Fast Charging of Lithium-Ion Batteries: Charge control globally optimized to achieve least possible degradation</td>
</tr>
<tr>
<td>Dr. Baratunde Cola</td>
<td>Georgia Institute of Technology</td>
<td>Nanoscale Thermal Engineering from Discovery to Applications</td>
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<tr>
<td>Dr. Jamie Grunlan</td>
<td>Texas A&amp;M University</td>
<td>Multifunctional Multilayer Nanocoatings Capable of Separating Gases, Killing Bacteria and Stopping Fire</td>
</tr>
<tr>
<td>Dr. Bruce Tai</td>
<td>Texas A&amp;M University</td>
<td>Biomedical Manufacturing - Applications of Manufacturing Technologies in Healthcare</td>
</tr>
<tr>
<td>Dr. Waruna Kulatilaka</td>
<td>Texas A&amp;M University</td>
<td>Reacting Flow Diagnostics and Imaging Using Ultrashort-Pulsed Lase</td>
</tr>
<tr>
<td>Dr. Richard James</td>
<td>University of Minnesota</td>
<td>Southwest Mechanics Lecture Series: Unexpected thermodynamic properties of some exact far-from-equilibrium solutions in molecular dynamics</td>
</tr>
<tr>
<td>Dr. Christopher Williams</td>
<td>Virginia Tech</td>
<td>Designing Materials, Processes, Products, and Pedagogy for Additive Manufacturing</td>
</tr>
<tr>
<td>Dr. Kenneth E. Goodson</td>
<td>Stanford University</td>
<td>Thermal Management at the Extremes</td>
</tr>
<tr>
<td>Dr. K. Jane Grande-Allen</td>
<td>Rice University</td>
<td>Experimental Frameworks for Analysis of Heart Valve Mechanobiology</td>
</tr>
<tr>
<td>Dr. Wei Chen</td>
<td>Northwestern University</td>
<td>Design of Emerging Engineered Materials System</td>
</tr>
<tr>
<td>Dr. Judith Jeevarajan</td>
<td>Johnson Space Center</td>
<td>Discussion on NTSB findings and recommendations for Li-ion Batteries in Commercial Aircraft</td>
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<tr>
<td>Dr. Joseph J. Beaman, Jr.</td>
<td>University of Texas at Austin</td>
<td>(seminar cancelled)</td>
</tr>
<tr>
<td>Dr. John Rogers</td>
<td>University of Illinois at Urbana-Champaign</td>
<td>Fowler Distinguished Lecture Series</td>
</tr>
<tr>
<td>Dr. Patricia Davies</td>
<td>Purdue University</td>
<td>Predicting the Impact of Aircraft Noise</td>
</tr>
<tr>
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<tr>
<td>Dr. Randy L. Vander Wal</td>
<td>Penn State University</td>
<td>Carbon Nanostructure: Oxidative and Thermal Transformations</td>
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<tr>
<td>Dr. Ying Li</td>
<td>Texas A&amp;M University</td>
<td>Photocatalytic Conversion of CO2 and Water to Fuels by Sunlight</td>
</tr>
<tr>
<td>Dr. Evelyn N. Wang</td>
<td>Massachusetts Institute of Technology</td>
<td>From Nanoscale Surface Engineering to Macroscale Energy Systems</td>
</tr>
<tr>
<td>Dr. David C. Jensen</td>
<td>University of Arkansas</td>
<td>Designing Safety Into Complex Systems</td>
</tr>
<tr>
<td>Dr. Fredric F. Ehrich</td>
<td>Massachusetts Institute of Technology</td>
<td>Turbomachinery Distinguished Lecture Series: Observed Rotordynamic</td>
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<td>Phenomena in Aircraft Gas Turbine Development</td>
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<tr>
<td>Dr. Johnney B. Green, Jr.</td>
<td>Oak Ridge National Laboratory</td>
<td>Sustainable and Energy-Efficient Innovations in Buildings,</td>
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<td>Transportation and Manufacturing R&amp;D at ORNL</td>
</tr>
<tr>
<td>Dr. Caroline Clarke Hayes</td>
<td>Iowa State University</td>
<td>Hand Videos in Virtual Collaboration for Map-Based Planning</td>
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<tr>
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<tr>
<td>Dr. Kornel F. Ehmann</td>
<td>Northwestern University</td>
<td>Generation and Applications of Engineered Surface Textures</td>
</tr>
<tr>
<td>Dr. Larry A. Taber</td>
<td>Washington University in St. Louis</td>
<td>Mechanics of Early Heart and Eye Development</td>
</tr>
<tr>
<td>Dr. Per Reinhall</td>
<td>University of Washington</td>
<td>Automation in the Assembly of Aircrafts</td>
</tr>
<tr>
<td>Dr. C. Ross Ethier</td>
<td>Georgia Institute of Technology</td>
<td>Role of Biomechanics and Mechanobiology in Glaucoma</td>
</tr>
<tr>
<td>Dr. Robert W. Carpick</td>
<td>University of Pennsylvania</td>
<td>Nanoscale Factors Controlling Friction and Lubrication: From 2D</td>
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<td>Materials to Engine Oil</td>
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<tr>
<td>Dr. Harrison Hyung Min Kim</td>
<td>University of Illinois at Urbana-Champaign</td>
<td>Design Analytics for Complex Systems Optimization and Life Cycle Sustainability</td>
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<tr>
<td>Dr. Carolyn Conner Seepersad</td>
<td>University of Texas at Austin</td>
<td>Design of Energy-Absorbing Mechanical Metamaterials</td>
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<tr>
<td>Dr. Kenneth Reifsnider</td>
<td>University of Texas at Arlington</td>
<td>Mechanics of Heterogeneous Materials: Opportunities and Challenges</td>
</tr>
<tr>
<td>Dr. Ellen M. Arruda</td>
<td>University of Michigan, Ann Arbor</td>
<td>Southwest Mechanics Lecture: Anterior Cruciate Ligament and Tibiofemoral Cartilages Characterizations and Modeling, and the Role of Constitutive Model Assumptions on Whole Knee Biomechanics</td>
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<tr>
<td>Dr. Debjyoti Banerjee</td>
<td>Texas A&amp;M University</td>
<td>Nano-Devices for Enhanced Thermal Energy Storage, Cooling and Sensing</td>
</tr>
<tr>
<td>Dr. Kenneth Breuer</td>
<td>Brown University</td>
<td>Aeromechanics of Bat Flight: From Live Animals to Robotic Models</td>
</tr>
<tr>
<td>Dr. Andrew Alleyne</td>
<td>University of Illinois</td>
<td>Power Management in Complex Multi-Physics Systems</td>
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<tr>
<td>Dr. Andre Boehman</td>
<td>University of Michigan</td>
<td>Impact of Oxygenated Fuels on Soot Nanostructure and Sooting Tendency</td>
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<tr>
<td>Dr. David E. Claridge</td>
<td>Texas A&amp;M University</td>
<td>Impact and Potential of Energy Efficiency</td>
</tr>
<tr>
<td>Dr. Huajin Gao</td>
<td>Brown University</td>
<td>Fowler Distinguished Lecture Series: Mechanics as an Enabling Tool in Bioinspired Materials and Biological Interactions of Low-Dimensional Nanomaterials</td>
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<tr>
<td>Dr. Tsu-Chin Tsao</td>
<td>University of California - Los Angeles</td>
<td>Precision Motion Control: From Engine Piston Machining to Robotic Cataract Surgery</td>
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<tr>
<td>Dr. Azim Eskandarian</td>
<td>Virginia Tech</td>
<td>Controls and Signal Processing for Driver Assistance and Semi-Autonomous Driving (Partial Automation) to Enhance Safety</td>
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<tr>
<td>Dr. Marvin Doyley</td>
<td>University of Rochester</td>
<td>Ultrasound Assessment of Life-Threatening Atherosclerotic Plaques</td>
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<tr>
<td>Dr. Katharyn L. Stober</td>
<td>Texas A&amp;M University</td>
<td>How to Find (and get!) a Job</td>
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<tr>
<td>Dr. William W. Predebon</td>
<td>Michigan Technological University</td>
<td>Practice-Based Curriculum Transformation: Strategies-Tactics-Resources</td>
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<tr>
<td>Dr. Matt Pharr</td>
<td>Texas A&amp;M University</td>
<td>Lithium-Ion Batteries: Diffusion, Deformation, and Damage</td>
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<tr>
<td>Dr. Ali Erdemir</td>
<td>Argonne National Laboratory</td>
<td>What to Do About Friction and Its Adverse Impact on Sustainable</td>
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<td>Transportation Future</td>
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<tr>
<td>Dr. Alan Freed</td>
<td>Texas A&amp;M University</td>
<td>Fiber Models with Physical Parameters</td>
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<tr>
<td>Dr. James K. Guest</td>
<td>Johns Hopkins University</td>
<td>Topology Optimization for the Design of Manufacturable, High</td>
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<td>Performance ‘Structures’</td>
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<td>Dr. Richard Miles</td>
<td>Princeton University</td>
<td>Pumping Air: FLEET, Radar REMPI and Backward Lasing New Methods for</td>
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<td>Measuring Flow Properties and Contaminants in Air</td>
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<td>Dr. Frank Talke</td>
<td>University of California, San Diego</td>
<td>Fowler Distinguished Lecture Series: Mechanics and Materials</td>
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<td>Problems in Medical Device Technology and Information Storage</td>
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<tr>
<td>Dr. Seungik Baek</td>
<td>Michigan State University</td>
<td>Vascular mechanics and toward personalized medicine</td>
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<tr>
<td>Dr. Kenneth C. Hall</td>
<td>Duke University</td>
<td>Turbomachinery Distinguished Lecture Series: Nonlinear Analysis of</td>
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<td>Unsteady Flows in Multistage Turbomachines Using the Harmonic</td>
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<td>Balance Technique</td>
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<td>Bhushan, Bharat</td>
<td>Ohio State University</td>
<td>Science and Technology (S &amp; T) Policy: What is at Stake and Why</td>
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<td>Should Scientists Participate?</td>
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<tr>
<td>Dr. Joshua A. Bittle</td>
<td>University of Alabama</td>
<td>Diesel combustion modeling and high speed quantitative imaging of</td>
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<td>fuel sprays</td>
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<tr>
<td>Dr. Karen Lozano</td>
<td>University of Texas - Rio Grande Valley</td>
<td>Novel NanoSystems Developed by the Force spinning Method</td>
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<tr>
<td>Dr. Pilwon Hur</td>
<td>Texas A&amp;M University</td>
<td>Neuro/Biomechanics and its application in Robotics</td>
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<tr>
<td>Dr. Pradeep Sharma</td>
<td>University of Houston</td>
<td>Flexoelectricity</td>
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<tr>
<td>Dr. Vadim Shapiro</td>
<td>University of Wisconsin - Madison</td>
<td>Interchangeability and Interoperability in Digital Design and Manufacturing</td>
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<tr>
<td>Dr. Vinayak</td>
<td>Texas A&amp;M University</td>
<td>Spatial Design Ideation: Symbolic, Geometric, and Tangible Approaches</td>
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<tr>
<td>Dr. David L. Wood III</td>
<td>Oak Ridge National Laboratory</td>
<td>Materials Processing and Stability Challenges of Anodes and Cathodes for High-Energy-Density Lithium-Ion Batteries</td>
</tr>
<tr>
<td>Dr. Howard Stone</td>
<td>Princeton University</td>
<td>Surprising responses in common fluid flows: (i) Surface-attached bacteria, biofilms and flow and (ii) Trapping of bubbles in stagnation point flows</td>
</tr>
<tr>
<td>Dr. Damian Vogt</td>
<td>University of Stuttgart - Germany</td>
<td>Aeromechanical Phenomena in Turbomachines</td>
</tr>
<tr>
<td>Dr. Kemper E. Lewis</td>
<td>University at Buffalo, The State University of New York</td>
<td>Design Analytics: The Integration of Sensors, Data, and Machine Learning to Understand Consumer Product Usage</td>
</tr>
<tr>
<td>Dr. Michael Goldfarb</td>
<td>Vanderbilt University</td>
<td>Minimizing Physical Disability with Robotic Arms, Legs, and Exoskeletons</td>
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<tr>
<td>Dr. Michael Khonsari</td>
<td>Louisiana State University</td>
<td>Unified wear and fatigue analysis of mechanical components</td>
</tr>
<tr>
<td>Dr. M. Cynthia Hipwell</td>
<td>Buhler, Inc.</td>
<td>Fowler Distinguished Lecture Series: From Megabits to Terabits: Innovation Practices to Drive Aggressive Technology Growth</td>
</tr>
<tr>
<td>Dr. Narayana Aluru</td>
<td>University of Illinois at Urbana-Champaign</td>
<td>Southwest Mechanics Lecture Series: Nanoscale Hydrodynamics</td>
</tr>
<tr>
<td>Dr. Neil Dasgupta</td>
<td>University of Michigan</td>
<td>Interfacial Engineering of Energy Conversion and Storage Materials using Atomic Layer Deposition</td>
</tr>
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</table>
## Fall 2017 Seminar Schedule

<table>
<thead>
<tr>
<th>Speaker</th>
<th>Institution</th>
<th>Title</th>
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<tbody>
<tr>
<td>Dr. Yulia T. Peet</td>
<td>Arizona State University</td>
<td>High-Fidelity Simulations of Fluid Flows and Possibility of Bridging Them with Engineering Design</td>
</tr>
<tr>
<td>Dr. Edward C. Kinzel</td>
<td>Missouri University of Science and Technology</td>
<td>Additive Manufacturing of Optically Transparent Glass</td>
</tr>
<tr>
<td>Dr. Jacqueline O'Connor</td>
<td>Pennsylvania State University</td>
<td>Combustion Instability Mechanisms and Suppression in Gas Turbine Combustors</td>
</tr>
<tr>
<td>Dr. Thomas Edwin Beechem</td>
<td>Sandia National Laboratory</td>
<td>Defining Boundaries: Designing 2D-systems using the Materials Surrounding Them</td>
</tr>
<tr>
<td>Dr. Li Song</td>
<td>University of Oklahoma</td>
<td>Design a Systematic Data Connection Framework for Advanced Building Comfort System Diagnosis and Optimal Control</td>
</tr>
<tr>
<td>Dr. Qizhen (Katherine) Li</td>
<td>Washington State University</td>
<td>Mechanical Behavior of Porous Magnesium Based Composites</td>
</tr>
<tr>
<td>Dr. Yonggang Huang</td>
<td>Northwestern University</td>
<td>Fowler Distinguished Lecture Series: Mechanics-driven, deterministic 3D assembly</td>
</tr>
<tr>
<td>Dr. Dimitris E. Nikitopoulos</td>
<td>Louisiana State University</td>
<td>Micromodels as Table-Top Reservoir Porous Media Surrogates: Make and Measure Within</td>
</tr>
<tr>
<td>Dr. Cyrus B. Meher-Homji</td>
<td>Bechtel Corporation</td>
<td>Turbomachinery Distinguished Lecture Series: The Origins of the Turbojet Revolution</td>
</tr>
<tr>
<td>Dr. Kuruvilla John</td>
<td>University of North Texas - Denton</td>
<td>An Assessment of Air Quality Trends and Characteristics over North Texas</td>
</tr>
<tr>
<td>Dr. John G. Michopoulos</td>
<td>Naval Research Laboratory</td>
<td>Multiphysics and Data-Driven Modeling and Simulation for Naval Applications</td>
</tr>
<tr>
<td>Dr. Said Jahanmir</td>
<td>Office of Congressman Tim Ryan, OH-13</td>
<td>Intersection of Technology and Public Policy: A Personal Perspective</td>
</tr>
<tr>
<td>Dr. Anne K. Silverman</td>
<td>Colorado School of Mines</td>
<td>Low Back Biomechanics and Dynamic Balance in People with Leg Amputations</td>
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<td>Institution</td>
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<tr>
<td>Dr. Jonathan Felts</td>
<td>Texas A&amp;M University</td>
<td>Interpreting Mechanical Phenomena at Interfaces Through the Lens of Chemistry</td>
</tr>
<tr>
<td>Dr. Pamela M. Norris</td>
<td>University of Virginia</td>
<td>Engineering Thermal Transport at Interfaces: Experimental and Computational Approaches</td>
</tr>
<tr>
<td>Dr. Dorrin Jarrahbashi</td>
<td>Texas A&amp;M University</td>
<td>Liquid Jet Disintegration, Spray Formation, and Combustion: A Numerical Approach</td>
</tr>
<tr>
<td>Dr. Reza Sadr</td>
<td>Texas A&amp;M University - Qatar</td>
<td>Nanoparticles in Fluids for Engineering Applications</td>
</tr>
<tr>
<td>Dr. Selda Gunsel</td>
<td>Shell Projects &amp; Technology</td>
<td>Fowler Distinguished Lecture Series: Technology in a Changing World</td>
</tr>
<tr>
<td>Ph.D. Open Forum</td>
<td>Texas A&amp;M University</td>
<td>Ph.D. Qualifying Examination Open Forum – Study Techniques</td>
</tr>
<tr>
<td>Dr. Adolfo Delgado</td>
<td>Texas A&amp;M University</td>
<td>Development of Process Gas-Lubricated Bearings for Land-Based Turbomachinery</td>
</tr>
<tr>
<td>Dr. Dennis Assanis</td>
<td>University of Delaware</td>
<td>Fowler Distinguished Lecture Series: The Role of the Engineer in Society: My Journey</td>
</tr>
<tr>
<td>Dr. Kathryn Matlock</td>
<td>University of Illinois Urbana-Champaign</td>
<td>Manipulating Wave Propagation: Opportunities in Mechanical Metamaterials and Nondestructive Evaluation</td>
</tr>
<tr>
<td>Dr. Haleh Ardebili</td>
<td>University of Houston</td>
<td>(seminar cancelled)</td>
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<tr>
<td>Dr. Leslie M. Phinney</td>
<td>Sandia National Laboratories</td>
<td>Thermal Analysis for National Security</td>
</tr>
<tr>
<td>Dr. Kenneth T. Christensen</td>
<td>University of Notre Dame</td>
<td>Turbulent Flow Interactions with Complex Topography: From Multi-Scale Roughness to Barchan Dunes</td>
</tr>
<tr>
<td>Dr. Jennifer Gerbi</td>
<td>Advanced Research Projects Agency-Energy (ARPA-E)</td>
<td>Opportunities at ARPA-E</td>
</tr>
<tr>
<td>Speaker</td>
<td>Institution</td>
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<tr>
<td>Dr. Michael Moreno</td>
<td>Texas A&amp;M University</td>
<td>Multi-scale Biomechanics and Biomedical Engineering</td>
</tr>
<tr>
<td>Dr. Xiangli Chen</td>
<td>McKinsey &amp; Company</td>
<td>Fowler Distinguished Lecture Series: Managing Innovation in a Global Market</td>
</tr>
<tr>
<td>Dr. Ganesh Sankaranarayanan</td>
<td>Baylor University Medical Center in Dallas</td>
<td>Custom Haptic Interface Design for Surgical Simulators</td>
</tr>
<tr>
<td>Dr. Anthony M. Jacobi</td>
<td>University of Illinois at Urbana-Champaign</td>
<td>Falling-film Flows, Heat Transfer, and Potential Advances in Solar Desalination</td>
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<tr>
<td>Dr. Ashley Spear</td>
<td>University of Utah</td>
<td>A multi-scale, multi-physics modeling framework to predict spatial variation of properties in additive-manufactured metals</td>
</tr>
<tr>
<td>Dr. Haleh Ardebili</td>
<td>University of Houston</td>
<td>Next Generation Flexible and Stretchable Batteries Based on Solid Polymer Electrolytes</td>
</tr>
<tr>
<td>Dr. Diana-Andra Borca-Tasciu</td>
<td>Rensselaer Polytechnic Institute</td>
<td>Silicon-based, electrostatic harvesters for vibration energy harvesting</td>
</tr>
<tr>
<td>Dr. Carlos F. Coimbra</td>
<td>University of California San Diego</td>
<td>Hybrid Solar Forecasting Systems for Renewable Energy Integration</td>
</tr>
<tr>
<td>Dr. Kathryn (Kathy) J. Wahl</td>
<td>US Naval Research Laboratory</td>
<td>Quantitative tribocorrosion of nanocontacts to steel</td>
</tr>
<tr>
<td>Dr. Timothy Charles Lieuwen</td>
<td>Georgia Institute of Technology</td>
<td>Turbomachinery Distinguished Lecture Series: Dynamics of Premixed Flames in Unsteady Flow Fields</td>
</tr>
<tr>
<td>Dr. Robert D. Gregg</td>
<td>University of Texas at Dallas</td>
<td>From kinematic to energetic control of wearable robots for agile human locomotion</td>
</tr>
<tr>
<td>Dr. Ya Wang</td>
<td>Texas A&amp;M University</td>
<td>Optically Chopped PIR Sensor for Occupancy Detection and Localization</td>
</tr>
<tr>
<td>Dr. Kimberly Cook-Chennault</td>
<td>Rutgers School of Engineering</td>
<td>Applications for Smart Multifunctional Piezoelectric and Dielectric Materials</td>
</tr>
</tbody>
</table>
## Spring 2019 Seminar Schedule

<table>
<thead>
<tr>
<th>Speaker</th>
<th>Institution</th>
<th>Title</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dr. Bruce L. Tai</td>
<td>Texas A&amp;M University</td>
<td>3D printing of Polymers: What is new?</td>
</tr>
<tr>
<td>Dr. Richard R. Neptune</td>
<td>University of Texas at Austin</td>
<td>Biomechanical Analyses of Human Movement Aimed at Improving Rehabilitation Outcomes</td>
</tr>
<tr>
<td>Dr. Elizabeth T. Hsiao-Wecksler</td>
<td>University of Illinois at Urbana-Champaign</td>
<td>Biomechatronics to Improve Medical Training and Human Movement</td>
</tr>
<tr>
<td>Dr. A. Jeffrey Giacomin</td>
<td>Queen’s University</td>
<td>Exploiting Large-Amplitude Oscillatory Shear Flow</td>
</tr>
<tr>
<td>Dr. Mario A. Rotea</td>
<td>University of Texas at Dallas</td>
<td>Control of Wind Energy Systems</td>
</tr>
<tr>
<td>Dr. Richard Malak</td>
<td>Texas A&amp;M University</td>
<td>What should you know about research funding as a graduate student?</td>
</tr>
<tr>
<td>Dr. Leia Stirling</td>
<td>Massachusetts Institute of Technology</td>
<td>Quantifying the Qualitative: Defining and Evaluating Measures of Human Performance and Human-Machine Fluency</td>
</tr>
<tr>
<td>Dr. Raul A. Radovitzky</td>
<td>Massachusetts Institute of Technology</td>
<td>Extreme-scale simulation of complex material response</td>
</tr>
<tr>
<td>Dr. H. Alicia Kim</td>
<td>University of California, San Diego</td>
<td>Multiscale Multiphysics Topology Optimization (M2DO)</td>
</tr>
<tr>
<td>Dr. ChaBum Lee</td>
<td>Texas A&amp;M University</td>
<td>On-Machine Dimensional Measurement Technology for Health Monitoring for Precision Manufacturing Systems and Processes</td>
</tr>
<tr>
<td>Dr. Martin Byung-Guk Jun</td>
<td>Purdue University</td>
<td>Digital Twins and Data Analytics for Smart Manufacturing</td>
</tr>
<tr>
<td>Dr. Jeffrey A. Weiss</td>
<td>University of Utah</td>
<td>Probing Molecular Damage and Failure of Collagen in Connective Tissues</td>
</tr>
<tr>
<td>Dr. Dimitar Filev</td>
<td>Ford Research and Innovation Center</td>
<td>Fowler Distinguished Lecture Series: Intelligent Vehicle Systems for Smart Mobility</td>
</tr>
<tr>
<td>Speaker</td>
<td>Institution</td>
<td>Title</td>
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</tr>
<tr>
<td>Dr. Jaydev P. Desai</td>
<td>Georgia Institute of Technology</td>
<td>Flexible, 3D-printed Robotic Systems for Surgical Interventions</td>
</tr>
<tr>
<td>Dr. Larry L. Howell</td>
<td>Brigham Young University</td>
<td>Combining Origami Art and Engineering? Surprising Opportunities for Societal Impact</td>
</tr>
<tr>
<td>Dr. Andreas A. Polycarpou</td>
<td>Texas A&amp;M University</td>
<td>Fabrication and Micromechanics of Flexible Three-Dimensional Structures</td>
</tr>
<tr>
<td>Dr. Ali Erdemir</td>
<td>Argonne National Laboratory</td>
<td>Fowler Distinguished Lecture Series: Vanishing Friction: How Close Are We? – A Historical Perspective</td>
</tr>
<tr>
<td>Dr. Jeff Moore</td>
<td>Southwest Research Institute</td>
<td>Supercritical CO2 Power Cycles: How the Gas Attributed Earth’s Climate Change May Be the One that Saves it</td>
</tr>
<tr>
<td>Dr. Shoufeng Lan</td>
<td>Texas A&amp;M University</td>
<td>Metaphotonics: engineering materials for tailored nanophotonics</td>
</tr>
<tr>
<td>Dr. M. Taher A. Saif</td>
<td>University of Illinois at Urbana-Champaign</td>
<td>Living Machines</td>
</tr>
<tr>
<td>Dr. Jennifer L. Gottfried</td>
<td>U.S. Army Research Laboratory</td>
<td>Laboratory-scale experiments to predict energetic material performance</td>
</tr>
<tr>
<td>Dr. Yun Hang Hu</td>
<td>Michigan Technological University</td>
<td>Carbon Nano-Materials for Energy Application</td>
</tr>
<tr>
<td>Dr. Jacqueline H. Chen</td>
<td>Sandia National Laboratory</td>
<td>Walker Eminent Lecture Series: Towards Exascale Simulation of Turbulent Combustion in Complex Flows Relevant to Efficient Engines</td>
</tr>
<tr>
<td>Dr. Astrid Layton</td>
<td>Texas A&amp;M University</td>
<td>Using biological inspiration to improve the design of complex human-engineered networks</td>
</tr>
<tr>
<td>Dr. Samuel Graham</td>
<td>Georgia Institute of Technology</td>
<td>Engineering Interfaces to Improve Thermal Performance of Wide Bandgap</td>
</tr>
<tr>
<td>Dr. Laura Schaefer</td>
<td>Rice University</td>
<td>From Microchannels to Micropower: Modeling Sustainable Energy Systems</td>
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</table>
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The purpose of the Mechanical Engineering Ph.D. Qualifying Exam is to ensure that students pursuing a doctoral degree in mechanical engineering have a graduate-level understanding of undergraduate mechanical engineering fundamentals.

The J. Mike Walker ’66 Department of Mechanical Engineering offers a single qualifying exam covering seven fundamental mechanical engineering subject areas: Controls, Design, Dynamics, Fluid Mechanics, Heat Transfer, Solid Mechanics and Thermodynamics. The qualifying exam is a closed book, written style exam. The qualifying exam consists of two (2) problems in each subject area for a total of fourteen (14) problems.

Students select four (4) problems to answer and have a maximum of four (4) hours to complete the exam. Students are not required to attempt more than four problems. If there is any ambiguity on which four problems the student wishes to use for a grade, the four lowest scoring problems will be used to calculate the average. Students will be assigned a registration number that he/she will write on his/her exam paper. Nowhere on the exam is a student allowed to write his/her name or universal identification number (UIN).

A doctoral student whose highest conferred degree is a master’s or equivalent is allowed a maximum of two attempts to pass the exam. A doctoral student whose highest conferred degree is a bachelor’s or equivalent is allowed a maximum of three attempts to pass the exam. A master’s student whose highest conferred degree is a bachelor’s or equivalent is allowed one attempt to pass the exam.

Doctoral students are required to make their first attempt to pass the qualifying exam before they have completed 18 semester credit hours, including research hours (MEEN 691). In other words, full-time doctoral students are required to make their first attempt to pass the exam in their second long semester of study (not including summer sessions). Doctoral students are encouraged to take the qualifier earlier in their course of study if they are prepared.

The Ph.D. Qualifying Exam is administered during the first full week of the fall and spring semesters every year. Information on exam registration will be emailed to students each semester. Syllabi for the seven exam subject areas are taken from undergraduate classes in mechanical engineering at Texas A&M University.
The Ph.D. Qualifying Exam subject areas and supporting course syllabi are in the table below:

<table>
<thead>
<tr>
<th>Subject Area</th>
<th>Corresponding Courses (syllabi from previous fall used as guide)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Controls</td>
<td>MEEN 364</td>
</tr>
<tr>
<td>Design</td>
<td>MEEN 357, MEEN 401, MEEN 402</td>
</tr>
<tr>
<td>Dynamics</td>
<td>MEEN 225, MEEN 363</td>
</tr>
<tr>
<td>Fluid Mechanics</td>
<td>MEEN 344</td>
</tr>
<tr>
<td>Heat Transfer</td>
<td>MEEN 461</td>
</tr>
<tr>
<td>Solid Mechanics</td>
<td>MEEN 225, MEEN 368, CVEN 305</td>
</tr>
<tr>
<td>Thermodynamics</td>
<td>MEEN 315</td>
</tr>
</tbody>
</table>

An eight member committee chaired by the Graduate Program Director prepares the problems for the exam. The Graduate Program Qualifier Committee (GPQC) will use syllabi from the fall semester prior to the exam to select topic areas for examination problems. Students will not be given the names of the members of the exam committee responsible for writing the exam problems.

The Graduate Program Qualifiers Committee (GPQC) should follow the below exam process:

- Ask questions on topic list *(Reference UG syllabi for each subject area)*

- Avoid special topics local to their research and lab that may be interpreted as giving their students an unfair advantage. Focus on questions that are in the more core areas of the core courses. Syllabi/topic lists and copies of previous exams will be made available to the faculty exam committee upon request.

- Exam Length:
  1. Limit to 240 minute length
  2. Each subject area will consist of two problems *(exam consist of seven subject areas)*

- Thoroughly and repeatedly check the exam for typos, missing information, etc. Technical proctors will not be present in the exam room to provide clarifications.

- Include formula sheets, charts and tables, if necessary. All exams are closed-book, but formula sheets, charts and tables may be provided.

- Include exam cover page with the following:
  1. Small box for student’s examinee number
  2. Include any special testing instructions, if applicable

- Include a generous amount of extra blank pages for students to write on.

When scoring exams, the Graduate Program Qualifiers Committee (GPQC) will write comments indicating, in general, why points were removed. Justification of why each point was removed is not required or recommended. Maximum score per problem is 25% *(students are required to select four problems from the fourteen problems provided to answer)*.
A minimum score of 65% is required to pass. A student scoring below 65% fails the exam. The GPQC may choose to give a student a conditional pass for which the student must satisfy certain requirements by the end of a given period after the exam, as specified by the committee.

If a doctoral student fails the exam, they must attempt to pass the exam the next time the qualifying exam is offered within their number of attempts allowed. A doctoral student who does not pass the exam in the allowed number of attempts fails the PHD qualifying exam and will not be admitted to PHD candidacy. The student will have to take one of the following actions:

a. Switch to a master’s program in Mechanical Engineering (provided that they do not have a master’s degree in Mechanical Engineering from Texas A&M University),

b. Pursue a Ph.D. degree in another department at Texas A&M University or another institution,

c. Or, discontinue their graduate studies at Texas A&M University

Students who are suspected of academic dishonesty during the qualifying exam will be reported to the Aggie Honor System Office and undergo the adjudication process. If the student is found to be in violation of the Aggie Honor Code, appropriate sanctions will be imposed and the student will be dismissed from the Mechanical Engineering Ph.D. Program.

The MEEN Graduate Advising Office will distribute exam result letters to students.

- To comply with FERPA laws, the students will be given their exam results in a SEALED ENVELOPE
- Students must bring their student I.D. card to the MEEN Graduate Advising Office to pick up their envelope containing their exam results
- Students are not allowed to open result envelopes until they have left the MEEN Graduate Advising Office

Students who received a final score of “FAIL” for the Fall 2019 Ph.D. Qualifying Examination will be allowed to review graded exams.

- Students are required to schedule a time to view their Fall 2019 Ph.D. Qualifying Examination with a MEEN Graduate Academic Advisor
- Students will be allowed 15 minutes to review their exam in the presence of a MEEN Graduate Academic Advisor
- Students are not allowed to copy and/or photograph the exam

Students who received a final score of “FAIL” for the Fall 2019 Ph.D. Qualifying Examination will have ten business days from the date of result letter distribution to file a written appeal.
• Student appeal must be in writing

• Student appeal must include student’s name, UIN, and QE ID #

• Student appeal must clearly state topic area(s), question number(s), and detailed explanation of reason for appeal

• The MEEN Graduate Academic Advisor will submit student written appeal to Graduate Program Qualifiers Committee (GPQC) Chair for review

• The Graduate Program Qualifiers Committee (GPQC) Chair will forward final appeal decision to the MEEN Graduate Academic Advisor

• The MEEN Graduate Academic Advisor will notify student of the final appeal decision
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MEEN 601: Advanced Product Design

Catalog Description:
Design methodology, functional design, innovation, parameter analysis, design for reliability, manufacturability and strength; design project.

Course Level:  ☐ Undergraduate  ☑ Graduate

Instructional Method:  ☐ Traditional, face-to-face  ☑ Web-based

Prerequisites:  Graduate standing; MEEN 402 or equivalent

Textbook(s) and Supplemental Material:
No required text. Lecture slides, selected reading materials, and other learning tools will be distributed via eCampus.

Grading:

<table>
<thead>
<tr>
<th>Scale</th>
<th>Assessment</th>
</tr>
</thead>
<tbody>
<tr>
<td>A 90-100%</td>
<td>Homework 25%</td>
</tr>
<tr>
<td>B 80-89%</td>
<td>Design Project 75%</td>
</tr>
<tr>
<td>C 70-79%</td>
<td></td>
</tr>
<tr>
<td>D 60-69%</td>
<td></td>
</tr>
<tr>
<td>F &lt;60%</td>
<td></td>
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</tbody>
</table>

Learning Outcomes and/or Course Objectives:
1. Understand the role of a given task in the context of an overall design methodology or design process model.
2. Conduct a thorough needs analysis for a design project.
3. Create and interpret abstract representations (functional models, process models, activity diagrams) commonly used to understand a design problem.
4. Create and interpret requirements for a design project.
5. Identify design concepts or embodiments using idea generation methods.
6. Apply systematic decision methods to make design decisions (e.g., concept selection).
7. Interpret and critique proposed design methods or design process models.

Course Topics:
1. Examination of methodologies / design process models
2. Opportunity Identification & product planning
3. Formulating design objectives and requirements
4. Problem decomposition via functional modeling
5. Decision analysis
6. Non-rigorous decision methods
7. Design exploration strategies
8. Advanced design strategies
MEEN 602: Modeling and Analysis of Mechanical Systems

Catalog Description:
State spaces and vector algebra with applications to static, dynamic and controls systems, state
evolution, trajectories, ordinary differential equations; global and local balance laws and vector
calculus to describe flowing/deforming systems; steady state and transient PDEs, statics and
vibrations of strings and membranes, and the heat equation; numerical methods.

Course Level: ☑ Graduate  ☐ Undergraduate  Instructional Method: ☑ Traditional, face-to-face  ☐ Web-based

Prerequisites:  Graduate standing

Textbook(s) and Supplemental Material:
2. Serge Lang, Linear Algebra.

Grading:

<table>
<thead>
<tr>
<th>Scale</th>
<th>Assessment</th>
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<tbody>
<tr>
<td>A</td>
<td>Homework 20%</td>
</tr>
<tr>
<td>B</td>
<td>Mid-term Exam 1 25%</td>
</tr>
<tr>
<td>C</td>
<td>Mid-term Exam 2 25%</td>
</tr>
<tr>
<td>D</td>
<td>Final Exam 30%</td>
</tr>
<tr>
<td>F</td>
<td>&lt;60%</td>
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</tbody>
</table>

Learning Outcomes and/or Course Objectives:
1. Understand the fundamental nature of linear models for mechanical systems and their extensions
to nonlinear systems.
2. Derive equivalent minimization based approaches for the modeling of mechanical systems.
3. Learn the numerical solution to general governing equations for modeling mechanical systems.

Course Topics:
1. Geometry of linear systems, Gaussian elimination, LU decomposition
2. Vector spaces and subspaces
3. Linear independence, span, basis of a subspace
4. Linear transformations
5. Orthogonal subspaces
6. Least squares projection, Gram-Schmidt, and QR factorizations
7. Eigenvalue problems
8. Difference equations, differential equations
9. Conditions for critical points, positive definite matrices
10. Geometry of minimization, generalized eigenvalue problems, energy minimization
11. Graphs and networks, fundamental equations of equilibrium
12. Structures in equilibrium
13. Analysis of continuous linear systems
14. Differential equations of
15. equilibrium, calculus of variations, weak form
MEEN 603: Theory of Elasticity

Catalog Description:
Analysis of stress and strain in two and three dimensions, equilibrium and compatibility equations, strain energy methods; torsion of noncircular sections; flexure; axially symmetric problems.

Course Level: □ Undergraduate ☒ Graduate Instructional Method: ☒ Traditional, face-to-face □ Web-based

Prerequisites: Graduate standing

Textbook(s) and Supplemental Material
1. Elasticity by Atkin and Fox.
2. Theory of Elasticity by Tiomshenko and Goodier
3. Mathematical Theory of Elasticity by Sokolnikoff
4. Deformations of Elastic Solids by Mal and Singh
5. Elasticity by Reismann and Pawlik

Grading:

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<tr>
<th>Scale</th>
<th>Assessment</th>
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<tbody>
<tr>
<td>A 90-100%</td>
<td>Exams 50%</td>
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<td>C 70-79%</td>
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<td>D 60-69%</td>
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<tr>
<td>F &lt;60%</td>
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</table>

Learning Outcomes and/or Course Objectives:
The aim of this course is to provide the student with a thorough grounding of the concepts of linearized elasticity and its application to a variety of problems of engineering interest. In particular, the course will highlight the applicability and limitations of the theory and will teach the use of a variety of formulations and solution techniques.

The student will demonstrate their understanding of and proficiency in the subject by being able to:
1. Make a judicious evaluation as to whether the linearized theory is applicable to a particular situation
2. Make the necessary idealizations in the geometry and applied loading.
3. Decompose the problem into a suitable number of parts for which the solution can be obtained more easily.
4. Classify problems into various types and use techniques suitable to each of them.
5. Get physically reasonable, rough estimate of the solution using a suitable approximation scheme.

Course Topics:
1. Introductory material
2. Kinematics linearized strain
3. Compatibility condition
4. Constitutive relations for a linearized elastic solid
5. Governing equations
6. Anti-plane strain problems
7. Plane-strain problems
8. Plane-stress and generalized plane stress problems
9. Problems in polar coordinates
10. Pressure vessels
11. Torsion
12. Infinite plate with a hole
13. Infinite plate with an inclusion
14. Cracks
15. Revision
MEEN 604: Time-Frequency Nonlinear Vibration Control

Catalog Description:
Deployment of simultaneous vibration and frequency control in real-time to efficiently negate nonlinear dynamic instability; nonlinear vibrations in the join time-frequency domain; theories on incorporating nonlinear dynamics and nonlinear time-frequency control into the control of bifurcation and route-to-chaos; integration on basic and advance topics from several engineering disciplines into the creation of an innovative, new control theory effective in denying bifurcation and chaotic state from emerging.

Course Level: ☒ Graduate

Instructional Method: ☒ Traditional, face-to-face

Prerequisites: Graduate standing

Textbook(s) and Supplemental Material:

Grading:

<table>
<thead>
<tr>
<th>Scale</th>
<th>Assessment</th>
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<tbody>
<tr>
<td>A</td>
<td>90-100%</td>
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<tr>
<td>B</td>
<td>80-89%</td>
</tr>
<tr>
<td>C</td>
<td>70-79%</td>
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<tr>
<td>D</td>
<td>60-69%</td>
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<tr>
<td>F</td>
<td>&lt;60%</td>
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</table>

Learning Outcomes and/or Course Objectives:
1. Formulate a control methodology that mitigates instability and enables robust controller design.
2. Derive concepts viable for the stipulation of instability control and system identification and signal processing
3. Develop substantial knowledge along with computer tools through example problems on high-speed micromachining control and synchronization of chaos, among others.
4. Formulate time-frequency control scheme for specific engineering problems that are transient, aperiodic, and broadband in nature.

Course Topics:
1. Analog signals, Basis, Vectors, Projection, Vector Spaces
2. Integral Transform: Fourier Analysis
3. Sampling, Sampling Theorem, Discrete-Time Signals
4. Nonlinear Dynamics
5. Nonlinear Non-Stationary Signals
6. Discrete Fourier Transform, Short-Time Fourier Transform, Gabor Transform
7. Time-Frequency Analysis: Wavelets, Filters and Filterbanks
8. Time-Frequency Analysis: Instantaneous Frequency
9. Time-Frequency Control Theory
10. High Speed Time-Frequency Cutting Control
11. Synchronization of Chaos
MEEN 605: Gas Dynamics

Catalog Description:
Overview of gas flows at Mach numbers wherein the fluid can no longer be assumed incompressible; aerospace and mechanical engineering applications ranging from external aerodynamics to internal flows for applications such as propulsion and airframe designs for jets, rockets, missiles and other devices; includes supersonic flows, shock waves, expansion waves, shock tubes, supersonic wind tunnels, gas flows with friction and gas flows with heat transfer.

Course Level: ☐ Undergraduate ☐ Graduate ☒ Graduate  
Instructional Method: ☒ Traditional, face-to-face ☐ Web-based

Prerequisites: Graduate standing; MEEN 344 or equivalent

Textbook(s) and Supplemental Material:

Grading:

<table>
<thead>
<tr>
<th>Scale</th>
<th>Assessment</th>
</tr>
</thead>
<tbody>
<tr>
<td>A 90-100%</td>
<td>Exams (3 total) 85%</td>
</tr>
<tr>
<td>B 80-89%</td>
<td>Homework 15%</td>
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<td>C 70-79%</td>
<td></td>
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<tr>
<td>D 60-69%</td>
<td></td>
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<tr>
<td>F &lt;60%</td>
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</table>

Learning Outcomes and/or Course Objectives:
1. understand basic relations of fluid mechanics and thermodynamics (continuity, momentum, energy, 2nd Law of Thermodynamics) from a control volume standpoint
2. evaluate sound speeds of ideal gases and calculate Mach numbers
3. analyze the flow in nozzles, diffusers, and from pressurized vessels
4. understand the fundamentals of shock tubes
5. evaluate the pressure and Mach number changes through an expansion fan

Course Topics:
1. Momentum equation; 2nd Law of Thermodynamics; wave propagation in elastic media; Mach number; subsonic and supersonic flows
2. Isentropic flow of a perfect gas; varying area channels; stagnation properties; choked flow
3. Converging-diverging nozzles and diffusers; applications
4. Normal shock waves; governing equations for a stationary normal shock wave
5. Shock waves in a C-D nozzle; supersonic wind tunnels
6. Shock tubes
7. Gradual compressions and expansions; Prandtl-Meyer expansion fans; Prandtl-Meyer flow for a smooth compression
8. Fanno flow line; relations of Fanno flow; 1-D flow problems with friction
9. Supersonic oblique-shock diffuser; exit flow for supersonic nozzles; supersonic airfoils
MEEN 606: Polymer Laboratories

Catalog Description:
This course covers basic experimental methods in polymer science. Broad Spectra of experiments are planned, dealing with synthesis, characterization and structure/property relationship.

Course Level:  □ Undergraduate  ☒ Graduate

Instructional Method:  □ Web-based  ☒ Traditional, face-to-face

Prerequisites:  Graduate standing

Textbook(s) and Supplemental Material:
2. Polymer: Polymer Characterization and Analysis: Jacqueline L. Kroschwitz (editor)
3. Instrumental Methods of Analysis: Hobart H. Willard, Lynne L. Merritt, Jr. and John A. Dean
4. Physical Properties of Polymers Handbook: James E. Mark

Grading:

<table>
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<tr>
<th>Scale</th>
<th>Assessment</th>
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<tbody>
<tr>
<td>A 80 and above</td>
<td>Homework 20%</td>
</tr>
<tr>
<td>B 65-80</td>
<td>Mid-term Exam 1 25%</td>
</tr>
<tr>
<td>C 50-65</td>
<td>Mid-term Exam 2 25%</td>
</tr>
<tr>
<td>F 50 and below</td>
<td>Final Exam 30%</td>
</tr>
</tbody>
</table>

Learning Outcomes and/or Course Objectives:
To prepare students who are interested in polymer research with necessary experimental skills to conduct & analyze experimental work.

Course Topics:
1. Polymerization of Styrene
2. Curing of epoxy
3. Rubber swelling
4. Thermal Gravitational Analyzer
5. Density Measurements
6. Surface Roughness Measurements
7. Dynamic Mechanical Analysis
8. Fracture Toughness
9. Fourier Transform Infrared Spectroscopy
10. DSC
MEEN 607: Polymer Physical Properties

Catalog Description:
Macromolecular concepts; molecular weight characterization; solubility parameters; phase diagrams; viscoelasticity; rheology; thermal behavior; damage phenomena, morphology; crystallization; liquid crystallinity; nanocomposites.

Course Level: ☒ Graduate  ☐ Undergraduate  Instructional Method: ☒ Traditional, face-to-face  ☐ Web-based

Prerequisites:  Graduate standing; MEEN 222 or equivalent

Textbook(s) and Supplemental Material:

Grading:

<table>
<thead>
<tr>
<th>Scale</th>
<th>Assessment</th>
</tr>
</thead>
<tbody>
<tr>
<td>(out of 1000 points)</td>
<td></td>
</tr>
<tr>
<td>A ≥ 900 points</td>
<td>Homework 15%</td>
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<td>Cumulative Exam 35%</td>
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Learning Outcomes and/or Course Objectives:
1. Define basic terminology and comprehend mathematics associated with physical polymer science. For example, you should be able to name or draw the chemical structure of common polymers, as well as know the basic properties of these polymers (e.g., glass transition temperature). Given appropriate information, you should be able to calculate various molecular weight averages and use those averages to determine what broad type of polymer it is.
2. Develop appreciation of polymer structure-property relationships. For example, you should be able to estimate whether a polymer is glassy or rubbery at room temperature by looking at the chemical structure.
3. Learn the inner workings of various characterization techniques and how they are able to provide information about polymer structure and physical properties. You should be able to choose the best tool (or technique) to measure a given property (modulus, glass transition temperature, etc.) of a specific polymer.
Course Topics:
1. Introduction to Polymers
2. Chain Structure and Classifications
3. Molecular Weight
4. Polymer-Solvent Thermodynamics
5. Polymer Chain Conformation
6. Radius of Gyration
7. Light Scattering
8. Intrinsic Viscosity
9. Glass Transition
10. Phase Behavior & Polymer Blends
11. Crystallinity
12. Rubber Elasticity
13. Viscoelasticity
14. Rheology
15. Rheometry
16. Mechanical Behavior
MEEN 608: Theory of Elasticity

Catalog Description:
Analysis of stress and strain in two and three dimensions, equilibrium and compatibility equations, strain energy methods; torsion of noncircular sections; flexure; axially symmetric problems.

Course Level: 🆒 Graduate

Instructional Method: 🆒 Traditional, face-to-face

Prerequisites: Graduate standing

Textbook(s) and Supplemental Material
9. Continuum Mechanics: P. Chadwick
11. A first course in Rational Mechanics: C. Truesdell
12. Classical Field Theories of Mechanics: C. Truesdell and R. Toupin
13. Non-linear Field Theories of Mechanics: C. Truesdell and W. Noll

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| Mid-term Exam | 40% |
| Final Exam    | 60% |

Learning Outcomes and/or Course Objectives:
The aim of this course is to provide the student the means to understand the underpinnings of continuum mechanics as it pertains to both fluids and solids. An introduction will be provided to kinematics, basic balance equations, concepts of frame-indifference and material symmetry, and elementary constitutive theory for continua.

The student will learn the basic mechanics of continua and build upon this to study more specialized theories in solid and fluid mechanics such as non-linear elasticity, viscoelasticity, non-linear fluid mechanics, mixture theory, plasticity, response of field dependent materials, etc.

Course Topics:
1. What is meant by a continuous body?
2. Kinematics
3. Motion
4. Lagrangian and Eulerian perspective
5. Displacement
6. Velocity
7. Deformation gradient
8. Displacement gradient
9. Polar-decomposition theorem
10. Stretch tensors
11. Rotation tensors
12. Stretch along a direction
13. Shear
14. Various non-linear measure of strain
15. Linearization of the non-linear strain
16. Relative deformation gradient
17. Relative stretch tensors
18. SCauchy stress
19. Piola-Kirchoff stress
20. Galilean invariance and frame indifference
21. Material symmetry
22. Balance of mass
23. Linear momentum
24. Angular momentum and energy
25. Constitutive theory
26. Simple material
27. Constitutive theory for an elastic body: general non-linear elastic body, linearized elastic body
28. Constitutive theories for fluids: Euler fluid, Navier-Stokes fluid
MEEN 410/611: Internal Combustion Engines

Catalog Description:
Advanced thermodynamics of cycles for internal combustion engines, including fuels and combustion; performance characteristics of various types of engines.

Course Level: ☒ Undergraduate ☒ Graduated  Instructional Method: ☒ Traditional, face-to-face ☒ Web-based

Prerequisites: Graduate standing; MEEN 315 and MEEN 344 or equivalents

Textbook(s) and Supplemental Material:
None

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Learning Outcomes and/or Course Objectives:
1. Describe basic engine types, terminology, and cycles
2. Understand the basic operating characteristics of engines
3. Understand the four-stroke and two-stroke engine cycles
4. Understand and analyze the simple air-standard cycles for engines
5. Understand the thermochemistry regarding air and fuel combustion in engines
6. Understand the implications of fuels on engine performance
7. Understand the air induction processes
8. Understand the fuel induction processes
9. Understand the combustion processes
10. Understand the emissions from engines
11. Understand the heat transfer and friction processes of engines
12. Understand the various engine modeling approaches
13. Understand engine testing facilities
14. Write technical reports both individually and within teams

Course Topics:
1. Basic engine types, terminology and cycles
2. Operating characteristics
3. Engine cycles
4. Thermochemistry and fuels
5. Air and fuel induction
6. Fluid motion within the combustion chamber
7. Combustion
8. Exhaust flow, turbocharging, EGR
9. Emissions and air pollution
10. Heat transfer in engines
11. Friction and lubrication
12. Engine modeling
13. Engine design
14. Experimental facilities
15. Special topics
MEEN 612: Mechanics of Robot Manipulators

Catalog Description:
Forward and inverse kinematics and differential kinematics of robot manipulators, path planning, motion planning, dynamics of robot manipulators, control algorithms; PD/PID control, computer torque algorithm, robust and adaptive control algorithms, feedback linearization.

Course Level:  ☐ Undergraduate  ☒ Graduate
Instructional Method:  ☒ Traditional, face-to-face  ☐ Web-based

Prerequisites:  Graduate standing

Textbook(s) and Supplemental Material:

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Learning Outcomes and/or Course Objectives:
To enable the students to have a working knowledge of modeling, analysis and control of robotic manipulators and mobile robots.

Course Topics:
1. Positions, orientations and frames, translations, rotations and transformations
2. Linear algebra and other math preliminaries
3. Forward kinematics of robotic manipulators
4. Inverse kinematics of robotic manipulators
5. Jacobians, velocity propagation and force transformations
6. Deriving dynamic equations of motion for robotic manipulators
7. Trajectory generation
8. Motion planning in mobile robots
9. Control of manipulators
10. Adaptive control, mobile robot motion planning algorithms
MEEN 613: Engineering Dynamics

Catalog Description:
Three dimensional study of dynamics of particles and rigid bodies and application to engineering problems; introduction to Lagrange equations of motion and Hamilton's principle.

Course Level: ☐ Undergraduate ☑ Graduate

Instructional Method:
☒ Traditional, face-to-face ☑ Web-based

Prerequisites: Graduate standing; MEEN 363 and MATH 308 or equivalents

Textbook(s) and Supplemental Material:

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Learning Outcomes and/or Course Objectives:
This course involves rigid body dynamics including kinematics and kinetics. Students will be taught to derive models for rigid bodies using Newtonian and variational calculus approaches. Students will also be guided on the analysis and numerical solutions for governing equations of motion.

Course Topics:
1. Particles kinematics
2. Planar (2D) kinematics of rigid bodies
3. Lagrange’s equation of motion (L_EOM): deriving Lagrange’s EOMs; L_EOM with generalized coordinates; conservation of momenta from L_EOM; algebraic kinematic constraints; accounting for algebraic constraints with Lagrange multipliers
4. 3D vector kinematics: governing force and moment equations and kinetic energy of a rigid body; properties of the inertia matrix; parallel axis theorem; fixed-axis-rotation; applications of the general governing equation; Euler’s equations to general prescribed motion; moment-free motion of axisymmetric body, Euler’s symmetrical parameters; stability of motion of a spinning body; force and moment equations using a non-body-fixed coordinate system
MEEN 615: Advanced Engineering Thermodynamics

Catalog Description:
Theories of thermodynamics and their application to more involved problems in engineering practice and design; equilibrium, Gibbs’ function, nonideal gases and various equations of state; second law analysis and statistical theory.

Course Level: ☒ Graduate

Instructional Method: ☒ Traditional, face-to-face

Prerequisites: Graduate standing; MEEN 421 or equivalent

Textbook(s) and Supplemental Material

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Learning Outcomes and/or Course Objectives:
The objective of this course is to improve students’ understanding of thermodynamics concepts and their application to advanced (and real world) situations. Furthermore, basic thermodynamics concepts covered in undergraduate courses is reviewed and specific new topics in applied thermodynamics, e.g., classical nucleation theory, are introduced.

Course Topics:
1. Thermodynamics theories and their application to the more involved problems in engineering practice/design
2. First and Second laws, thermodynamics cycles, transient processes/systems, irreversibility, and efficiency (graduate perspective)
3. Exergy/availability analysis
4. Ideal and non-ideal gases, and property relations (Maxwell’s relations)
5. Mixtures
6. Phase and chemical equilibrium
7. Nucleation
8. Combustion
9. Statistical thermodynamics
MEEN 616: Surface Science

Catalog Description:
Properties of surfaces, principles of classic and contemporary surface characterization techniques, recent development and roles of surface science in advanced technology.

Course Level: ☒ Graduate  ☐ Undergraduate  
Instructional Method: ☒ Traditional, face-to-face  ☐ Web-based

Prerequisites:  Graduate standing

Textbook(s) and Supplemental Material

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Learning Outcomes and/or Course Objectives:
To develop an understanding of fundamental principles of materials’ surfaces and interfaces, to learn to interpret data of surface characterization, and methods to apply those principles to materials research, real-life problem solving, and new technology development.

Course Topics:
1. Physical, mechanical, and chemical properties of surfaces
2. Electronic and atomic structures of surfaces
3. Nan and particulate materials
4. Intermolecular forces
5. Interfaces
6. Particle-surface and surface-surface interactions
7. Surface crystallography and diffraction (LEED, RHEED, etc.)
8. E-spectroscopies (XPS, AES, ILS, UPS, etc.)
9. Ion-spectrometries (INS, LEIS, MEIS, SIMS, etc.)
10. Deposition spectroscopies (TPD, ESDIAD)
11. Atomic probe microscopy (STEM, AFM, etc.)
12. Atomic- & molecular-beam scattering techniques
13. Vibrational spectroscopies (EELS, IRAS, HREELS, etc.)
MEEN 617: Mechanical Vibrations

Catalog Description:

Course Level: ☐ Undergraduate ☒ Graduate
Instructional Method: ☒ Traditional, face-to-face ☐ Web-based

Prerequisites: Graduate standing; MEEN 364; MATH 308; or equivalents

Textbook(s) and Supplemental Material:

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Learning Outcomes and/or Course Objectives:

Course Objectives: To provide the fundamental analytical and numerical tools for analysis and modeling of vibration phenomena in discrete and continuum SDOF and MDOF linear systems.

Learning outcomes: The lectures will broaden the coverage of the textbook and provide examples of analysis as applied to the modeling, analysis and interpretation of the dynamic response of linear mechanical systems.

Course Topics:
2. Proportional and Non-proportional Damping: Viscous, Hysteretic, Coulomb
3. Two Degree of Freedom Systems (2-DOF): Harmonic Response, Complex Impedance
5. Modeling of Physical Structures- Newtonian Perspective: Newtonian Dynamics, Strings, rods, beams, plates, etc., Separable Solutions
6. Modeling of Physical Structures- Hamiltonian Perspective: Hamiltonian Dynamics, Strings, rods, beams, plates, etc., Separable Solutions
7. Solutions by Modal Analysis
8. Approximate Methods: Assumed Modes, Raleigh Ritz
MEEN 618: Energy Principles and Variational Methods in Applied Mechanics

Catalog Description:
Principles of virtual work, minimum total potential energy and extremum mixed variational principles; energy theorems of structural mechanics; Hamilton’s principle for dynamical systems; Rayleigh-Ritz Galerkin and weighted-residual methods; applications to linear and nonlinear problems in mechanics (bars, beams, frames, plates and general boundary value problems).

Course Level: ☒ Graduate
Instructional Method: ☒ Traditional, face-to-face

Prerequisites: Graduate standing; MATH 601 or equivalent; course on mechanics of deformable bodies or elasticity or equivalent

Textbook(s) and Supplemental Material:
6. Instructor’s website: http://mechanics.tamu.edu

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Learning Outcomes and/or Course Objectives:
1. Vector approach to derive the equations of bars, beams and plates
2. Use work and energy principles to determine point forces and displacements of beams, trusses, frames, and plate structures
3. Derivation of governing equations (including boundary conditions) using variational approaches
4. Determination of approximate solutions to engineering problems using classical variational methods
5. Develop finite element models of solid and structural mechanics problems

Course Topics:
1. Vectors and tensors
2. Applications of the summation convention to prove vector identities
3. Solid mechanics equations (review)
4. Theories of straight beams
5. Work and energy; strain and complementary strain energies
6. Virtual work and complementary virtual work
7. Calculus of variations
8. Principle of virtual displacements; unit dummy displacement method
9. Principle of minimum potential energy and Castigliano’s Theorem
10. Principle of virtual forces and unity dummy load method
11. Principle of minimum complementary energy; Castigliano’s Theorem II
12. Clapeyron’s, Maxwell’s, and Betti’s Theorems
13. Hamilton’s Principle and applications
14. Ritz Method and applications
15. Weighted-residual method and applications
16. Classical Plate Theory
17. First-Order Plate Theory
18. Finite Element Method for bars and beams; applications of bar and beam elements
19. Finite Element models of plates
MEEN 619: Conduction and Radiation

Catalog Description:
Solutions of steady and transient problems with method of separation of variables, finite difference numerical methods, Duhamel’s Theorem, Green’s function, and Laplace transform, the phase change problems. View factors; radiative properties of surfaces and participating media, radiative exchange; gas radiation; and advanced solution methods for thermal radiation.

Course Level: ☒ Graduate
Instructional Method: ☒ Traditional, face-to-face
☐ Web-based

Prerequisites: Graduate standing; MEEN 344 and MEEN 461 or equivalent

Textbook(s) and Supplemental Material
2. Analytical Heat Transfer, Han
3. Heat Conduction, M. N. Ozisik

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Learning Outcomes and/or Course Objectives:
1. Decompose a real heat transfer problem into simpler cases studied in the class
2. Construct a mathematical description for a specified conductive, convective and radiative heat transfer problem
3. Solve the mathematical equations for a specified heat transfer problem in order to obtain the temperature distribution and the heat transfer rate
4. Remember classical solutions of typical heat transfer problems

Course Topics:
1. Governing equation for conductive heat transfer; BCs and ICs
2. 2D separation of variables technique with Cartesian and cylindrical coordinates
3. Numerical method for transient and steady-state heat conduction
4. Approximated method
5. Duhamel’s superposition theorem and applications
6. Green’s function method and applications
7. Laplace transform and applications
8. Phase-change problems
9. Melting and solidification of pure substances
10. Fundamental concepts of thermal radiation
11. Particle type thermal radiation analysis
12. Equation of radiative transfer (absorption, emission and scattering)
13. Blackbody with and without absorbing gas
14. Gray surfaces with and without absorbing gas
15. Optically thick and optically thin limits
16. Method of discrete ordinates
17. Wave type thermal radiation analysis
18. Radiation properties of real surfaces and real gases
MEEN 621: Fluid Mechanics

Catalog Description:
Dynamics of two-dimensional incompressible and compressible fluids; viscous flow in laminar and turbulent layers, the Navier-Stokes equations and boundary layer theory.

Course Level: ☒ Graduate

Instructional Method: ☒ Traditional, face-to-face ☒ Web-based

Prerequisites: Graduate standing; MEEN 344 or equivalent

Textbook(s) and Supplemental Material:
Serge Lang, Linear Algebra.

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Learning Outcomes and/or Course Objectives:
MEEN 612 is intended to introduce students to the fundamentals of fluid mechanics at a graduate level. It will provide a broad physically and mathematically based overview of the subject and the foundation for more advanced fluid courses such as computational fluid dynamics, hydrodynamic stability, and turbulence.

Learning outcomes:
1. Understanding the basic principles such as Newton’s second law, conservation of mass, energy balance and their derivation.
2. Assumptions required to derive common equations such as Bernoulli or Navier-Stokes Equations from these basic principles and applying these principles to new situations.

Course Topics:
1. Basic Concepts
2. Fluid Motion
3. Conservation Equations
4. Exact Solutions
5. Vorticity Equation
6. Potential Flow
7. Boundary Layer Theory
8. Turbulent Flow Concepts
MEEN 625: Mechanical Behavior of Materials

Catalog Description:
Examination of deformation and microstructure mechanisms responsible for deformation and failure in metals; fatigue, creep, and fracture mechanisms of materials; emphasis on microstructural-mechanical property relationship.

Course Level:  ☑ Graduate  ☐ Undergraduate  ☑ Traditional, face-to-face  ☐ Web-based

Prerequisites:  Graduate standing; MEEN 360 and 361 or equivalents; undergraduate-level materials science course

Textbook(s) and Supplemental Material:

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Learning Outcomes and/or Course Objectives:
1. Predict elastic deformations in isotropic, anisotropic and composite materials
2. Predict the yielding failure of engineering materials and components under multiaxial stress states;
3. Explain the effect of microstructural features and deformation mechanisms on flow of materials.
4. Analyze crack growth behavior of engineering materials;
5. Predict the fatigue life of engineering components subjected to cyclic loading

Course Topics:
1. Range of mechanical behavior
2. Design for strength/stiffness/stability & durability
3. Experiments for determining mechanical properties
4. Spring/Dashpot models for material response
5. Deformation and strain
6. Stress
7. Equilibrium
8. Elastic response
9. Anisotropy of crystals
10. Composite materials
11. Plasticity: geometrical view
12. Yielding and hardening
13. Cyclic loading and plastic response
14. Dislocation motion and plasticity
15. Fracture mechanics
16. LEFM: Stress intensity and energy based approaches
17. Stress intensity factor
18. Crack tip plasticity
19. Fatigue
20. Empirical stress life and strain life
21. Damage tolerant design
22. Crack propagation laws
23. Crack closure
24. Multiaxial fatigue and microstructural fatigue mechanism
25. Creep
MEEN 626: Lubrication Theory

Catalog Description:
Development of Reynolds equation from Navier-Stokes equation for study of hydrodynamic lubrication theory as basis for bearing design; application to simple thrust and journal bearings and pads of various geometries; hydrostatic lubrication, floating ring bearing, compressible fluid (gas) lubrication, grease lubrication, dynamically loaded bearings, half speed whirl and stability.

Course Level: ☑ Graduate

Instructional Method: ☑ Traditional, face-to-face

Prerequisites: Graduate standing; MEEN 344 and MATH 308 or equivalents

Textbook(s) and Supplemental Material:
1. San Andrés, L. Modern Lubrication Theory, Class Notes (~450 pages) available at URL site http://rotorlab.tamu.edu/me626/default.htm
2. Childs, D., Turbomachinery Rotordynamics with Case Studies, Minter Spring Publisher, 2013.
7. 5.

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Learning Outcomes and/or Course Objectives:
To introduce the fundamental physical principles of the classical theory of hydrodynamic lubrication, to learn about the applications of bearings and seals in oil & gas rotating machinery, and to introduce process fluid film bearings for high speed applications. The class material emphasizes the understanding of physical principles and the effects of fluid film bearings on the dynamics of rotating machinery.

Course Topics:
1. Classical lubrication
2. 1-dimensional bearings
3. Kinematics of motion in cylindrical journal bearings
4. Static load performance of plain journal bearings
5. Dynamics of rigid rotor-fluid film bearing system
6. Liquid cavitation in fluid film bearings
7. Thermohydrodynamic analysis of finite length fluid film bearings including inertia
8. Turbulence in fluid film bearings
9. Fluid inertia and turbulence in fluid film bearings
10. Thermohydrodynamic bulk-flow models
11. Applications of oil seals in turbomachinery
12. Gas seals
13. Annular pressure (damper) seals and hydrostatic bearings
14. Squeeze film dampers
15. Experimental methods and analyses for identification of bearing force coefficients
16. Gas film lubrication and gas bearings for microturbomachinery
17. Overview of tilting pad bearings
MEEN 628: Heat Transfer – Convection

Catalog Description:
Mathematical theory of convection energy transport; applications to the design of heat-transfer apparatus.

Course Level: ☐ Undergraduate  ☑ Graduate

Instructional Method: ☑ Traditional, face-to-face  ☐ Web-based

Prerequisites:  Graduate standing; MEEN 461; MATH 601 or registration therein

Textbook(s) and Supplemental Material

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Learning Outcomes and/or Course Objectives:
Upon completion of the course, students should
1. Know the development of the Navier-Stokes equations and their application to boundary layer theory;
2. Know how to solve laminar external and internal flow and heat transfer problems;
3. Know how to apply the Reynolds Averaged Navier-Stokes equations to external and internal turbulent flow and heat transfer problems;
4. Be able to recognize and solve natural convection problems;
5. Understand the physical mechanisms associated with transitional or high speed flows.

Course Topics:
1. Boundary Layer Equations
2. Laminar Boundary Layer Heat Transfer – Similarity Method/Analytical Solution
3. Laminar Boundary Layer Heat Transfer – Integral Method/Approximate Solution
4. Laminar Boundary Layer Heat Transfer – Fully Developed/Analytical Solution
5. Laminar Internal Flow Heat Transfer – Thermal Entry/Separation of Variable
6. Natural Convection Heat Transfer/Mixed Convection Heat Transfer
7. Transition Phenomena
8. Transition Heat Transfer
10. Turbulent Boundary Layer Flow – Reynolds Analogy/Turbulent Prandtl Number
12. Advanced Convection Heat Transfer Topics
MEEN 630: Intermediate Heat Transfer

Catalog Description:
Application of basic laws to the analysis of heat and mass transfer; exact and approximate solutions to conduction, convection and radiation problems; current status of single and two-phase heat transfer for application to design.

Course Level: ☒ Graduate

Instructional Method: ☒ Traditional, face-to-face

Prerequisites: Graduate standing; undergraduate courses in fluid mechanics and heat transfer.

Textbook(s) and Supplemental Material:
1. Fundamentals of Heat and Mass Transfer, 7th, Incropera et al., Wiley
2. Head Conduction, 2nd, Ozisik, Wiley
4. Thermal Radiation Heat Transfer, 5th, Siegel, Taylor & Francis

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Learning Outcomes and/or Course Objectives:
After finishing this course, students should have the ability of:

1. Identify the type(s) of heat transfer (conduction, convection and radiation) for the physical scenario considered.
2. Decompose a real heat transfer problem into simpler cases studied in the class.
4. Solve the mathematical equations for a specified heat transfer problem in order to obtain the temperature distribution and the heat transfer rate.
5. Remember the characteristics of classical solutions of typical heat transfer problems.

Course Topics:
1. Introduction; Governing equations; Boundary and initial conditions
2. Steady state 1D heat conduction; Fin problems
3. 2D Separation of variables technique with Cartesian coordinates
4. 2D Separation of variables technique with cylindrical coordinates
5. 2D heat conduction problem with heat generation term
6. Separation of variables technique with unsteady heat conduction
7. 1D transient heat conduction in a semi-infinite body (similarity method)
8. Finite difference method (transient and steady-state)
9. Numerical stability analysis
10. Boundary layer theory; Similarity variable method
11. Friction and heat transfer coefficients from similarity method
12. Friction and heat transfer coefficients from integral method
13. Internal flow and heat convection
14. Friction and heat transfer coefficient for internal flow
15. Free convection on a vertical wall and the associated similarity solution
16. Heat transfer coefficient for free convection
17. Characteristic of turbulent flow; Prandtl mixing length theory
18. Friction coefficient for turbulent flow
19. Fundamental concepts of thermal radiation; Black body
20. Emission from real surfaces; Absorptive, reflectivity, and transmissivity
21. View factor and methods to evaluate view factor
22. Radiation among isothermal gray surfaces without gas
23. Radiation circuit method
24. Gas radiation; Emission and absorption coefficients
25. Radiation circuit method with absorbing gas
26. Radiation with conduction and convection
27. Review
MEEN 442/632: Computer Aided Engineering

Catalog Description:
An integrated learning environment that is responsive to industrial need for mechanical engineers with multi-disciplinary design skills; three essentials emphasized in strong teamwork environment; design concept development, design optimization and effective communication via engineering drawings.

Course Level: ☑ Undergraduate  ☑ Graduate  ☐ Traditional, face-to-face  ☐ Web-based

Prerequisites:  Graduate standing; MEEN 363; MEEN 368

Textbook(s) and Supplemental Material:
2. SolidWorks (SW) 2019-2020

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Learning Outcomes and/or Course Objectives:
1. Demonstrate a greater understanding of the Solidworks environment
2. Navigate the Solidworks environment with greater ease
3. Understand basic steel manufacturing methodologies
4. Understand basic manufacturing processes
5. Demonstrate a deeper understanding for FEA, uses and limitations
6. Develop FEA skills for the proper implementation of constraints and forces
7. Possess the ability to interpret basic FEA results
8. Create parts and assemblies with Solidworks
9. Create weldments and sheet-metal parts in Solidworks
10. Create meaningful fabrication drawings
11. Understand basic principles in design methodology as applied to manufacturing

Course Topics:
1. SolidWorks Introduction & Environment
2. Creating Basic Solids - Extrude; Revolve
3. SW: Loft; Shell; Sweep; Volute
4. Reading Drawings; Assigning Materials & Textures
5. SW Assembly Basics
6. Advanced Assemblies
7. Steel Forming Methods I & II
8. Structural Steel Properties, Profiles, and Design Considerations
9. SW Sheet Metal I & II
10. Welding Types and Design Considerations
11. SW Weldments I; Library Uses; Hole Wizard
12. Combining Sheet Metal and Weldments
13. Manufacturing Drawings I & II
14. FEA Introduction and Theory
15. FEA on a Single Part I & II
16. FEA on an Assembly
17. Introduction to CFD and V&V
MEEN 434/634: Dynamics and Modeling of Mechatronic Systems

Catalog Description:

Course Level: ☒ Undergraduate ☒ Graduate  
Instructional Method: ☒ Traditional, face-to-face ☐ Web-based

Prerequisites:  MEEN 364; MATH 308; MEEN 357

Textbook(s) and Supplemental Material:

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Learning Outcomes and/or Course Objectives:

Course Objectives:
1. Understand dynamics and modeling of lumped-parameter and continuum electromechanical systems.
2. Analyze and design linear and nonlinear actuators and transducers as crucial elements in electromechanical systems.

Course Outcomes:
1. Understand and model mechanical-electrical interactions with dynamics and electromagnetics principles using lumped elements.
2. Determine force using force-energy and force-coenergy relations in lumped electromechanical systems.
3. Analyze and model magnetic circuits. This will enable you to design linear and nonlinear actuators including voice-coil actuators, electromagnets, etc.
4. Analyze and design rotary and linear DC and AC motors.
5. Understand dynamics of mechatronic systems.
7. Understand dynamics of electromechanical continua, and derive equations of motion of magnetizable elastic strings/membranes under the influence of time-varying field.
**Course Topics:**

1. Review of vector calculus, electric field theory, magnetic field theory, and quasistatic approximations
2. Constitutive laws, Energy conservation, force-energy relations
3. Coenergy, force-coenergy relations, magnetic circuits
4. Energy conversion cycles, systems with multiple terminals, variable-reluctance actuators
5. Permanent magnets, coupled mechanical and electromagnetic systems
6. Static equilibria, linearization about static equilibria
7. Dynamic equilibria and linearized dynamics, active stabilization, magnetic levitation example
8. Field transformations, conduction conservative laws
9. DC Machines, magnetic diffusion
10. Magnetic diffusion in sinusoidal steady state and in convective media, charge relaxation
11. Quasistatic stress tensor
12. One-dimensional elastic continua, dynamics of electromechanical continua
13. Electromechanical dynamics with convection, introduction to continuum electromechanics
MEEN 635: Flow & Fracture in Polymeric Solids

Catalog Description:
Relationship of molecular structure to flow and fracture in polymeric materials; introduction of viscoelastic fracture mechanics; micromechanisms of fracture including crazing; fatigue behavior of polymeric materials.

Course Level: ☑ Graduate  Instructional Method: ☑ Traditional, face-to-face
☐ Undergraduate ☐ Web-based

Prerequisites: Graduate Standing

Textbook(s) and Supplemental Material:
1. A.F. Yee and T. Narisawa, “Fracture Behavior of Polymers”

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Learning Outcomes and/or Course Objectives:

Learning Outcomes:
The students are expected to learn both fundamental and practical aspects of polymer material science, especially for topics related to deformation and fracture of polymers and composites. In particular, the students are expected to master polymer structure property relationship through understanding of how polymer structure and morphology influence physical and mechanical properties, how the processing parameters affect morphology and properties of polymers, and how the toughening agent and filler particles change polymer properties. Comprehensive knowledge gained will well prepare the students for both academic and industrial career needs.

Course Objectives:
1. To provide both fundamental and practical knowledge related to mechanical and fracture behaviors of polymers and composites
2. To facilitate discussions and critiques on recent research activities in literature
3. To better prepare students for an engineering material career

Course Topics:
1. Polymer Structure & Morphology
2. Polymer Structure & Morphology (Cont.) Rubber-Like Elasticity/Linear Viscoelasticity
3. Dynamic Mechanical Behavior
4. Time-Temperature Superposition
5. Stress-Strain Behavior
6. Fracture Mechanisms/Toughening Principles (I)
7. Creep & Fatigue Fracture
8. Impact Fracture
9. Composite Fracture
10. Surface Deformation and Damage
11. Polymer Nanocomposites
12. Nanotechnology Related Issues
MEEN 636: Turbulence Theory and Applications

Catalog Description:
Characteristics, concepts, and relationships of detailed turbulent flow analysis and measurement; turbulence origin, energy production, cascade and dissipation; correlation functions, spectra and length scales; closure modeling of the Reynolds-averaged governing equations.

Course Level: ☐ Undergraduate ☒ Graduate ☐ Web-based

Instructional Method: ☒ Traditional, face-to-face

Prerequisites: Graduate standing; MEEN 621

Textbook(s) and Supplemental Material:
4. *An Introduction to Turbulence and its Measurement* by P. Bradshaw Pergamon, 1971

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Learning Outcomes and/or Course Objectives:
This course is intended to introduce beginning graduate students to the theory of turbulence, as well as the applications of the theory to real world flows. We will be exclusively concerned with turbulence in incompressible fluids. The course begins with a brief derivation of the Navier-Stokes equations. We will then proceed to discuss the theory of homogeneous-isotropic turbulence, before introducing the complicating effects of shear. Some aspects of wall-bounded turbulence will be discussed, along with the idea of coherent structures in turbulence. Models used in CFD such as k-epsilon, Reynolds-averaged Navier-Stokes (RANS), Large-eddy (LES), and Direct (DNS) will be discussed. Specially designed projects are intended to enable students to apply what they have learned to different flow situations

Course Topics:
1. Vectors and Tensors, kinematics and vorticity, conservation, and Navier-Stokes Equations
2. Introduction to Turbulence
3. Averages in Turbulence
4. Correlations and Spectra (Continuous Form and Discrete Form)
5. Symmetries
6. Homogeneous Isotropic Turbulence
7. Introduction to Wall-bounded Turbulence
8. Introduction to Turbulence Models (RANS, k-epsilon, LES, DNS)
9. Coherent Structures (KL Theory)
10. Non-Newtonian Models
MEEN 638: Mechanics of Non-linear Fluids

Catalog Description:
Introduction to classifications of flows, constitutive theory, fluids of the differential type.

Course Level:  ☐ Undergraduate  ☑ Graduate

Instructional Method:  ☑ Traditional, face-to-face  ☐ Web-based

Prerequisites:  Graduate standing and approval of instructor

Textbook(s) and Supplemental Material:
None

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Learning Outcomes and/or Course Objectives:
The aim of this course is to provide the student with familiarity in several areas of non-linear fluid mechanics including the response of a variety of non-Newtonian fluids.

The student will be able to demonstrate his/her understanding of and proficiency in the subject matter and will be able to make a judicious evaluation of how to model a macroscopic phenomenon in a wide range of areas, from among competing models, using the tools of continuum mechanics.

Course Topics:
1. Introduction to the general behavior of non-linear fluids
2. Kinematics
3. Introduction to constitutive relations for non-linear fluids and their general classification
4. Mechanics of fluids of the differential type
5. Stability of fluids of the differential type
6. Introduction to the notion of natural configuration and the basis of its evolution
7. Development of Rate type constitutive fluid models
8. Integral type constitutive relations
9. Specific applications.
MEEN 639: Dynamics of Rotating Machinery

Catalog Description:
Dynamic stability, critical speeds and unbalanced response of rotor-bearing systems; special problems encountered in modern applications operating through and above critical speeds.

Course Level:  ☐ Undergraduate  ☑ Graduate

Instructional Method:  ☑ Traditional, face-to-face  ☐ Web-based

Prerequisites:  Graduate standing or approval of instructor; MEEN 363 or equivalent

Textbook(s) and Supplemental Material:
1. Practical Rotordynamics by Dr. Wen Jeng Chen.
2. Childs, Dara: Turbomachinery Rotordynamics with Case Studies
4. John Vance, Fouad Zeidan, Brian Murphy. Machinery vibration and rotordynamics
5. Adams, Maurice, Rotating Machinery Vibration: From Analysis to Troubleshooting  2001
6. Lalanne, Michel: Rotordynamics Prediction in Engineering
7. Dimarogonas, Andrew: Analytical Methods in Rotordynamics
8. Ehrich, Fred: Handbook of Rotordynamics

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Learning Outcomes and/or Course Objectives:
1. An ability to develop structural models for simulating vibrations of rotating shafts. These models range from simple low degree of freedom lumped mass models to complex finite element based models.
2. Ability to integrate dynamical forces and moments resulting from the structure rotating at high speeds into the structural model in (1). This includes gyroscopic and Coriolis forces and forces readily described in a rotating frame of reference.
3. Ability to develop computational fluid dynamical models of lubricant flows in oil film bearings and leakage flows in shaft seals using the principles of fluid conservation and equilibrium
4. Ability to develop software to solve structural and fluid dynamical problems utilizing finite element methods.
5. Ability to combine the structural and fluid mechanic models into a coupled fluid structure interaction FSI problem and solve via software development.
6. Ability to solve for key quantities required in industry for designing turbines, compressors, motors, etc., such as critical speeds, stability parameters, natural frequencies, mode shapes, etc.
7. Ability to develop magnetic field models for the analysis and design of magnetic bearings.
8. Ability to develop coupled electro-fluidic-structural models to code and solve for the response of industrial shaft systems supported with magnetic bearings.
Course Topics:
10. Simple Jeffcott Rotor Model
11. Magnetic Bearings Theory and Practice
12. Forward Circular Synchronous Lateral Vibration Critical Speeds by the Transfer Matrix Method
13. Structural Finite Elements for Rotordynamics Simulations
14. Intro to Finite Element Modeling for Fluid Film Bearing Simulation
15. Fluid Film Bearing Analysis
16. Liquid Seal Analysis
17. Impeller dynamic force coefficient modeling
18. Least Squares Rotor Balancing
19. Steady State Solutions for Nonlinear Rotordynamic Systems
20. Drillstring Rotordynamics
21. Electric Motor Effects on Rotodynamics
22. “Synchronous Instability” Morton Effect
MEEN 642: Gas Turbine Heat Transfer and Cooling Technology

Catalog Description:
Focus on the range of gas turbine heat transfer issues and associated cooling technologies; fundamentals, turbine heat transfer, turbine film cooling, turbine internal cooling with rotation, experimental methods, numerical modeling and final remarks; provide solid background for research and design in turbomachinery heat transfer.

Course Level: ☐ Undergraduate ☒ Graduate
Instructional Method: ☒ Traditional, face-to-face ☐ Web-based

Prerequisites: Graduate standing; MEEN 344, MEEN 461

Textbook(s) and Supplemental Material:

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Learning Outcomes and/or Course Objectives:
1. Understand the basic gas turbine heat transfer and cooling technology
2. Apply the experimental results to predict heat transfer and film cooling
3. Apply the experimental results to predict internal heat transfer/cooling
4. Apply the knowledge for preliminary design of cooled blade and vane

Course Topics:
1. Fundamentals: Discuss the need for turbine cooling, gas turbine heat-transfer problems, and cooling methodology.
2. Turbine Heat Transfer: Discuss turbine rotor and stator heat-transfer issues including endwall and blade tip region under engine conditions as well as under simulated engine conditions.
3. Turbine Internal Cooling: Include impingement cooling, rib-turbulated cooling, pin-fin cooling, and compound and new cooling techniques.
4. Turbine Film-Cooling: Include turbine rotor and stator film-cooling and a discussion of the unsteady high free-stream turbulence effect on simulated cascade airfoils.
5. Turbine Internal Cooling with Rotation: Discuss the effect of rotation on rotor, coolant passage heat transfer.
6. Experimental Methods: Include heat-transfer and mass-transfer techniques, liquid crystal thermography, optical techniques, flow, and thermal field measurement techniques.
7. Numerical Methods: Discuss governing equations and turbulence models, and their applications for predicting turbine blade heat-transfer and film-cooling and turbine blade internal cooling.
8. Final Remarks: Provide suggestions for future research in this area.
MEEN 643: Experimental Methods in Heat Transfer and Fluid Mechanics

Catalog Description:
Experimental methods including experiment planning and design, mechanics of measurements, error and uncertainty analysis, standards and calibration, temperature measurement, interferometry, flow rate measurement, hot wire anemometry, subsonic and supersonic flow visualization and data analysis; selected experiments conducted.

Course Level:  ☐ Undergraduate  ☒ Graduate
Instructional Method:  ☒ Traditional, face-to-face  ☐ Web-based

Prerequisites:  Graduate standing; MEEN 461 or equivalent

Textbook(s) and Supplemental Material:
None

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Learning Outcomes and/or Course Objectives:
1. Apply the experimental methods to run the basic experiments for pressure and flow measurements, temperature and heat flux measurements, experimental planning and analysis of results, and steady state heat transfer measurements
2. Apply the experimental methods to run the advanced experiments for steady-state and time-dependent flow conditions
3. Apply the experimental methods to run the advanced experiments for mass transfer analogy measurement, flow and thermal field measurement, and flow field measurements by particle velocimetry (PIV) measurement

Course Topics:
1. Conduction, convection and radiation
2. Experimental methods in heat transfer and fluid mechanics
3. Pressure, velocity and flow rate measurements – fundamental principles, probes, meters, fabrication, calibration, measurements
4. Error estimates by pressure transducers, pressure probes, static pressure taps, flow meters
5. Temperature and heat flux measurements – fundamental principles, type K & T thermocouples, heat flux gauges, fabrication, calibration, measurements
6. Error estimates by thermocouples and heat flux gauges – temperature measurements in solids, in fluids, high-speed gas flows
7. Experimental planning – literature survey, test section design, fabrication, calibration, measurements
8. Analysis of results – data reduction, uncertainty analysis, least squares curve fitting, comparisons, conclusions
9. Steady state heat transfer measurement techniques – copper plate heaters with thermocouples, thin foil heaters with thermocouples
10. Time-dependent heat transfer measurement techniques – transient experimental techniques, time-resolved thin-film heat flux gauges, one-D transient technique
11. Liquid crystal thermography techniques – stead-state yellow-band tracking technique, stead-state hue, saturation, intensity (HSI) technique, transient single-color capturing technique, transient HSI technique
12. Optical thermography techniques – infrared thermography (IR), steady state & transient IR radiation pyrometry, high temperature thermal paint
13. Pressure and temperature sensitive paint techniques – pressure sensitive paint (PSP) for pressure measurement, temperature sensitive paint (TSP) – steady state, TSP – transient technique
14. Mass transfer analyt measurement techniques – pressure sensitive paint (PSP) for film cooling test, ammonia-diazo technique, foreign gas concentration sampling technique, naphthalene sublimation mass transfer technique
15. Surface flow and visualization techniques – ink dot streak line, carbon powder/oil streamline, smoke & dye flow techniques
16. Flow and thermal field measurement techniques – miniature five-hole/seven-hole probe, miniature thermocouple probe, how-wire anemometry, cold-wire anemometry
17. Flow and thermal field measurement techniques by LDF – laser Doppler velocimetry (LDV), laser spackle photography technique, laser holographic interferometer
18. Flow and thermal field measurement techniques by PIV – participle image velocimetry (PIV), micro particle PIV (micro-PIV), planar laser induced fluorescence (PLIF), stereoscopic particle image velocimetry (S-PIV)
Catalog Description:
Introduction to mechanics; three-dimensional analysis tools and techniques needed to model the linear behavior of fluids and solids in their response to imposed loads and deformations.

Course Level: ☒ Undergraduate ☒ Traditional, face-to-face ☐ Web-based
☒ Graduate

Prerequisites: Graduate standing; Grade of C or better in CVEN 305, MEEN 368, or equivalent.

Textbook(s) and Supplemental Material:
5. Journal papers will also be made available to the students via eCampus.

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Learning Outcomes and/or Course Objectives:
1. The tool of choice for a practicing mechanical engineer is finite elements, or a related technology, whenever it comes time to analyze designs, structural components, or fluid flows. This is not a finite element class. Rather, the focus of this course is on understanding the mathematics, kinematics and kinetics upon which finite elements is built. This class is considered to be a requisite course to prepare students for taking graduate course work in mechanics, such as: finite elements, fluid mechanics, elasticity, viscoelasticity, plasticity, damage mechanics, fracture mechanics, structural mechanics, etc. Simple boundary value problems like axial, biaxial and shear deformations, i.e., experiments usually done to parameterize materials, will be used to illustrate the concepts being learned.
2. At the end of the course, students will be able to: analyze a motion and from it quantify the deformation fields for stretch, strain and their rates; describe and quantify stress; map fields between the Eulerian and Lagrangian configurations; know how to apply the conservation laws of physics in applications of continuum mechanics; and have a cursory understanding of constitutive equations applicable for describing compliant materials.

Course Topics:
1. Introduction to field theory (Freed: Preface & Introduction; Spencer: Chps. 1 & 2)
2. Vector arithmetic and algebra (Freed: App. A; Spencer: Chp. 3)
3. Motion and experiments; HW 1 (Freed: Chp. 1; Spencer: Chp. 4)
4. Tensor arithmetic and algebra (Freed: App. A; Spencer: Chp. 3)
5. Deformation and velocity gradients, experiments (Freed: Chp. 2; Spencer: Chp. 4)
6. Configurations, quotient laws, and covariance vs. contravariance; HW 2 (Freed: App. B)
7. Symmetric decomposition of the deformation gradient, experiments (handouts)
8. Triangular decomposition of the deformation gradient, experiments; midterm (handouts)
9. Strain, strain rate, rotation, spin, experiments; HW 3 (Freed: Chp. 3; Spencer: Chp. 6)
10. Force, traction and stress (Freed: Chp. 4; Spencer: Chp. 5)
11. Overview of conservation laws (Spencer: Chp. 7)
12. Introduction to explicit elasticity, experiments; HW 4 (Freed: Chp. 5)
13. Introduction to implicit elasticity, experiments (Freed: Chp. 6)
14. Introduction to viscoelasticity, experiments (Freed: Chp. 7)
MEEN 646: Aerothermodynamics of Turbomachines

Catalog Description:
Fluid mechanics and thermodynamics as applied to the design of rotating systems; development of turbomachinery equations; detailed aerodynamic design of compressors and turbines.

Course Level: ☒ Graduate  ☐ Undergraduate  
Instructional Method: ☒ Traditional, face-to-face  ☐ Web-based

Prerequisites: Graduate standing; MEEN 414 and MEEN 472; MATH 601 or approval of instructor.

Textbook(s) and Supplemental Material:

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Learning Outcomes and/or Course Objectives:
This course is intended to provide the ME-students with a sound education in turbomachinery design and development needed for turbomachinery, aircraft, and power generation industries. Two engine design projects will be executed with the objective to help the students to gain a solid knowledge of turbomachinery design.

Course Topics:
1. Introduction:
   a. Turbine as a Mechanical Energy Producing Device
   b. Compressor as Mechanical Energy Consuming Device
   c. Application of Turbomachines
   d. Classification of Turbomachines
2. Application of Thermodynamics to Turbomachinery
   a. First Law, Application to Turbomachinery
   b. Second Law, Application to Turbomachinery
3. Fluid Dynamics Applied to Turbomachinery
   a. Momentum Equation, Integral Analysis, Application
   b. Moment of Momentum, Application
   c. Energy Equation, Application
   d. Flow Through Blading
   e. Critical Velocity and Pressure
4. Energy Transfer Applied to Turbomachinery
   a. Turbomachinery Stage
   b. Energy Transfer in Relative System
   c. General Treatment of Turbine and Compressor Stage

5. Theory of Turbine and Compressor Stage
   a. Dimensionless Stage Parameters
   b. Relation between Degree of Reaction and Blade Height

6. Description of Turbine and Compressor Stage
   a. Description of Stage with Constant Mean Diameter
   b. Generalized Dimensionless Stage Parameter

7. Turbine and Compressor Cascade Aerodynamics
   a. Blade Forces in an Inviscid Flow Field
   b. Blade Forces in a Viscous Flow Field
   c. Effect of Solidity on Blade Profile Losses
   d. Drag-Lift Ratio
   e. Optimum Solidity
   f. Generalized Lift-Solidity Coefficient

8. Efficiency, Losses
   a. Individual Losses
   b. Isentropic Efficiency
   c. Polytropic Efficiency
   d. Recovery and Reheat Factors

9. Turbine and Compressor Blade Design
   a. Compressor Blade Profiles
   b. Turbine Blade Profiles

10. Inlets and Exits
    a. Flow in Turbomachinery Inlet Duct
    b. Flow in Turbomachinery Diffuser

11. Axial and Radial Flow Compressor Design
    a. Single Stage Compressor Design
    b. Multi-Stage Compressor Design

12. Axial and Radial Turbine Design
    a. Description of Radial Stages
    b. Radial Cascade Aerodynamics, Optimum Lift-Solidity
    c. Calculation of Stage Efficiency

13. Gas Turbine Engines
    a. Components, System Integration
    b. Off-Design and Dynamic Behavior of Gas Turbine Engines
    c. Theoretical Background
    d. Preparation for Numerical Treatment
    e. One-dimensional Approximation
    f. Modeling of Components
    g. Gas Turbine Engine Simulations
MEEN 649: Nonlinear Dynamical Systems

Catalog Description:
Exact and approximate solutions to nonlinear differential equations; multiple time scales, Lindstedt Poincare, KB, Harmonic balance and other approximate solution techniques; limit cycles, Lyapunov stability theorems, stability of parametrically excited systems, coexisting harmonic solutions, bifurcation theory, shooting approaches for harmonic solutions, chaos, Lyapunov exponents, paths to chaos, synchronization, fractals, practical applications.

Course Level: ☐ Undergraduate ☑ Graduate

Instructional Method: ☐ Traditional, face-to-face ☑ Web-based

Prerequisites: Graduate standing; Course in differential equations; graduate classification or approval of instructor.

Textbook(s) and Supplemental Material:
1. Instructor notes available on eCampus
2. Chaos and nonlinear dynamics: an introduction for scientists and engineers, by R.C. Hilborn
3. Chaotic vibrations: an introduction for applied scientist and engineers, by Francis Moon
4. Nonlinear Oscillations, by A. Nayfeh
5. Nonlinear Ordinary Differential Equations, by R. Grimshaw

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Learning Outcomes and/or Course Objectives:
1. An ability to formulate and identify nonlinear differential equations of dynamic systems.
2. An ability to determine analytical, closed form solutions for simple nonlinear dynamical systems NDS.
3. An ability to utilize the multiple time scales, harmonic balance, Linstedt-Poincare, and other methods, to obtain approximate steady state, limit cycle and free vibration solutions of weakly NDS.
4. The ability to utilize symbolic math packages such as MAPLE, MATHCAD, MATLAB to facilitate obtaining the solutions in (3).
5. The ability to use the Center Manifold Theorem to determine solutions in the neighborhood of an equilibrium point.
6. Ability to identify the stability of an equilibrium point by the Lyapunov 1st and 2nd methods.
7. Ability to utilize Floquet theory in its general form and simplified Mathieu and Hill equation forms, to determine the stability of the solutions of parametrically and periodically excited linear and nonlinear dynamical systems.
8. Ability to determine the parameter conditions required for jump, fold and other forms of bifurcations.
9. Ability to determine sub, super and intermodulation responses, and internal resonances.
10. Ability to utilize the shooting method to determine co-existing steady state responses and their respective stability.
11. Ability to plot bifurcation diagrams utilizing arc length continuation methods
12. Ability to utilize iterated map functions to describe discrete motions in the Poincare plane and paths to Chaos.
13. Ability to determine Lyapunov exponents for chaos identification in integrated map and continuous systems
14. Ability to determine fractional dimensions of fractal patterns
15. Ability to identify paths to chaos such as period doubling, homoclinic, quasiperiodic …

Course Topics:
1. Introductory: Matlab, maple, trigonometric identities; some exact solutions for amplitude dependent natural frequencies; secular term and the multiple time scale method; Hamiltonian; example Nonlinear Systems
2. Equilibrium Point Types and their Stability for the Linearized and Nonlinear System
3. Phase Plane trajectory plots and geometry
4. Limit cycles for impulsively loaded oscillators. Pendulum Clock.
8. Transit time heteroclinic and homoclinic paths, separatrices.
10. Stability: Lyapunov Stability and Instability Theorems
23. Shooting approach for determining the harmonic steady state solutions and their stability.
24. Arc Length Continuation
27. Domains of attraction by the shooting method – Hayashi Plots. Characteristic Multipliers and Bifurcation: Crossing of the Unit Circle.
28. Frequency Locked Motion (entrainment, sychronization)
29. Multi dof systems: Steady state orbital response via the shooting method, HBM approach. Nonlinear Normal Mode Theory, etc.
30. Internal (Autoparametric) Resonance Phenomena
31. CHAOS: Identification by Spectrums, Phase Plane, Poincare Plane, Bifurcation Diagram, Lyapunov Exponent
32. CHAOS: Iterated Map, Feigenbaum No., Henon and Logistic Maps, Cobweb Plots, Stability of Iterated Maps
33. CHAOS: Paths to chaos (Period doubling, quasiperiodic, homoclinic bifurcation)
34. More Applications
MEEN 651: Control System Design

Catalog Description:
Frequency domain design of SISO systems for performance and sensitivity reduction; applications of Kalman filter and LQG/LTR techniques; design of sample-data systems; active control of vibration in distributed parameter systems; describing function and relay controls; application of control principles to engineering design.

Course Level:  ☒ Graduate  ☐ Undergraduate  

Instructional Method:  ☒ Traditional, face-to-face  ☐ Web-based

Prerequisites:  Graduate standing; MEEN 364, MEEN 411 or equivalent, good understanding of linear algebra

Textbook(s) and Supplemental Material:
1. Feedback Control of Dynamic Systems 8th Ed. by Franklin, Powell and Emami-Naeini, Pearson 2014
5. Finite-dimensional Linear Systems by Brockett, Wiley, 1970

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Learning Outcomes and/or Course Objectives:
To enable students to have a working knowledge of:
1. modeling and analysis of linear dynamical systems
2. structural properties (e.g., stability, controllability, observability) of linear systems
3. design of feedback control
4. optimal control
5. digital control
Course Topics:

1. Modeling and analysis of continuous-time linear dynamical system
2. Structural properties of linear system
3. Feedback control design
4. Optimal control
5. Numerical optimal control
MEEN 652: Multivariable Control System Design

Catalog Description:
Advanced issues relevant to the design of multivariable control systems using hybrid (time and frequency domain) design methodologies; design using the LQG/LTR method and advanced practical applications using various robust control system design techniques.

Course Level:  ☒ Graduate  ☐ Undergraduate

Instructional Method:  ☒ Traditional, face-to-face  ☐ Web-based

Prerequisites:  Graduate standing; MEEN 651 or equivalent

Textbook(s) and Supplemental Material:

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Learning Outcomes and/or Course Objectives:
To enable students to have a working knowledge of:
1. Mathematics for abstract linear algebra and infinite dimensional function spaces
2. Stability, performance specifications, and robustness to uncertainty for the multi-input multi-output linear systems
3. Design of optimal controls ($H_2$, $H_\infty$)
4. Application of theories to solve the practical problems and research topics via either simulation or hardware implementation

Course Topics:
1. $H_2/H_\infty$ Spaces
2. Linear Matrix Inequality
3. Internal Stability
4. Performance Specifications and Limitations
5. Balanced Model Reduction
6. Robustness and Uncertainty
7. Linear Fractional Transformation
8. Controller Parameterization
9. LQR, Optimal Linear Estimation
10. LQG/LTR, $H_2$ Controller
11. $H_\infty$ Controller, $\mu$ synthesis
MEEN 653: Scientific Writing

Catalog Description:
Topics include origin and development of scientific writing, research methods, outlines, paper organization, journal selection, strategies to build a productive personal writing culture, effective communication, critical reviews and submission; preparation of an original manuscript for submission to a peer-reviewed journal by the end of the semester.

Course Level:  ☐ Undergraduate  ☒ Graduate  ☒ Traditional, face-to-face  ☐ Web-based

Instructional Method:  ☒ Traditional, face-to-face  ☐ Web-based

Prerequisites:  Graduate standing and approval of instructor.

Textbook(s) and Supplemental Material:

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Learning Outcomes and/or Course Objectives:
1. Recognize when to publish the findings of a technical investigation.
2. Find, evaluate, and summarize the existing literature in the context of a planned paper, and identify general trends, the most important related prior contributions, and gaps in existing knowledge.
3. Understand the differences between the communication objectives and content of a lab or project report, conference paper, and an archival journal publication.
4. Plan and organize a paper for publication in an archival journal.
5. Write a journal quality scientific paper.
6. Select an appropriate journal for publishing and complete an effective submission.
7. Critically review scientific and technical manuscripts.
8. Better respond to critical reviews of their written work.
9. Write technical manuscripts more clearly and easily with self-assurance.
10. Understand related ethical issues.
11. Be more motivated to write.

Course Topics:
1. Non-Tech v. Tech Writing
2. Authors; Acknowledgements; Reviewing and Revising
3. Research Methods
4. Reports, Conference Papers, and Journal Papers
5. Title, Key Words, the Abstract, and sentence construction
6. Writing for Impact; Journal Selection
7. Cultural Considerations; EFL and ESL
8. Plagiarism; Copyrights; Ethics
MEEN 454/654: Tribology-Mechanical Interface Design

Catalog Description:
History and significance of tribology, rough surfaces, hertzian contact, rough surfaces in contact, friction of surfaces in contact, surface failures/wear, boundary lubrication, fluid properties, thick film lubrication, thin film lubrication, micro and nano tribology.

Course Level: ☒ Undergraduate ☒ Graduated

Instructional Method: ☒ Traditional, face-to-face ☐ Web-based

Prerequisites: Graduate standing; C or better in MEEN 344 and MEEN 368

Textbook(s) and Supplemental Material:

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Learning Outcomes and/or Course Objectives:
After finishing this course, students should have the ability to:
1. Understand the mechanism of friction and wear of different material systems including metals, ceramics and polymers
2. Solve contact stress problem under normal and sliding contact conditions
3. Understand the concept of lubrication to ensure a reliable tribological design
4. Use the fundamental concepts of tribology in advanced technological fields, for example designing of micro and nano devices

Course Topics:
1. Introduction, History of Tribology, introduction to friction, wear and lubrication, introduction to micro/nanotribology
2. Engineering surfaces, surface topography, engineering surface contact
3. Surface parameters (descritors), measurement of surface profiles, challenges and scale of surface measurements
4. Contact mechanics, real area of contact, elastic and plastic contact mechanics
5. Contact deformations and stresses, rough surface contact
6. Frictions of solids, friction models, metallic and non-metallic friction
7. Ploughing and other mechanisms
8. Experimental tribology wear
9. Wear modes and maps, erosion and corrosive wear
10. Hydrostatic/Hydrodynamic lubrication, elasto-hydrodynamic lubrication, boundary and solid lubrication, Stribeck curve and dynamic effects
11. Emerging Tribology: surface coating for advanced applications, nanomechanics (interface
12. Nanoindentation and nanoscratch, material properties of thin and ultra-thin solid films
13. Material properties of thin and ultra-thin solid films, applications of tribology: case study
14. Project deadline, project presentations
MEEN 655: Design of Nonlinear Control Systems

Catalog Description:
Design controllers for nonlinear and uncertain systems; apply the designs to mechanical systems.

Course Level: ☐ Undergraduate ☒ Graduate

Instructional Method: ☒ Traditional, face-to-face ☐ Web-based

Prerequisites: Gradient standing; MEEN 651 or equivalent.

Textbook(s) and Supplemental Material:

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Learning Outcomes and/or Course Objectives:
1. Perform Jacobi linearization of finite-dimensional smooth nonlinear systems and be able to design feedback stabilizing controllers.
2. Use Liapunov-based methods to develop nonlinear state-feedback controllers and parameter adaptive controllers for feedback linearizable systems.
3. Simulate and corroborate numerically the effectiveness of developed controllers through a course project.

Course Topics:
4. Nonlinear Control Methods: Sliding Mode Control, Backstepping, Sum of Squares Method, Observer Design and Nonlinear Output Feedback Techniques
MEEN 656: Introduction to Mechanical and Physical Properties of Thin Films and Coatings

Catalog Description:

Course Level: ☑ Graduate  ☒ Traditional, face-to-face  ☐ Web-based

Prerequisites: Graduate standing; MEEN 222 or MEEN 601, or basic materials science background

Textbook(s) and Supplemental Material:
5. Physical Vapor Deposition of Thin Films, By John E. Mahan (2000)

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Learning Outcomes and/or Course Objectives:
1. Provides graduate students with fundamental knowledge on thin films and coatings widely used for a variety of applications.
2. Instills in students the relationships between mechanical and physical properties (thermal, electrical, optical, and magnetic) and the microscopic configuration that results from specific chemical bonding, crystal structure, and microstructure; processing of thin films; defects in thin films; nucleation and growth. Enables students to predict mechanical and physical properties from processing and microstructure.
3. Introduces laboratory experimentation and presentation of materials test results.

Course Topics
1. Thin film deposition techniques, sputtering
2. Microstructure and defects in thin films
3. Epitaxy, texture, grain size, dislocations, interface
4. Nanomechanical testing techniques
5. Film stress and curvature of substrate
6. Delamination and fracture of films
7. Epitaxy, stress and critical thickness
8. Electromigration
9. Magnetic properties of thin films
MEEN 451/657: Viscoelastic Solids and Structures I

Catalog Description:
Linear, viscoelastic mechanical property characterization methods, time-temperature equivalence, multiaxial stress-strain equations; viscoelastic stress analysis; the correspondence principle, approximate methods of analysis and Laplace transform inversion, special methods; static and dynamic engineering applications; nonlinear behavior.

Course Level: ☒ Undergraduate ☒ Graduate
Instructional Method: ☒ Traditional, face-to-face ☐ Web-based

Prerequisites: Graduate standing; CVEN 305 or equivalent

Textbook(s) and Supplemental Material

Grading

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<td>Final Exam</td>
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Learning Outcomes and/or Course Objectives
1. Apply balance laws of energy, linear and angular momenta to obtain governing equations for the viscoelastic responses of materials and structures under various boundary conditions
2. Understand the impact of viscoelastic materials and energy dissipation on the short- and long-term performance of materials and structures
3. Solve governing differential and integral equations using different approaches such as Laplace Transform, Fourier Transform and Convolution Integral
4. Characterize material parameters from experimental data
5. Analyze time-dependent response of structural components (trusses, beams, rods) under various loading and temperature histories

Course Topics
1. Spring-dashpot mechanical analog models
2. Experimental methods and material characterization
3. Design of viscoelastic structures
4. Advanced topics: Constitutive model for 3D responses of linear isotropic viscoelastic materials
5. Temperature effects on viscoelastic material behaviors
6. Introduction to nonlinear viscoelastic constitutive models
MEEN 459/659: Sound & Vibration Measurements

Catalog Description:
Basic acoustics, review of vibration theory, wave propagation in vibrating systems, sound radiation from vibrating systems, sound and vibration sensors and instrumentation, data acquisition systems, measurement techniques, spectral analysis, spatial FFT analysis, design of experiments with vibro-acoustic systems, and applications.

Course Level: ☒ Undergraduate ☑ Graduate

Instructional Method: ☐ Traditional, face-to-face ☒ Web-based

Prerequisites: Graduate standing; MEEN 363 and MATH 308 or equivalents

Textbook(s) and Supplemental Material:

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Learning Outcomes and/or Course Objectives:
To review the fundamentals of vibration analysis (SDOF and MDOF) as applied to lateral, torsional and axial displacements in mechanical structures, rotating in particular; to learn about measurement vibration techniques (time and frequency domain) and sensors, including calculation of uncertainty and variability for multiple I/O systems; experimental techniques for identification of system parameters using recorded data in the frequency domain; relationship between sound and vibration and calculation of sound wave propagation speed, etc.

At the end of this course students should be able to:
1. Apply Newton’s laws to derive equations of motion, 2D and 3D, of lumped parameter systems (SDOF and MDOF).
2. Identify the natural frequency, damped natural frequency, and damping factors for a SDOF system. Explain the effect of logarithmic decrement on the amplitude and decay speed of system response.
3. Derive the acoustic wave equation and understand plane wave propagations in air. Understand the dynamic response and wave propagation characteristics of various vibrating structures. Explain physical meaning of wave number, wave speed, and frequency and relations between these quantities.
4. Obtain the Frequency Response Function (FRF) for periodic excitations and explain the effects of system parameters and frequency on the amplitude of motion and phase lag. Use FRF for appropriate design considerations and reliable operation of vibrating systems.
5. Use Modal analysis to obtain the FRF of MODF systems (undamped and damped), explain the concept of mode shapes and natural frequencies, etc. Solve for free and forced motion responses of MDOF example using modal coordinates.
6. Apply spectral analysis techniques to process sound and vibration data.
7. Design and perform experiments for measuring sound and vibration data. Understand limits of vibration and effects of excessive vibration on the performance of rotating machinery. Able to explain and apply API criteria to the response of rotating machinery (lateral and torsional).
8. Write an effective report on sound and vibration measurements.
9. Gain working knowledge of vibration sensors and instrumentation utilized in rotating machinery industry. Ability to quantify measurement uncertainty and repeatability in time response measurements.
10. Gain knowledge on state of the art application for vibration and sound measurements (lasers, video, etc).
11. Use ubiquitous cheap sensors (in personal communication devices) to measure and track vibrations and sound.

Course Topics:
1. Basics of SDOF vibrations
2. Periodic forced response and uses of frequency response function
3. Review of masic MDOF vibrations
4. Instrumentation for vibration measurement
5. Rationale and principles of measurement
6. DFTs and vibrations
7. Field identification
8. Uncertainty and reliability
9. Vibrations in rotating machinery
10. Torsional vibrations
11. Vibration of continuum systems
12. Basic sound analysis
13. Instrumentation for sound measurement
MEEN 460/660: Corrosion Engineering

Catalog Description:
Aqueous corrosion phenomena of the mixed potential theory; basics of electrochemical reactions; corrosion measurement; surface engineering and protection; case studies.

Course Level: ☒ Undergraduate ☒ Graduate
Instructional Method: ☒ Traditional, face-to-face ☐ Web-based

Prerequisites: Graduate standing; MEEN 360, MEEN 475 or equivalents

Textbook(s) and Supplemental Material

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Learning Outcomes and/or Course Objectives
To develop an understanding of the physical principles of corrosion and control. Learn to apply those principles to design, problem solving, and technology development.

Course Topics:
1. Basics of corrosion
2. Forms of corrosion
3. Corrosion rate and testing
4. Electrode potentials and electrochemistry
5. Pourbaix Diagrams and electrochemical kinektids
6. Materials
7. Mineral acids
8. Environments
9. Corrosion protection
10. Battery test
11. Project presentation
MEEN 662: Energy Management in Industry

Catalog Description:
Energy systems and components frequently encountered in industrial environments; application of basic principles of thermodynamics, heat transfer, fluid mechanics and electrical machinery to the analysis and design of industrial system components and systems. Improved energy utilization.

Course Level: ☒ Undergraduate ☒ Traditional, face-to-face ☒ Graduate ☒ Web-based

Prerequisites: Graduate standing; MEEN 421 and MEEN 461 or equivalents

Textbook(s) and Supplemental Material:

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<td>D 60-69%</td>
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<td>F &lt;60%</td>
<td>Final Exam</td>
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Learning Outcomes and/or Course Objectives:
1. Describe best practices for industrial energy audits and energy management programs
2. Analyze Utility Rate Schedules and understand how a facility is being billed for their energy use
3. Describe the operation and common application of common industrial energy systems, including steam systems, compressed air systems, cooling systems, heating systems, motors, lighting, and power generation technologies
4. Identify common industrial energy recommendations, and calculate the associated energy and cost savings
5. Synthesize course concepts and techniques to conduct an energy audit of a manufacturing facility

Course Topics:
1. Energy management systems
2. Economic analysis
3. Utilities analysis
4. Electrical systems
5. Lighting
6. Motors and drives
7. Compressed air systems
8. Industrial control systems
9. Thermal systems
10. Steam systems
11. Waste heat management
12. Industrial cooling
13. Alternative energy and energy storage
14. Codes, standards, certifications, and careers
MEEN 463/663: Cogeneration Systems

Catalog Description:
Design and analysis of cogeneration systems; selection of prime mover-steam turbine, gas turbine, or reciprocating engine; environmental assessments; economic and financial evaluations; legal and institutional considerations; case studies.

Course Level: ☒ Undergraduate ☒ Graduate
Instructional Method: ☒ Traditional, face-to-face ☐ Web-based

Prerequisites: Graduate standing; MEEN 421 or equivalent

Textbook(s) and Supplemental Material:
1. Engineering Equation Solver (EES), F–Chart Software, Middleton, WI.
2. Instructor’s notes and supplementary reference material made available as needed.

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<td>Term Project 20%</td>
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<td>D 60-69%</td>
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<td>F 50-59%</td>
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Learning Outcomes and/or Course Objectives:
1. Describe basic cogeneration systems
2. Understand the application of steam turbines to cogeneration systems
3. Understand the application of internal combustion engines to cogeneration systems
4. Understand the application of gas turbines to cogeneration systems
5. Understand the application of electrical equipment to cogeneration systems
6. Understand and analyze the application of heat recovery devices to cogeneration systems
7. Understand and analyze the application of absorption chillers to cogeneration systems
8. Design a cogeneration system for a facility so as to satisfy power and thermal needs
9. Complete economic evaluations for proposed cogeneration systems
10. Understand financial options for funding cogeneration system development
11. Write technical reports both individually and within teams

Course Topics:
1. Basic Systems and Applications
2. Review of Thermodynamics, Fuels, Combustion
3. Prime Mover Overview
4. Steam Turbines (Rankine Cycles)
5. Gas Turbines (Brayton Cycles)
6. Reciprocating Engines (Otto and Diesel Cycles)
7. Electrical Equipment
8. Heat Recovery Devices
9. Absorption Chillers
10. Packaged Systems
11. Matching Power and Thermal Needs
12. Regulatory and Institutional Factors
13. Economics: Present Value Theory
14. Economics: Complete Evaluations
15. Financial Options
16. Contracts and Agreements
17. Computer Models
18. Project Development Process
19. Future of Cogeneration
MEEN 664: Energy Management in Commercial Buildings

Catalog Description:
Basic heating, ventilating and air conditioning system design/selection criteria for air conditioning and heat system and design/selection of central plant components and equipment.

Course Level: ☒ Graduate
☐ Undergraduate

Instructional Method: ☒ Traditional, face-to-face
☐ Web-based

Prerequisites: Graduate standing; MEEN 421 and MEEN 461 or approval of instructor

Textbook(s) and Supplemental Material:
2. Good HVAC textbook (no specific textbook assigned)
5. Heating, Ventilating and Air Conditioning Analysis and Design, Faye C. McQuiston, Jerald D. Parker and Jeffrey D. Spitler, 2019 or earlier editions.

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<td>C 70% - 79%</td>
<td>Project</td>
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<td>D 60% - 69%</td>
<td>Final Exam</td>
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<td>F &lt;60%</td>
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Learning Outcomes and/or Course Objectives:
1. Calculate the heating and cooling energy use of a commercial building using the ASHRAE Simplified Energy Analysis Procedure (SEAP)
2. Calculate the energy required by the four major types of air handling systems used in meeting zone loads in a building
3. Modify the calculation procedures used for the four major air handling systems to calculate the energy in meeting zone loads in a building to account for variations in AHU design
4. Write a complete air side simulation of a building using the SEAP in a spreadsheet
5. Calibrate the simulation written to the measured heating, cooling, and electric consumption data of a building

Course Topics:
1. Overview of energy issues around the world
2. Introduction to Continuous Commissioning®: Building energy performance overview, Background on energy calculations, Building load calculations for CC, Bin method energy calculations, Buildings as a Lumped Capacitance, Modified Bin Method, Zoning
3. System Components: Fans, Coils, Dampers, Valves
4. Single Duct Constant Air Volume Systems
5. Dual Duct Constant Volume Systems
6. Calibrating Simulations: Characteristic Signature Procedure for Calibration
7. HVAC Plants: Chillers, Cooling Towers, Boilers, Liquid Loops
8. HVAC Control Systems: Control Models, Control Hardware, System Examples, Optimizing Control Strategies
MEEN 665: Application of Energy Management

Catalog Description:
Basic heating, ventilating and air conditioning system design/selection criteria for air conditioning and heat system and design/selection of central plant components and equipment.

Course Level:  ☐ Undergraduate  ☑ Graduate  
Instructional Method:  ☑ Traditional, face-to-face  ☐ Web-based

Prerequisites:  Graduate standing; MEEN 662 and MEEN 664 or permission of instructor

Textbook(s) and Supplemental Material
1. ASHRAE Handbook series.

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Learning Outcomes and/or Course Objectives:
1. Conduct a preliminary evaluation of the potential energy savings in a commercial building based on use of gas and electric utility bills and basic building characteristics
2. Conduct a site visit to a building and based on several hours measuring performance and collecting information from mechanical rooms, provide a quantitative assessment of potential savings that could be expected from operational improvements in the building
3. Understand and be able to evaluate the savings to be expected from implementing common Continuous Commissioning® measures and other energy efficiency measures

Course Topics:
1. Introduction to Continuous Commissioning®
2. Fundamentals of Continuous Commissioning®
3. Introduction to CC® Software
4. CC® Assessments and Audits
5. Basic Continuous Commissioning® and Energy Efficiency Measures
6. CC® and Energy Efficiency Measures for AHU Systems
7. Tools and Equipment
8. Field Measurements
9. CC® Measures for Water/Steam Distribution
10. CC® and Energy Efficiency Measures for Chillers
11. CC® and Energy Efficiency Measures for Boilers
12. CC® Measures for Thermal Storage Systems
13. Verifying and Ensuring Optimum Building Performance
MEEN 433/667: Mechatronics

Catalog Description:
Mechatronics; logic circuits in mechanical systems; electrical-mechanical interfacing; analysis and applications of computerized machinery.

Course Level: ☒ Undergraduate ☒ Graduate Instructional Method: ☒ Traditional, face-to-face ☒ Web-based

Prerequisites: Graduate standing; ECEN 215, MEEN 260 and MEEN 364 or equivalents

Textbook(s) and Supplemental Material:
7. G. S. May and S. M. Sze (MS), Fundamentals of Semiconductor Fabrication, Chaps. 1 and 9, Wiley, 2001

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<td>Term Project</td>
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Learning Outcomes and/or Course Objectives:
At the end of this course, students will understand key contemporary issues in system integration with sensors, actuators and real-time controllers. Additionally, this course will cultivate students’ confidence in their capability to design a microcontroller-based mechatronic system.

1. Understand the state-of-the-art microcontroller structures and their applications
2. Understand basic working principles of active electronic devices, such as BJT, FET, CMOS and OP amp
3. Read and understand manufacturer’s data sheets
4. Design combinational and sequential digital logic circuits with off-the-shelf ICs
5. Build analog and digital interface
6. Develop working knowledge in key sensors and actuators and their applications
7. Design and implement simple digital controllers

Course Topics:
1. Semiconductor electronics
2. Bipolar-junction transistor (BJT) and applications
3. μC overview
4. Digital circuits
5. Combinational logic
6. C programming
7. Digital I/O and A/D
8. Sequential logic
9. Interrupts
10. Field effect transistor (FET)
11. Encoder
12. Logic gates and FFs
13. Large-scale IC
14. Position Sensors
15. 555 timer and OP amp
16. Specialty sensors
17. Electromechanical actuators
18. Sensors and actuators
19. Smart-material actuators
20. Analog signal processing
21. Discrete-time systems
22. PWF
23. Digital control
24. DC motor control
25. Real-time control
26. Mechatronic systems
MEEN 668: Rotordynamics

Catalog Description:
Teaches the phenomena which occur in rotordynamics of turbomachinery, modeling techniques for turbomachines, and analysis techniques for rotordynamics analysis of real machines.

Course Level:  □ Undergraduate  ☒ Graduate

Instructional Method:  ☒ Traditional, face-to-face  □ Web-based

Prerequisites:  Graduate standing

Textbook(s) and Supplemental Material:
1. *Turbomachinery Rotordynamics* with case studies by Dr. Childs

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Learning Outcomes and/or Course Objectives:
1. Develop an understanding of component and system rotordynamics models for turbomachinery
2. Develop an understanding of the physical phenomena displayed by the vibration characteristics of turbomachinery and be able to interpret both model predictions and measured output from real machines

Course Topics:
1. Linear vibrations 1DOF-2DOF
2. Structural dynamics, coupled lateral-torsional vibration
3. Jefferco-Föppl (F-P) model, fundamental concepts of rotor-bearing systems
4. Synchronous excitation; critical speed and spiral vibration; plane balancing
5. XLTRC2: rotor modeling, critical speed calculation, user interface, unbalanced response
6. Synchronous and parametric excitation: the Morton Effect, orthotropic rotors, cracked shafts, fractional frequency whirl
7. Rotor dynamic instabilities: dry friction whip, axial rubbing, the Stodola model, impact of rolling element clearances and nonlinear rotordynamic models
8. Bearings: hydrodynamic and ball bearings and their impact on rotordynamics
9. Bearings and dampers: numerical models, influence of flexible supports and support orthotropy; squeeze film dampers, softly-mounted rotor-bearing systms
10. Annular seals: liquid and annular seals and their influence on rotordynamics
11. System modeling: rotor-bearing system stability and synchronous response analysis, API stability analysis
12. Oil free turbomachinery: oil free bearings, state of the art rotordynamic challengers and applications
MEEN 469/669: Alternative Energy Conversion

Catalog Description:
Design and analysis of alternative energy conversion processes and systems based on converting energy directly (e.g. fuel cells, photovoltaics); utilizing non-combustible heat sources (e.g. geothermal, ocean gradients, solar, and nuclear fission and fusion); obtaining energy from the environment (e.g. wind, hydroelectric, ocean tides and waves).

Course Level: ☒ Undergraduate ☒ Graduate
Instructional Method: ☒ Traditional, face-to-face ☐ Web-based

Prerequisites: Graduate standing

Textbook(s) and Supplemental Material:
No assigned text. Students will utilize instructor notes, contemporary literature/publications and the internet as directed.

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Learning Outcomes and/or Course Objectives:
1. Apply the general energy and mass conservation equations to a wide variety of alternative energy conversion processes and systems
2. Formulate and apply assumptions to real-world alternative energy conversion technologies for the purpose of developing mathematical models for design and analysis
3. Perform alternative energy engineering calculations with an understanding of their accuracy and relationship to the real-world of energy engineering
4. Provide a conceptual understanding of a wide range of alternative energy conversion technologies to include precise knowledge of processes, components and systems that comprise each technology
5. Quantify the potential that each individual alternative energy conversion technology has for contributing to reductions in fossil-fuel use while at the same time appreciating the limitations and challenges that must be addressed for real-world applications

Course Topics:
1. Principles of energy conversions
2. Fossil fuels and the environment
3. Solar energy basics
4. Solar energy for power production
5. Fuel cells and the hydrogen economy
6. Electric and hybrid cars
7. Wind power production
8. Power production from nuclear fission and fusion processes
9. Geothermal energy conversion and production
10. Hydroelectric energy production – lakes and rivers
11. Ocean waves, tidal and thermal energy
12. Biomass energy production and use
13. Energy storage technologies
14. Advanced energy concepts
15. Evaluation and comparison of technologies
MEEN 672: Introduction to Finite Method

Catalog Description:
Weak or variational formulation of differential equations governing one- and two- dimensional problems of engineering; finite element model development and analysis of standard problems of solid mechanics (bars, beams, and plane elasticity), heat transfer and fluid mechanics; time-dependent problems; computer implementation and use of simple finite element codes in solving engineering problems.

Course Level: ☐ Undergraduate ☑ Graduate

Instructional Method: ☑ Traditional, face-to-face ☐ Web-based

Prerequisites: Graduate standing; MEA 647/MEEN 670

Textbook(s) and Supplemental Material:

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Grading Scale:
A 90-100%
B 80-89%
C 70-79%
D 60-69%
F <60%

Grading:

Learning Outcomes and/or Course Objectives
Students will be able to apply the advanced theoretical concepts and principles necessary for the application of the finite element method in the solution of differential equations in engineering.

Course Topics:
1. Integral Formulations and Variational Methods
2. Basic Steps of Finite Element Analysis (FEA)
3. FEA of One-Dimensional Problems
4. Numerical Integration and Computer Implementation
5. FEA of Two-Dimensional Problems
6. Finite Element Error Analysis
MEEN 673: Nonlinear Finite Element Analysis

Catalog Description:
Tensor definitions of stress and strain, finite strain, geometric and material nonlinearities; development on nonlinear finite element equations from virtual work; total and updated Lagrangian formulations; solution methods for nonlinear equations; computational considerations; applications using existing computer programs.

Course Level:  ☒ Graduate  ☐ Undergraduate
Instructional Method:  ☒ Traditional, face-to-face  ☐ Web-based

Prerequisites:  Graduate standing; MEMA 647/MEEEN 670

Textbook(s) and Supplemental Material:

Grading:

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Learning Outcomes and/or Course Objectives:
1. Study nonlinear finite element formulations and computer implementation of problems from heat transfer, solid and structural mechanics, and flows of viscous incompressible fluids.
2. Provide both formulative and computational tools necessary to solve 1-D and 2-D linear and nonlinear problems of heat transfer, fluid mechanics, and solid mechanics.
3. Experience gained should allow formulation and analysis of other field problems of engineering and applied science

Course Topics:
MEEN 678: Aerosol Mechanics

Catalog Description:
Provides the basis for understanding and modeling aerosol behavior; mechanical, fluid dynamical, electrical, optical and molecular effects are considered; applications include sprays and atomization, aerosol collection, aerosol sampling and visibility.

Course Level: ☑ Graduate
☐ Undergraduate
Instructional Method: ☑ Traditional, face-to-face
☐ Web-based

Prerequisites: Graduate standing or approval of the instructor

Textbook(s) and Supplemental Material:
4. Smoke, Dust and Haze, by S. Friedlander, John Wiley & Sons

Grading:

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<td>D 61-70%</td>
<td>Take-Home Exam 15%</td>
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Learning Outcomes and/or Course Objectives:
1. To explain and calculate the statistics of a given particle size distribution.
2. To determine the movement of aerosols by a given transport mechanics (inertial movement, diffusion, electrical migration and thermophoresis) and analyze the important mechanisms for a given aerosol system.
3. To calculate the optical properties of a given aerosol system.
4. To derive expressions for a given aerosol system involving multiple aerosol mechanisms (nucleation, condensation, coagulation, diffusion) and analyze the dynamics of the particle size distributions.
5. To design a system to generate, to collect aerosols and to measure particle size distribution.
6. To explain the multi-disciplinary aspects of aerosol science & technology.
7. To explain aerosol science & technology to the professional society and general public.

Course Topics:
1. Particle Size
2. Particle Size Distribution
3. Single Particle Motion
4. Diffusion
5. Thermophoresis
6. Filtration
7. Electrical behavior
8. Optical behavior
9. Nucleation
10. Coagulation
11. Condensation
12. Selected special topics (aerosol generation, aerosol instrumentation, atmospheric aerosol, respiratory deposition, health related aerosol, bioaerosol)
MEEN 680: Optical Techniques for Engineers

Catalog Description:
Basic optical theories and their practical applications with an emphasis on flow visualization for thermal and fluid engineering; operating principles and applications of at least seven different optical diagnostic instruments.

Course Level: ☑ Graduate
Instructional Method: ☑ Traditional, face-to-face

Prerequisites: Graduate standing

Textbook(s) and Supplemental Material:

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<td>B 80-89%</td>
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<td>C 70-79%</td>
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Learning Outcomes and/or Course Objectives:
This course covers basics of geometrical and physical optics with an emphasis on topics that often arise in multidisciplinary engineering applications. Certain topics areas are covered in depth, while others are treated in a survey fashion to broaden the knowledge base. Specific objectives of the course are to provide the student with an understanding of, i) basic optical phenomena, ii) calculation methods for optical design and analysis, iii) descriptions and applications of important optical elements, and iv) integration of above topics to successfully design optics related experiments and instrumentation.

Course Topics:
1. Introduction
2. Geometrical Optics
3. Imaging Elements
4. Matrix Methods
5. Optical Instruments & Aberrations
6. Fiber Optics and Optical Devices
7. Introduction to Physical Optics
8. Fresnel Equations
9. Interference of Light
10. Polarization
11. Diffraction
12. Lasers and Laser Characteristics, Optical Detectors
13. Introduction to Laser-Based Measurements
14. Project Presentations
MEEN 683: Multidisciplinary System Analysis and Design Optimization

Catalog Description:
Overview of principles, methods and tools in multidisciplinary system analysis and design optimization; engineering systems modeling for analysis, design and optimization; design variable selection, objective functions and constraints; subsystem identification and interface design; gradient-based and heuristic search methods; multi-objective optimization and Pareto optimality.

Course Level: ☐ Undergraduate ☒ Graduate

Instructional Method: ☒ Traditional, face-to-face
☐ Web-based

Prerequisites: Graduate standing

Textbook(s) and Supplemental Material:
None

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<tr>
<td>Final Project Report</td>
<td>20%</td>
</tr>
<tr>
<td>Active Participation &amp; Attendance</td>
<td>10%</td>
</tr>
</tbody>
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Learning Outcomes and/or Course Objectives:
1. Learn how MSADO can support the product development process of complex, multidisciplinary engineered systems.
2. Learn how to rationalize and quantify a system architecture or product design problem by selecting appropriate objective functions, design parameters, and constraints.
3. Subdivide a complex system into smaller disciplinary models, manage their interfaces, and reintegrate them into an overall system model.
4. Be able to use gradient-based numerical optimization algorithms, e.g., sequential quadratic programming and various modern heuristic optimization techniques such as simulated annealing or genetic algorithms and select the ones most suitable to the problem at hand.
5. Perform a critical evaluation and interpretation of analysis and optimization results, including sensitivity analysis and exploration of performance, cost, and risk tradeoffs.
6. Be familiar with the basic concepts of multiobjective optimization, including the conditions for optimality and Pareto front computation techniques.
7. Sharpen presentation skills, acquire critical reasoning with respect to the validity and fidelity of MSADO models and experience the advantages and challenges of teamwork.

Course Topics:
1. System characterization
2. Subsystem model development
3. Optimization and exploration techniques
4. Sensitivity and post-optimality analysis
5. Multiobjective optimization
6. Introduction to design under uncertainty
7. System assessment and extensions
8. Implementation issues
9. Problem formulation
10. Modeling and simulation
11. Unconstrained, constrained and numerical optimization
12. Problem decomposition
13. Design space exploration
14. Simulated annealing
15. Genetic algorithms
16. Goal programming/isoperformance
17. Post-optimality analysis
18. Multifidelity methods
Catalog Description:
Machining theory; traditional and non-traditional machining processes; CNC machines and tools; geometric dimensioning and tolerance (GD&T); additive manufacturing systems and processes; materials in additive manufacturing.

Course Level: ☒ Undergraduate ☒ Traditional, face-to-face
☒ Graduate ☐ Web-based

Prerequisites: Graduate standing; MEEN 361 & MEEN 360 or equivalent

Textbook(s) and Supplemental Material:

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<tr>
<td>A</td>
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<td>B</td>
<td>Team Project 25%</td>
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<td>C</td>
<td>Participation 5%</td>
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<td>D</td>
<td>Exams 50%</td>
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Learning Outcomes and/or Course Objectives:
1. Ability to apply knowledge of mathematics, science and engineering
2. Ability to design a system, component, or process to meet desired needs within realistic constraints such as economic, environmental, social, political, ethical, health and safety, manufacturability, and sustainability
3. Ability to identify, formulate and solve engineering problems
4. Ability to communicate effectively
5. Ability to use the techniques, skills and modern engineering tools necessary for engineering practice

Course Topics:
1. Traditional machining
2. Machining automation
3. Advanced machining
4. Tolerancing
5. Polymer-based AM
6. Polymer/ceramics/metals AM
7. AM innovation
8. Project presentations
MEEN 688: Advanced Solid Mechanics

Catalog Description:
Derive approximate solutions of engineering mechanics problems by using suitable assumptions; understand the nature of the approximations and their effects on the accuracy of the resulting mechanics-of-materials solutions; apply the principles of advanced mechanics of materials to analyze deformation and failure problems common in engineering design and materials science; prepare for success in more advanced mechanics courses such as elasticity, energy methods, continuum mechanics and plasticity.

Course Level: ☑ Graduate
Instructional Method: ☑ Traditional, face-to-face

Prerequisites: Graduate standing; Mechanics of Materials (CVEN 305), or equivalent, advanced calculus, differential equations

Textbook(s) and Supplemental Material:

Grading:

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<td>B 80-89%</td>
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<td>C 70-79%</td>
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Learning Outcomes and/or Course Objectives:
At the end of this course, students should be able to:
1. Determine response of structural members undergoing extensional, bending and twisting deformations
2. Understand response of materials and structures subject to various loading histories
3. Analyze response of structural members (bars, beams, plates) with coupled axial, bending, and twisting
4. Analyze response of structural members with field coupling effect (hygro-thermal, thermo-mechanical, and electro-mechanical)
5. Set-up governing equations for deformation in structures
6. Use energy methods to calculate deformations and stresses in multifunctional structures
7. Use differential equations, integral equations, and correspondence principle
8. Use analytical and numerical methods to solve differential equations
Course Topics:
1. Introduction to constitutive equations for materials with coupled mechanical and non-mechanical effects: hygro-thermal, electro-mechanical (linear response).
2. Bending and shearing problems (BS): un-symmetric bending and shear center in beams
3. BS: shear center in beams, plate bending, Kirchhoff-Love theory
4. BS: thermal stress during steady and unsteady heat (or moisture) diffusions
5. BS: piezoelectric stacked actuators (composite beams), bending of piezoelectric beams
6. Problems in polar coordinates: thick-walled pressure vessels, e.g. heat conduction and deformation, shrink-fit
7. Curved beams, thin-walled open and closed sections
8. Torsion in noncircular cross-sections: St. Venant theory, Prandt stress function
9. Warping: thin-walled open section
10. Energy method for problems with field coupling effects (thermo-electro-mechanical), application of Castigliano’s theorem
11. Energy method (con’t). Introduction to large deformation theory
12. Constitutive equations for nonlinear elastic materials
13. Problems in non-linear elasticity (extension, torsion, radial expansion, etc.)
14. Problems in large deformations of flexible beams (folding/rolling) and membranes under mechanical stimulus.
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APPENDIX E. MULTI-YEAR COST-SHARING FUNDING PACKAGES

COLLEGE OF ENGINEERING
J. Mike Walker ’66 DEPARTMENT OF MECHANICAL ENGINEERING

Dr. Ying Li
Director, Mechanical Engineering Graduate Program
Associate Professor

MEMORANDUM

TO: Mechanical Engineering Faculty

FROM: Dr. Ying Li
Associate Professor and Graduate Program Director

DATE: 2019.02.07

SUBJECT: Mechanical Engineering Graduate Merit Fellowship (FY 2019 – 2020) – Updated

Dear Colleagues:

The J. Mike Walker ’66 Department of Mechanical Engineering is pleased to announce the following departmental graduate fellowship opportunity to target prospective Fall 2019 students.

Fellowship Name: Mechanical Engineering Graduate Merit Fellowship

Goal: To help recruit top domestic graduate students, female (including international), and underrepresented minority students (new graduate students only, including TAMU BS/MS students pursuing graduate degrees)

Type and Funding Level:

Mechanical Engineering Graduate Merit Fellowship I: 3 year funding package for PhD students (5 ~ 10)

Mechanical Engineering Graduate Merit Fellowship II: 1 year funding package for PhD students (5 ~ 10)

Mechanical Engineering Graduate Merit Fellowship III: 1.5 year funding package for MS students (up to 5; priorities are domestic female and underrepresented minorities)

How to Apply: Faculty nominates student candidates (from the admitted student pool) to the Director of Graduate Programs (Dr. Ying Li: yingleh@tamu.edu) and indicates the type of Fellowship. The qualification of the student candidate will be evaluated by the Graduate Office. If selected, an offer letter including the fellowship and GAR/GAT funding will be generated by the Graduate Office and sent to the student. While there is no limit how many students a faculty can nominate, distribution of the fellowship to different faculty groups will be considered. There is no deadline for application and will be considered until the fellowship funds are exhausted.

396 | P a g e
1. Mechanical Engineering Graduate Merit Fellowship I (PhD Students)
   - **Guaranteed 3 year funding** in GAR (or GAT as backup); minimum $2,000/mo stipend, tuition and allowable fees paid, plus **$7,000 fellowship** in the first year. The stipend for GAT is $2,000/mo or $9,000 per semester; GAR stipend could be higher (up to the faculty advisor). GAT is not available for summer.
   - The student needs to identify a faculty advisor to receive the fellowship. Faculty advisor is expected to fund the student by GAR throughout the PhD studies; in case that GAR funding is not available, the department may contribute up to two semesters GAT (not consecutively in the first two semesters) **during the first 3 year period**. When supported by GAT, the student’s tuition and allowable fees will be covered by the department. Departmental GAT funding beyond year 3 is not guaranteed.
   - Student maintaining a GPA above 3.5 or demonstrating excellent research performance will qualify for **$4,000 fellowship and $750 travel award per year** for the following years in their PhD studies.
   - Student passing PhD **qualifier exam** will receive an additional **$2,000 fellowship**. Student passing PhD **preliminary exam** will receive an additional **$2,000 fellowship**.
   - Student may be eligible for other departmental endowed fellowship or scholarship awards if demonstrating outstanding academic and research performance.

2. Mechanical Engineering Graduate Merit Fellowship II (PhD Students)
   - **Guaranteed 1 year funding** in GAR (or GAT as backup); minimum $2,000/mo stipend, tuition and allowable fees paid, plus **$5,000 fellowship** in the first year. The stipend for GAT is $2,000/mo or $9,000 per semester; GAR stipend could be higher (up to the faculty advisor). GAT is not available for summer.
   - The student needs to identify a faculty advisor to receive the fellowship. Faculty advisor is expected to fund the student by GAR throughout the PhD studies; in case that GAR funding is not available, the department may contribute up to one semester GAT **during the first year period**. When supported by GAT, the student’s tuition and allowable fees will be covered by the department. Departmental GAT funding beyond year 1 is not guaranteed.
   - Student maintaining a GPA above 3.5 or demonstrating excellent research performance will qualify for **$4,000 fellowship and $750 travel award per year** for the following years in their PhD studies.
   - Student passing PhD **qualifier exam** will receive an additional **$2,000 fellowship**. Student passing PhD **preliminary exam** will receive an additional **$2,000 fellowship**.
• Student may be eligible for other departmental endowed fellowship or scholarship awards if demonstrating outstanding academic and research performance.

3. Mechanical Engineering Graduate Merit Fellowship III (MS Students)

• **Guaranteed 1.5 year (three long semesters) funding** in GAR (or GAT as backup); minimum $2,000/mo stipend, tuition and allowable fees paid, plus **$2,000 fellowship** in the first year. The stipend for GAT is $2,000/mo or $9,000 per semester; GAR stipend could be higher (up to the faculty advisor). GAT is not available for summer.

• The student needs to identify a faculty advisor to receive the fellowship. Faculty advisor is expected to fund the student by GAR in the first 1.5 years; in case that GAR funding is not available, the department **may contribute up to one semester GAT during the first 1.5 year period**. When supported by GAT, the student’s tuition and allowable fees will be covered by the department. Departmental GAT funding beyond 1.5 year is not guaranteed.

• Student maintaining a GPA above 3.5 or demonstrating excellent research performance will qualify for **$500 travel award in their 2nd year** of MS studies.

• Student may be eligible for other departmental endowed fellowship or scholarship awards if demonstrating outstanding academic and research performance.
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APPENDIX F. GRADUATE STUDENT ASSESSMENT

Texas A&M Mechanical Engineering Graduate Assessment Procedure
(Revision 09.18.18)

Summary

This document is an overview of the educational assessment process for the Mechanical Engineering Graduate Program at Texas A&M University. Included is an overview of metrics and assessment rubrics. Also included is portfolio preparation instructions for students and assessment guidelines for the committees that perform the assessment. This document provides assessment execution instructions for both students and faculty. An appendix includes the assessment rubric forms.

1. Preface

TAMU Mechanical Engineering performs a high level educational assessment of all students in the graduate program. This assessment is used to provide feedback to the graduate program and department faculty to understand the educational outcome of our program and improve it as needed. The educational assessment is also used as part of the program accreditation process.

The assessment measures 5 high level educational goals of the graduate program. The goals are assessed using a grading rubric. Each student prepares a portfolio of graded work from their curricular study at Texas A&M that contains content that can be used to perform the assessment.

The portfolio is provided to the student’s research committee in the case of Master of Science (M.S.) and Doctor of Philosophy (Ph.D.) students. The research committee performs the final assessment for M.S. and Ph.D. students. The Mechanical Engineering Graduate Program office will not process the final thesis/dissertation approval forms for students until a completed portfolio is submitted.

For Master of Engineering (M. Eng.) students, the portfolio is provided to the Graduate Program Director. The Graduate Studies and Research Committee (GSRC) performs the final assessment for M. Eng. students.

2. Educational Outcome Assessments

The assessed educational goals of TAMU MEEN Graduate Program are:

A. Graduates will have the ability to apply knowledge of mathematics, science, and engineering
B. Graduates will have the ability to identify, formulate, and solve engineering problems
C. Graduates will have the ability to communicate effectively
D. Graduates will have knowledge of contemporary issues and recognition of the need for lifelong learning
E. Graduates will have the ability to use the techniques, skills, and modern engineering tools necessary for engineering practice

These outcomes are assessed using a 3-point scale assessment rubric. The three points are:

1) Exceeds Expectations
2) Meets Expectations
3) Below Expectations

Also included is a Not Observable category. Not observable scores occur only in special cases. Students are expected to provide work showing observable accomplishments directly related to each goal.

3. Assessment Rubrics (Committee and Student Self-Assessment)

Five Educational Outcomes or Goals:

1. (A) Graduates will have the ability to apply knowledge of mathematics, science, and engineering.

   **Exceeds Expectations**
   Applies correct mathematical, scientific, and engineering concepts with no conceptual or procedural errors affecting the problem solution.

   **Meets Expectations**
   Applies correct mathematical, scientific, and engineering concepts; solution is conceptually correct but contains minor procedural errors.

   **Below Expectations**
   Applies incorrect mathematical, scientific, and engineering concepts or solution contains conceptual or procedural errors affecting the problem solution.

2. (B) Graduates will have the ability to identify, formulate, and solve engineering problems.

   **Exceeds Expectations**
   Can relate theoretical concepts to practical problem solving; uses appropriate resources to locate information needed to solve problems; takes new information and effectively integrates it with previous knowledge; demonstrates understanding of how various pieces of the problem relate to each other and the whole; formulates strategies for solving problems; the answer is correct and properly labeled; the solution is correct and checked in other ways when it can be; the solution interpretation is appropriate and makes sense.

   **Meets Expectations**
   Connects theoretical concepts to practical problem-solving when prompted; uses limited resources to solve problems; must be assisted in integrating previous knowledge and new information; is missing some of the pieces of the whole problem; has some strategies for problem-solving, but does not apply them consistently; the answer is nearly correct, but properly labeled (within reasonable and logical range of the correct answer-it's in the ballpark); the solution is correct, but not checked in other ways.

   **Below Expectations**
   Does not see the connection between theory and practical problem solving; uses no resources to solve problems; has no concept of how previous knowledge and new information relate; does not realize when major components of the problem are missing; has no coherent strategies for problem solving; the answer is incorrect and not checked for its reasonableness; no attempt at checking the obviously incorrect solution; no solution interpretation.
3. (C) Graduates will have the ability to communicate effectively.

**Exceeds Expectations**
Purpose and main ideas are exceptionally focused, clear, and interesting. Order and structure are compelling and move the audience through easily. Main ideas are well developed by strong support and rich details. When appropriate, use of outside sources provides strong, credible support. Voice is appropriate for topic, purpose, and audience. Wording is fresh and specific, with a striking and varied vocabulary. Sentences are highly crafted, with varied structure that makes understanding easy and enjoyable. Communication demonstrates strong control of standard conventions and uses them well to enhance communication. Very few or no errors. Documentation is meticulous.

**Meets Expectations**
Communication is clear and focused. Audience can easily understand the purpose and main ideas. Order and structure are clear and easy to follow. The main ideas are well developed by supporting details. When appropriate, use of outside sources provides credible support. Voice is generally appropriate for topic, purpose, and audience. Generally, wording conveys message in an interesting, precise, and natural way. Sentences are carefully crafted with variations in structure. Student demonstrates control of standard communication conventions and uses them effectively to enhance communication. Few errors. Documentation is correct except for a few errors.

**Below Expectations**
Communication lacks focus. Purpose and main ideas are unclear and require extensive inferences from the audience. Communication lacks organizational structure or is too short to demonstrate organizational skills. Development is insufficient. Most supporting details are irrelevant or repetitious. Voice is inappropriate for topic, purpose, and audience. Wording is incorrect and detracts from meaning. Overall, sentences are choppy, rambling, and awkward. Errors often impede understanding. Documentation is not present.

4. (D) Graduates will have knowledge of contemporary issues and recognition of the need for lifelong learning.

**Exceeds Expectations**
Defines and discusses various concepts of lifelong learning and the need for it. Applies these concepts to their own learning now and in the future. Demonstrates self-awareness by accurately identifying strengths/weaknesses in their own ability to learn independently. Gives relevant example(s). Deep understanding of the immediate and long-term implications. Articulately expresses arguments from several viewpoints including the historical perspective.

**Meets Expectations**
Defines and discusses at least one concept of lifelong learning and the need for it. Applies concept and gives an example related to their own learning. Good understanding of many contemporary issues. Understands and can express more than one viewpoint.

**Below Expectations**
Fails to identify the need for lifelong learning and/or omits discussion of their own learning and relevant examples. Little or no understanding (or interest) of contemporary issues. Unable to put forth more than one side to an issue.

5. (E) Graduates will have the ability to use the techniques, skills, and modern engineering tools necessary for engineering practice.

**Exceeds Expectations**
Skilled at word processing and spreadsheet use. Skilled with other programs and able to write long, intricate programs. Able to direct others in drawing preparation and checking. Skilled at modeling and related analysis. Has a broad understanding of manufacturing methods. Able to manage others in a group that can design parts easily manufactured using an appropriate manufacturing method.

**Meets Expectations**
Able to use word processors and spreadsheets to produce well formatted reports. Able to use other programs and write computer programs. Able to use engineering tools relevant to their specialty with minimal supervision. Able to develop computer models and use for analysis. Understands basic manufacturing methods and can design parts that are easily manufacturable.

**Below Expectations**
Marginal ability with word processor and spreadsheet use. Struggles with other programs and programming. Able to use engineering tools relevant to their specialty with close supervision. Marginal understanding of technical communication methods such as drawings, dimensioning, and tolerancing as related to their specialty. Has little or no understanding of manufacturing processes and their strengths/weaknesses.

4. Portfolio Preparation

Students will prepare a portfolio for assessment. The portfolio will be compiled over the student’s course of study at Texas A&M University. In general, the portfolio will consist of graded materials from classes or research activity that can be evaluated and assessed against the Five Educational Outcome or Goal Assessments (A) through (E) outlined in “3. Assessments Rubrics” above. The portfolio should be contained in a 3 ring binder and contain six tabs labeled “0”, “A”, “B”, “C”, “D”, and “E”.

**M. Eng.** students will need to build the portfolio over their course of study as appropriate work samples are produced in various classes.

It is strongly recommended that **M.S. and Ph.D.** students producing a thesis or dissertation as part of their degree requirements use elements of that work or related research papers as the items used for assessment. Students orally defending their thesis/dissertation are encouraged to use that presentation as the assessment media for Educational Outcome C. Also, the Conclusions and Future Work (or similar) section of their thesis/dissertation is likely example work for assessing Educational Outcome D.

**A. Outside Title Page**
The front of the portfolio should be clearly titled “Graduate Assessment Portfolio” which includes the student’s full legal name, student’s UIN, program, graduation term, and the names of the student’s research advisory committee as needed.

B. **Inside Title Page**

This first page inside of the portfolio is the title sheet titled “Educational Outcome Assessment” which includes the student’s full legal name, student’s UIN, program, graduation term, and Aggie Honor Code statement, and student’s signature.

C. **Table of Contents**

The table of contents consists of 6 sections titled as follows:

- Front Matter and Assessments
- Ability to Apply Knowledge of Mathematics, Science, and Engineering
- Ability to Identify, Formulate, and Solve Engineering Problems
- Ability to Communicate Effectively
- Knowledge of Contemporary Issues and Recognition of the Need for Lifelong Learning
- Ability to Use the Techniques, Skills, and Modern Engineering Tools Necessary for Engineering Practice

D. **Tab 0** contains 3 items:

1. The first item is an **unofficial copy of the student’s transcript** for the degree they are completing.
2. The second item is a completed and signed **Committee Assessment Rubric** form.
3. The third item is a **Student Self-Assessment Rubric** form completely filled out by the student including the student’s own self-assessment scoring on the rubric.

E. **Tab A** contains 2 items:

1. The 1st item is one page containing the student’s self-assessment scoring of their ability to apply knowledge of mathematics, science, and engineering and a short defense of that assessment rank. A one-sentence statement of “My ability to apply knowledge of mathematics, science, and engineering (exceeds/meets/is below) the expectations of the Mechanical Engineering Graduate Program at Texas A&M University.” Below that sentence is a brief description and justification of how the example work beginning on the following page (item 2 in Section A) illustrates and justifies the specific rank (exceed/meets/is below) and applies to the specific Educational Outcome. This statement should be brief. It is recommended that the student take the above scoring guidelines, cut and paste them into the document, and then explain how the example work to follow “applies correct mathematical, scientific, and engineering concepts with no conceptual or procedural errors affecting the problem solution” and similar for each educational outcome and assessment.

2. The 2nd item in Section A is example work taken from work done at Texas A&M for the student’s degree. This example work could be a test, a report for a class, a portion of research, a research paper, a class project, or similar. Any work performed by the student can be used. In the case of a multi-author research paper, the student needs to be first author. The student is encouraged to highlight and annotate the work showing specific examples related to the educational outcome being assessed and the specific rubric scoring guidelines from above.

Sections B through E are equivalent to Section A with the modification that they contain the student’s self-assessment and example work for educational outcomes B through E.
In some cases, **Educational Outcome C** may be assessed on an oral presentation. The oral presentation could be the student’s thesis or dissertation defense or an oral presentation in a class. In these cases, item two in Section C should state “Oral Presentation” and provide the title, date and the nature of the presentation (“Gear Train Redesign”, Final Presentation in MEEN 6XX on Dec. 1, 20## for example). In the case of an oral presentation, the portion of the rubric related to outcome C needs to be completed at the time of the presentation by the course instructor who is grading the presentation or by the research advisory committee. The assessor needs to print their name, sign their name, complete, and date the rubric. This completed rubric is included in the portfolio in Section C.

### 5. Portfolio Preparation and Submission Process

Students should compile the portfolio over their course of study at Texas A&M University. Portfolios for Master of Science (M.S.) and Doctor or Philosophy (Ph.D.) students, who are preparing a thesis or dissertation, will be assessed by their research advisory committee. The M.S. and Ph.D. students will provide the assessment portfolio to their committee when they circulate the final thesis or dissertation to the committee for review. It is expected that the research advisory committee will complete the assessment of the student’s work at the defense. One fully completed assessment portfolio is turned into the Mechanical Engineering Graduate Program Office after the final defense.

Master of Engineering (M.Eng.) students will turn a completed, with the exception of the GSRC committee assessment, portfolio to the Mechanical Engineering Graduate Program Office. The final assessment of that student’s work will be performed by the Graduate Studies and Research Committee (GSRC). M. Eng. students will submit the graduate assessment portfolio to the Graduate Program Office by the 10th week of the long semester in which they plan to graduate or the 6th week of the summer semester if graduating in summer.

### 6. Appendix

- Assessment Rubric (GSRC Committee) [2-pages] – Master of Engineering
- Assessment Rubric (Advisory Committee) [2-pages] – Master of Science & Doctor of Philosophy
- Assessment Rubric (Student Self-Assessment) [2 pages]
### Educational Assessment Process, TAMU MEEN

#### Appendix: Assessment Rubric (Student Self-Assessment)

<table>
<thead>
<tr>
<th>Educational Outcome or Goal</th>
<th>Exceeds Expectations</th>
<th>Meets Expectations</th>
<th>Below Expectations</th>
<th>Not Observable</th>
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<tr>
<td><strong>(A) Graduates will have the ability to apply knowledge of mathematics, science, and engineering.</strong></td>
<td>Applies correct mathematical, scientific, and engineering concepts with no conceptual or procedural errors affecting the problem solution.</td>
<td>Applies correct mathematical, scientific, and engineering concepts; solution is conceptually correct but contains minor procedural errors.</td>
<td>Applies incorrect mathematical, scientific, and engineering concepts or solution contains conceptual or procedural errors affecting the problem solution.</td>
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<tr>
<td>Exceeds expectations</td>
<td>Can relate theoretical concepts to practical problem solving; uses appropriate resources to locate information needed to solve problems; takes new information and effectively integrates it with previous knowledge; demonstrates understanding of how various pieces of the problem relate to each other and the whole; formulates strategies for solving problems; the answer is correct and properly labeled; the solution is correct and checked in other ways when it can be; the solution interpretation is appropriate and makes sense.</td>
<td>Connects theoretical concepts to practical problem solving when prompted; uses limited resources to solve problems; must be assisted in integrating previous knowledge and new information; is missing some of the pieces of the whole problem; has some strategies for problem-solving, but does not apply them consistently; the answer is nearly correct, but properly labeled (within reasonable and practical range of the correct answer, it's in the ballpark); the solution is correct, but not checked in other ways.</td>
<td>Does not see the connection between theory and practical problem solving; uses no resources to solve problems; has no concept of how previous knowledge and new information relate; does not realize when major components of the problem are missing; has no coherent strategies for problem solving; the answer is incorrect and not checked for its reasonableness; no attempt at checking the obviously incorrect solution; no solution interpretation.</td>
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<td>Meets expectations</td>
<td>Purpose and main ideas are exceptionally clear and interesting. Order and structure are compelling and move the audience through easily. Main ideas are well developed by strong and rich details. When appropriate, use of outside sources provides strong, credible support. Voice is appropriate for topic, purpose, and audience. Word choice is fresh and specific, with a striking and varied vocabulary. Sentences are highly crafted, with varied structure that makes understanding easy and enjoyable. Communication demonstrates strong control of standard conventions and uses them well to enhance communication. Very few errors or no errors. Documentation is meticulous.</td>
<td>Communication is clear and focused. Reader can easily understand the purpose and main ideas. Order and structure are clear and easy to follow. The main ideas are well developed by supporting details. When appropriate, use of outside sources provides credible support. Voice is generally appropriate for topic, purpose, and audience. Generally, wording conveys message in an interesting, precise, and natural way. Sentences are carefully crafted with variations in structure. Student demonstrates control of standard communication conventions and uses them effectively to enhance communication. Few errors. Documentation is correct except for a few errors.</td>
<td>Communication lacks focus. Purpose and main ideas are unclear and require extensive inferences from the audience. Communication lacks organizational structure or is too short to demonstrate organizational skills. Development is insufficient. Most supporting details are irrelevant or repetitive. Voice is inappropriate for topic, purpose, and audience. Word choice is incorrect and detracts from meaning. Overall, sentences are choppy, rambling, and awkward. Errors often impede understanding. Documentation is not present.</td>
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## Appendix: Assessment Rubric (Student Self-Assessment)

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<th>Meets Expectations</th>
<th>Below Expectations</th>
<th>Not Observable</th>
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<td>(D) Graduates will have knowledge of contemporary issues and recognition of the need for lifelong learning.</td>
<td>Defines and discusses various concepts of lifelong learning and the need for it. Applies these concepts to their own learning now and in the future. Demonstrates self-awareness by accurately identifying strengths/weaknesses in their own ability to learn independently. Gives relevant examples. Deep understanding of the immediate and long term implications. Articulately expresses arguments from several viewpoints including the historical perspective.</td>
<td>Defines and discusses at least one concept of lifelong learning and the need for it. Applies concept and gives an example related to their own learning. Good understanding of many contemporary issues. Understands and can express more than one viewpoint.</td>
<td>Fails to identify the need for lifelong learning and/or omits discussion of their own learning and relevant examples. Little or no understanding (or interest) of contemporary issues. Unable to put forth more than one side to an issue.</td>
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<td>(E) Graduates will have the ability to use the techniques, skills, and modern engineering tools necessary for engineering practice.</td>
<td>Skilled at word processing and spreadsheet use. Skilled with other programs and able to write long, intricate programs. Able to direct others in drawing preparation and checking. Skilled at modeling and related analysis. Has a broad understanding of manufacturing methods. Able to manage others in a group that can design parts easily manufactured using an appropriate manufacturing method.</td>
<td>Able to use word processors and spreadsheets to produce well formatted reports. Able to use other programs and write computer programs. Able to use engineering tools relevant to their specialty with minimal supervision. Able to develop computer models and use for analysis. Understands basic manufacturing methods and can, design parts that are easily manufacturable.</td>
<td>Marginal ability with word processor and spreadsheet use. Struggles with other programs and programming. Able to use engineering tools relevant to their specialty with close supervision. Marginal understanding of technical communication methods such as drawings, dimensioning and tolerancing as related to their specialty. Has little or no understanding of manufacturing processes and their strengths/weaknesses.</td>
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OFFICE OF THE PROVOST

November 18, 2019

TO: External Program Reviewers and Program Accreditors

FROM: Michael T. Stephenson
Vice Provost for Academic Affairs & Strategic Initiatives

RE: Information required for USDOE Accrediting Bodies

Texas A&M University is accredited by the Southern Association of Colleges and Schools Commission on Colleges to award baccalaureate, master's, and doctoral degrees. Consistent with standard 14.4, the following provides the institution’s official position on its purpose, governance, programs, degrees, diplomas, certificates, personnel, finances, and constituencies and is published in official university documents as noted.

Purpose

Classified by the Carnegie Foundation as a Research Doctoral University (Highest Research Activity), Texas A&M embraces its mission of the advancement of knowledge and human achievement in all its dimensions. The research mission is a key to advancing economic development in both public and private sectors. Integration of research with teaching prepares students to compete in a knowledge-based society and to continue developing their own creativity, learning, and skills beyond graduation.

The institution’s official mission statement, published both on the institution’s web page as well as in its annual university catalog, is:

Texas A&M University (Texas A&M) is dedicated to the discovery, development, communication and application of knowledge in a wide range of academic and professional fields. Its mission of providing the highest quality undergraduate and graduate programs is inseparable from its mission of developing new understandings through research and creativity. It prepares students to assume roles in leadership, responsibility and service to society. Texas A&M assumes as its historic trust the maintenance of freedom of inquiry and an intellectual environment nurturing the human mind and spirit. It welcomes and seeks to serve persons of all racial, ethnic and geographic groups, women and men alike, as it addresses the needs of an increasingly diverse population and a global economy. In the twenty-first century, Texas A&M University seeks to assume a place of preeminence among public universities while respecting its history and traditions.

Governance

The governance of the institution was described in the 2012 certification of compliance submitted to SACSCOC.
Texas A&M University at College Station, the flagship institution of the Texas A&M University System, has branch campuses located in Galveston, Texas and Doha, Qatar. A ten-member Board of Regents, appointed by the Governor, directs the Texas A&M University System. The appointment of each Regent follows Texas Education Code (TEC, Chapter 85, Section 21).

TEC outlines the duties and responsibilities of the Board of Regents. These responsibilities are also defined in System Policy 02.01 Board of Regents and TEC 51.352. The Board elects two officers: Chair and Vice Chair. There are four standing committees: Audit, Academic & Student Affairs, Finance, and Buildings & Physical Plant. Special committees may be appointed by the Chair with Board approval.

At Texas A&M University the President is the chief executive officer; the President is not the presiding officer of the Board of Regents. The President reports to the state-appointed Board of Regents through the Chancellor of the Texas A&M University System. System Policy 2.05 Presidents of System Member Universities defines the duties of the President. The appointment of the President follows conditions set forth in System Policy 01.03 Appointing Power and Terms and Conditions of Employment, section 2.2.

**Personnel**

The institution is led by the President and members of his cabinet:

- Michael K. Young, President
- Carol A. Fierke, Provost and Executive Vice President, Chief Academic Officer
- Jerry R. Strawser, Executive Vice President and Chief Financial Officer
- Michael Benedikt, Vice Provost and Chief International Officer
- Michael T. Stephenson, Vice Provost for Academic Affairs & Strategic Initiatives
- M. Dee Childs, Vice President for Information Technology and CIO
- Michael G. O’Quinn, Vice President for Government Relations & Strategic Initiatives
- Col. Michael E. Fossum, Chief Operating Officer, TAMU-Galveston
- Jeff Risberger, Vice President for HR & Organizational Effectiveness
- Robyn Means Coleman, Vice President and Associate Provost for Diversity
- Mark Barteau, Vice President for Research
- Greg Hartman, Vice Chancellor for Strategic Initiatives, TAMU & Interim Senior Vice President, TAMU-HSC
- Daniel J. Pugh, Sr., Vice President for Student Affairs
- Joseph P. Pettibon, II, Vice President for Enrollment and Academic Services
- Gen Joe E. Ramirez, Jr. Commandant, Corps of Cadets
- Amy B. Smith, Senior Vice President and Chief Marketing and Communications Officer
- Ross Bjork, Athletics Director
- Jonathan Bowling, Sr. Associate Athletics Director, Athletics Compliance
- Shane Hinkley, Vice President for Brand Development
- Andrew P. Morris, VP of Entrepreneurship & Economic Development, Dean of the I-School
- C.J. Woods, Associate Vice President and Chief of Staff
- Kevin McGinnis, Chief Compliance Officer

**Programs, Degrees, Diplomas, and Certificates**

See the appended Degrees and Programs Offered tables.

**Finances**

See the 2019 SACSCOC Financial Profile and Indicators
INSTITUTIONAL SUMMARY FORM
PREPARED FOR COMMISSION REVIEWS

GENERAL INFORMATION

Name of Institution  Texas A&M University

Name, Title, Phone number, and email address of Accreditation Liaison
Michael T. Stephenson
Vice Provost for Academic Affairs and Strategic Initiatives, and SACSCOC Accreditation Liaison
979.845.4016
mstephenson@tamu.edu

Name, Title, Phone number, and email address of Technical Support person for the Compliance Certification
Alicia M. Dorsey
Assistant Provost for Institutional Effectiveness
979.862.2918
amdorsey@tamu.edu

IMPORTANT:

Accreditation Activity (check one):

☐ Submitted at the time of Reaffirmation Orientation
☐ Submitted with Compliance Certification for Reaffirmation
☐ Submitted with Materials for an On-Site Reaffirmation Review
☐ Submitted with Compliance Certification for Fifth-Year Interim Report
☐ Submitted with Compliance Certification for Initial Candidacy/Accreditation Review
☐ Submitted with Merger/Consolidations/Acquisitions
☐ Submitted with Application for Level Change

Submission date of this completed document:  November 13, 2019
EDUCATIONAL PROGRAMS

1. Level of offerings (Check all that apply)
   □ Diploma or certificate program(s) requiring less than one year beyond Grade 12
   □ Diploma or certificate program(s) of at least two but fewer than four years of work beyond Grade 12
   □ Associate degree program(s) requiring a minimum of 60 semester hours or the equivalent designed for transfer to a baccalaureate institution
   □ Associate degree program(s) requiring a minimum of 60 semester hours or the equivalent not designed for transfer
   □ Four or five-year baccalaureate degree program(s) requiring a minimum of 120 semester hours or the equivalent
   □ Professional degree program(s)
   □ Master's degree program(s)
   □ Work beyond the master's level but not at the doctoral level (such as Specialist in Education)
   □ Doctoral degree program(s)
   □ Other (Specify)

2. Types of Undergraduate Programs (Check all that apply)
   □ Occupational certificate or diploma program(s)
   □ Occupational degree program(s)
   □ Two-year programs designed for transfer to a baccalaureate institution
   □ Liberal Arts and General
   □ Teacher Preparatory
   □ Professional
   □ Other (Specify)

GOVERNANCE CONTROL

Check the appropriate governance control for the institution:
□ Private (check one)
   □ Independent, not-for-profit
   Name of corporation
   Name of religious affiliation and control:
   □ Independent, for-profit *
   If publicly traded, name of parent company:
   X Public state *(check one)
   □ Not part of a state system, institution has own independent board
   □ Part of a state system, system board serves as governing board
   X Part of a state system, system board is super governing board, local governing board has delegated authority
   □ Part of a state system, institution has own independent board

* If an institution is part of a state system or a corporate structure, a description of the system operation must be submitted as part of the Compliance Certification for the decennial review. See Commission policy “Reaffirmation of Accreditation and Subsequent Reports” for additional direction.
INSTITUTIONAL INFORMATION FOR REVIEWERS

Directions:
Please address the following and attach the information to this form.

1. History and Characteristics
Provide a brief history of the institution, a description of its current mission, an indication of its geographic service area, and a description of the composition of the student population. Include a description of any unusual or distinctive features of the institution and a description of the admissions policies (open, selective, etc.). If appropriate, indicate those institutions that are considered peers. Please limit this section to one-half page.

History. Texas A&M University (TAMU) opened in 1876 as the state's first public institution of higher education. TAMU is one of a select few institutions in the nation to hold land grant, sea grant (1971) and space grant (1989) designations. A mandatory military component was a part of the land grant designation until 1965; currently, it is one of only three institutions with a full-time Corps of Cadets, leading to commissions in all branches of service. TAMU has two branch campuses, one in Galveston, Texas, (established in 1962, officially merged with TAMU in 1991) and one in Doha, Qatar (established in 2003) and 16 approved off-campus instructional locations. In 2013, the Texas A&M University System Health Science Center merged with TAMU. This same year, TAMU acquired the School of Law from Texas Wesleyan University. Finally, TAMU is classified by the Carnegie Foundation as a Research University (very high research activity).

Mission. Texas A&M University is dedicated to the discovery, development, communication, and application of knowledge in a wide range of academic and professional fields. Its mission of providing the highest quality undergraduate and graduate programs is inseparable from its mission of developing new understandings through research and creativity. It prepares students to assume roles in leadership, responsibility, and service to society. Texas A&M assumes as its historic trust the maintenance of freedom of inquiry and an intellectual environment nurturing the human mind and spirit. It welcomes and seeks to serve persons of all racial, ethnic, and geographic groups as it addresses the needs of an increasingly diverse population and a global economy. In the 21st century, Texas A&M University seeks to assume a place of preeminence among public universities while respecting its history and traditions.

Enrollment Profile. Fall 2018 total enrollment was 69,367 students (across all campuses and locations), with 64,126 (92.4%) located on the main campus in College Station. Undergraduate enrollment made up 78.3% of the total student body, with Hispanic, Black, and American Indian students making up 24.9% of the total student body. TAMU Galveston enrolled 1,815 students as of Fall, 2018, with TAMU Qatar enrolling 549 students.

Admissions Process. Automatic admission is available in two ways: (1) for Texas resident applicants in the top 10% of their high school graduating class; and, (2) for applicants who rank in the top 25% of their high school graduating class and achieve a combined SAT math and SAT critical reading score of at least 1300, with a test score of at least 600 in each component or 30 composite on the ACT with a 27 in the math and English components. The review of all other applicants is based on academic potential, distinguishing characteristics, exceptional circumstances, and personal achievements.

Peer Institutions. Georgia Institute of Technology; The Ohio State University; Pennsylvania State University; Purdue University; University of California at Berkeley, Davis, Los Angeles, and San Diego; University of Florida; University of Illinois at Urbana-Champaign; University of Michigan; University of Minnesota; University of North Carolina at Chapel Hill; University of Texas at Austin; and University of Wisconsin–Madison.

2. List of Degrees
List all degrees currently offered (A. S., B.A., B.S., M.A., Ph.D., for example) and the majors or concentrations within those degrees, as well as all certificates and diplomas. For each credential offered, indicate the number of graduates in the academic year previous to submitting this report. Indicate term dates.

Does the institution offer any credit, non-credit, or pathways English as a Second Language (ESL) programs? If yes, list the programs.
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*Major dependent certificates
3. Off-Campus Instructional Locations and Branch Campuses

List all approved off-campus instructional locations where 25% or more credit hours toward a degree, diploma, or certificate can be obtained primarily through traditional classroom instruction. Report those locations in accord with the Commission’s definitions and the directions as specified below.

Table 1: Off-campus instructional sites—a site located geographically apart from the main campus at which the institution offers 25% or more of its credit hours for a diploma, certificate, or degree. This includes high schools where courses are offered as part of dual enrollment. For each site, provide the information below. The list should include only those sites reported to and approved by SACSCOC. Listing unapproved sites below does not constitute reporting them to SACSCOC. In such cases when an institution has initiated an off-campus instructional site as described above without prior approval by SACSCOC, a prospectus for approval should be submitted immediately to SACSCOC.

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<th>Date implemented by the institution</th>
<th>Educational programs offered (specific degrees, certificates, diplomas) with 50% or more credit hours offered at each site</th>
<th>Is the site currently active? (At any time during the past 5 years, have students been enrolled and courses offered? If not, indicate the date of most recent activity.)</th>
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<td>Houston Methodist Hospital</td>
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<tr>
<td>Institute of Biosciences and Technology</td>
<td>2121 W. Holcombe Blvd. Houston, TX 77030</td>
<td>2000</td>
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<td>Rangel College of Pharmacy</td>
<td>1010 W. Avenue B. Kingsville, TX 78363</td>
<td>2011</td>
<td>2006</td>
<td>PHARMACY</td>
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<tr>
<td>Lawrence Livermore National Laboratory</td>
<td>7000 East Avenue Livermore, CA 94550</td>
<td>2018</td>
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<td>Sandia National Laboratories, California</td>
<td>7011 East Avenue Livermore, CA 94550</td>
<td>2018</td>
<td>2008</td>
<td>NATIONAL SECURITY AFFAIRS</td>
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<td>Sandia National Laboratories, New Mexico</td>
<td>1515 Eubank S.E. Albuquerque, NM 87123</td>
<td>2018</td>
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<td>NATIONAL SECURITY AFFAIRS</td>
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<tr>
<td>School of Public Health - McAllen Teaching Site</td>
<td>2101 South McColl Road McAllen, TX 78503</td>
<td>2011</td>
<td>2010</td>
<td>HEALTH PROMOTION AND COMMUNITY HEALTH SCIENCES</td>
<td>MPH</td>
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<tr>
<td>Texas A&amp;M Higher Education Center at McAllen</td>
<td>6200 Tres Lagos Blvd McAllen, TX 78504</td>
<td>2017</td>
<td>2018</td>
<td>BIOMEDICAL SCIENCES</td>
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<td>FOOD SYSTEMS INDUSTRY MANGEMENT</td>
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<td>MULTIDISCIPLINARY ENGINEERING TECHNOLOGY</td>
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<tr>
<td>Clinical Learning Resource Center</td>
<td>Health Professions Building 3950 North A. W. Grimes Blvd. Round Rock, TX 78665</td>
<td>2011</td>
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<td>MEDICINE</td>
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<tr>
<td>College of Medicine - Temple</td>
<td>2401 S. 31st Street Temple, TX 75508</td>
<td>2000</td>
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<tr>
<td>Travis Park Plaza</td>
<td>711 Navarro Street, Suite 250 San Antonio, TX 78205</td>
<td>2017</td>
<td>2017</td>
<td>JURISPRUDENCE</td>
<td>MJ</td>
</tr>
</tbody>
</table>

**Table 2: Off-campus instructional sites** at which the institution offers 25-49% of its credit hours for a diploma, certificate, or degree—including high schools where courses are offered as dual enrollment. *Note: institutions are required to notify SACSCOC in advance of initiating coursework at the site.* For each site, provide the information below.

<table>
<thead>
<tr>
<th>Name of Site (Indicate if site is currently active or inactive. If inactive, date of last course offerings and date of projected reopening)</th>
<th>Physical Address (street, city, state, country) Do not include PO Boxes.</th>
<th>Date of SACSCOC letter accepting notification</th>
<th>Date Implemented by the institution</th>
<th>Educational programs offered (specific degrees, certificates, diplomas) with 25-49% credit hours offered at each site</th>
<th>Is the site currently active? (At any time during the past 5 years, have students been enrolled and courses offered? If not, indicate the date of most recent activity.)</th>
</tr>
</thead>
</table>

**Table 3: Branch campus**—an instructional site located geographically apart and independent of the main campus of the institution. A location is independent of the main campus if the location is (1) permanent in nature, (2) offers courses in educational programs leading to a degree, certificate, or other recognized educational credential, (3) has its own faculty and administrative or supervisory organization, and (4) has its own budgetary and hiring authority. *The list should include only those branch campuses reported to and approved by SACSCOC.* Listing unapproved branch campuses below does not constitute reporting them to SACSCOC. A prospectus for an unapproved branch campuses should be submitted immediately to SACSCOC.

<table>
<thead>
<tr>
<th>Name of Branch Campus</th>
<th>Physical Address (street, city, state, country) Do not include PO Boxes.</th>
<th>Date Approved by SACSCOC</th>
<th>Date Implemented by the institution</th>
<th>Educational programs (specific degrees, certificates, diplomas) with 50% or more credit hours offered at the branch campus</th>
<th>Is the campus currently active? (At any time during the past 5 years, have students been enrolled and courses offered? If not, indicate the date of most recent activity.)</th>
</tr>
</thead>
</table>

| Texas A&M University at Galveston | 200 Seawolf Parkway Galveston, TX 77553 | 1992 | 1991 | INTERDISCIPLINARY ENGINEERING | BS | Yes |
| | | | | MARINE BIOLOGY | BS | |
| | | | | MARINE BIOLOGY | MS | |
| | | | | MARINE BIOLOGY | PHD | |
| | | | | MARINE ENGINEERING TECHNOLOGY | BS | |
| | | | | MARINE FISHERIES | BS | |
| | | | | MARINE RESOURCES MANAGEMENT | MMR | |
| | | | | MARINE SCIENCES | BS | |
| | | | | MARINE TRANSPORTATION | BS | |
| | | | | MARITIME ADMINISTRATION | BS | |
| | | | | MARITIME ADMINISTRATION & LOGISTICS | MML | |
4. Distance and Correspondence Education

Provide an initial date of approval for your institution to offer distance education. Provide a list of credit-bearing educational programs (degrees, certificates, and diplomas) where 50% or more of the credit hours are delivered through distance education modes. For each educational program, indicate whether the program is delivered using synchronous or asynchronous technology, or both. For each educational program that uses distance education technology to deliver the program at a specific site (e.g., a synchronous program using interactive videoconferencing), indicate the program offered at each location where students receive the transmitted program. Please limit this description to one page, if possible.

<table>
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<th>Credit Bearing Degree Programs</th>
<th>Synchronous, Asynchronous, or Both</th>
<th>Site</th>
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<tr>
<td>Advance International Affairs</td>
<td>CERT-G</td>
<td>Asynchronous</td>
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<tr>
<td>Aerospace Engineering</td>
<td>MENG</td>
<td>Asynchronous</td>
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<tr>
<td>Agricultural Development</td>
<td>MAGR</td>
<td>Asynchronous</td>
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<tr>
<td>Agricultural Education</td>
<td>EDD</td>
<td>Asynchronous</td>
</tr>
<tr>
<td>Agricultural Systems Management</td>
<td>MS</td>
<td>Asynchronous</td>
</tr>
<tr>
<td>Agriculture eLearning Development</td>
<td>CERT-G</td>
<td>Asynchronous</td>
</tr>
<tr>
<td>Analytics</td>
<td>MS</td>
<td>Synchronous, North America</td>
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<tr>
<td>Applied Behavior Analysis</td>
<td>CERT-G</td>
<td>Both, World-wide</td>
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<td>Applied Statistics</td>
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<tr>
<td>Bilingual Education</td>
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<tr>
<td>Bilingual Education</td>
<td>MS</td>
<td>Asynchronous</td>
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<tr>
<td>Biological &amp; Agricultural Engineering</td>
<td>MENG</td>
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<tr>
<td>Computer Engineering</td>
<td>MENG</td>
<td>Asynchronous</td>
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<tr>
<td>Curriculum &amp; Instruction</td>
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<tr>
<td>Curriculum &amp; Instruction</td>
<td>MED</td>
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<tr>
<td>Education for Health Care Professionals</td>
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<td>Education for Health Care Professionals</td>
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<tr>
<td>Educational Administration</td>
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<tr>
<td>Educational Human Resource Development</td>
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<tr>
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<td>Laws</td>
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<td>MRRD</td>
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<td>Statistics</td>
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<tr>
<td>Tourism Management*</td>
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<tr>
<td>Wildlife Science</td>
<td>MWSC</td>
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*Major dependent certificates

5. Accreditation

   (1) List all agencies that currently accredit the institution and any of its programs and indicate the date of the last review by each.

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<th>Accrediting Agency</th>
<th>Program</th>
<th>Last Reviewed</th>
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<td>Accreditation Council for Pharmacy Education</td>
<td>Irma Lerma Rangel College of Pharmacy</td>
<td>April 2014</td>
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<tr>
<td>American Bar Association</td>
<td>Texas A&amp;M University School of Law</td>
<td>October 2016</td>
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<tr>
<td>American Chemical Society</td>
<td>Chemistry</td>
<td>May 2013</td>
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<tr>
<td>American Council for Construction Education</td>
<td>Construction Management</td>
<td>October 2017</td>
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<tr>
<td>American Psychological Association</td>
<td>Clinical Psychology</td>
<td>October 2017</td>
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<td>American Psychological Association</td>
<td>Counseling Psychology</td>
<td>May 2015</td>
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<td>American Psychological Association</td>
<td>School Psychology</td>
<td>May 2015</td>
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<tr>
<td>American Society of Agricultural and Biological Engineers</td>
<td>Agricultural Systems Management</td>
<td>September 2015</td>
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<tr>
<td>American Veterinary Medical Association Council on</td>
<td>Veterinary Medicine</td>
<td>December 2015</td>
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<td>Education</td>
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<tr>
<td>Association to Advance Collegiate Schools of Business</td>
<td>The business baccalaureate, master’s, and doctoral</td>
<td>January 2017</td>
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<tr>
<td>Commission on Accreditation for Dietetics Education</td>
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(2) If SACS Commission on Colleges is not your primary accreditor for access to USDDE Title IV funding, identify which accrediting agency serves that purpose.

     Not applicable.

(3) List any USDDE-recognized agency (national and programmatic) that has terminated the institution’s accreditation (include the date, reason, and copy of the letter of termination) or list any agency from which the institution has voluntarily withdrawn (include copy of letter to agency from institution).

1. COMMISSION ON ENGLISH LANGUAGE PROGRAM ACCREDITATION (CEA) – The English Language Institute at Texas A&M University voluntarily withdrew from CEA. The English Language Institute was accredited in good standing through August, 2018, at the time of the voluntary withdrawal (with no history of adverse action). The university made the decision to close the English Language Institute as an administrative unit on May 31, 2017. Please see attached correspondence.
(4) Describe any sanctions applied or negative actions taken by any USDOE-recognized accrediting agency (national, programmatic, SACSCOC) during the two years previous to the submission of this report. Include a copy of the letter from the USDOE-recognized agency to the institution.

None.

6. **Relationship to the U.S. Department of Education**

   Indicate any limitations, suspensions, or termination by the U.S. Department of Education in regard to student financial aid or other financial aid programs during the previous three years. Report if on reimbursement or any other exceptional status in regard to federal or state financial aid.

None.
2019 SACSCOC Financial Profile and Indicators

Institution Name Address: Texas A&M University, College Station, TX

Thank you for completing the 2019 Financial Profile and Indicators:

The Profile was submitted by Michael T. Stephenson on 7/8/2019 and approved by Michael K. Young on 7/12/2019.

FINAL SUBMISSION

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<td>Total Liabilities (add Deferred Inflows):</td>
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FROM AUDITED FY 2018 Financial Statements
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