

## Technical Electives

Catalog #141: 2018-2019

(Revised June 2018)

### Technical Electives (15 hours)

- 3 hours must be from the Mechanical and Manufacturing Systems Electives
- 3 hours must be from the Thermo-fluid System Electives
- At least 3 hours must be from the MEEN Technical Electives (can be from either area below)
- 3 hours can be from either MEEN or Non-MEEN Technical Electives
- 3 hours of General Elective

### MEEN Technical Electives

#### **Mechanical and Manufacturing Systems Electives**

Course	Name	Prerequisites
MEEN 408*	Introduction to Robotics	MEEN 364 or equivalent; junior or senior classification
MEEN 411	Mechanical Controls	MEEN 364
MEEN 430	Nanomaterials	Junior or senior classification or approval of instructor
MEEN 431	Advanced System Dynamics and Controls	MEEN 364; junior or senior classification
MEEN 432	Automotive Engineering	MEEN 363
MEEN 433*	Mechatronics	MEEN 364 or equivalent
MEEN 434*	Dynamics and Modeling of Mechatronics Systems	MEEN 364
MEEN 440*	Bio-Inspired Design	MEEN 368 or BMEN 361 or BAEN 375
MEEN 442*	Computer Aided Engineering	MEEN 363 and MEEN 368
MEEN 444*	Finite Element Analysis in Mechanical Engineering	MEEN 357 and MEEN 368 or equivalents
MEEN 445*	Mechanics of Compliant Materials	Grade of C or better in MEEN 344
MEEN 451*	Viscoelastic Materials	Grade of C or better in MEEN 368
MEEN 453	Additive & Subtractive Processes in Custom Man.	Grade of C or better in MEEN 360 or MEEN 361, or equivalent
MEEN 455	Engineering with Plastics	MEEN 222/MSEN 222; junior or senior classification
MEEN 458	Processing and Characterization of Polymers	MEEN 222/MSEN 222
MEEN 459*	Sound and Vibration Measurements	MEEN 363; MATH 308
MEEN 460*	Corrosion Engineering	MEEN 360 and MEEN 361, or equivalent
MEEN 467*	Mechanical Behavior of Materials	MEEN 360 and MEEN 361
MEEN 471*	Elements of Composite Materials	MEEN 360, MEEN 361, and MEEN 368
MEEN 475	Materials in Design	Grade of C or better in MEEN 360 and MEEN 361
MEEN 476	Nanoscale Issues in Manufacturing	MEEN 222 /MSEN 222; junior or senior classification
MEEN 477	Air Pollution Engineering	Grade of C or better in BAEN 340, CVEN311/EVEN 311, or MEEN 344

#### **Thermo-fluid and Energy Systems Elective**

Course	Name	Prerequisites
MEEN 406*	Energy Management in Industry	Grade of C or better in MEEN 260 and MEEN 315
MEEN 410*	Internal Combustion Engines	MEEN 344 or equivalent
MEEN 414*	Principles of Turbomachinery	MEEN 421; junior or senior classification
MEEN 417	Basics of Plasma Engineering and Applications	Grade of C or better in PHYS 208 or equivalent; senior classification in NUEN, MEEN, AERO, or PHYS
MEEN 421	Thermal-Fluids Analysis and Design	Grade of C or better in MEEN 461
MEEN 436	Principles of Heating, Ventilation and Air Conditioning	Grade of C or better in MEEN 344 or equivalent
MEEN 437	Principles of Building Energy Analysis	MEEN 315 or equivalent; junior or senior classification
MEEN 439*	Solar Energy Engineering	MEEN 315
MEEN 454*	Tribology - Mechanical Interface Design	Grade of C or better in MEEN 344 and MEEN 368
MEEN 463*	Cogeneration Systems	MEEN 421 or equivalent
MEEN 469*	Alternative Energy Conservation	MEEN 315
MEEN 472*	Gas Dynamics	MEEN 344

#### **Special Topics - One time course offerings in a new interest area**

MEEN 489	Special Topics Course in Mechanical Engineering	Check Howdy for current offerings and prerequisites
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\* May be offered stacked with a graduate course and taken as part of the Fast Track Program. See advisor for more details.

**Non-MEEN Technical Electives described on next page (backside)**

**NON-MEEN Technical Electives (no more than 3 hours)**

Students may take non-MEEN courses, either within or outside the College of Engineering, to satisfy technical elective requirements. All non-MEEN technical electives must be approved by the Undergraduate Advising Office, using the following set of criteria: 1. Course has a discipline-specific prerequisite, 2. Course content requires advanced math skills (i.e., Math 251), 3. Course uses formal analytical methods and requires quantitative coursework, and 4. Course material provides a deep understanding in a specific technical discipline.

Based on previous practice, the following courses are pre-approved as non-MEEN technical electives:

**Non-MEEN Technical Electives**

<b>ENGR Project Management Minor</b>	300 or 400 level engineering courses	<a href="http://catalog.tamu.edu/undergraduate/engineering/engineering-project-management-minor/">http://catalog.tamu.edu/undergraduate/engineering/engineering-project-management-minor/</a>
<b>Energy Engineering Certificate</b>	300 or 400 level engineering courses	<a href="http://engineering.tamu.edu/academics/certificates/energy">http://engineering.tamu.edu/academics/certificates/energy</a>
<b>Polymer Specialty Cert</b>	300 or 400 level engineering or science courses	<a href="http://engineering.tamu.edu/academics/certificates/polymer">http://engineering.tamu.edu/academics/certificates/polymer</a>
<b>Safety Engineering Specialty Cert</b>	300 or 400 level engineering courses	<a href="http://engineering.tamu.edu/academics/certificates/safety">http://engineering.tamu.edu/academics/certificates/safety</a>
<b>Aerospace Engineering</b>	AERO 303, 321	
<b>Architecture</b>	ARCH 619	(requires graduate credit approval form; see advisor for details)
<b>Astronomy</b>	ASTR 314	
<b>Biological &amp; Agricultural Engineering</b>	BAEN 412, 422 (cross-listed with CHEN 422)	
<b>Biochemistry</b>	BICH 410	
<b>Biomedical Engineering</b>	BMEN 448, 458	
<b>Chemistry</b>	CHEM 227, 228, 315, 322	
<b>Chemical Engineering</b>	CHEN 422 (cross-listed with BAEN 422)	
<b>Civil Engineering</b>	CVEN 322	
<b>Computer Science</b>	CSCE 312, 313, 314	
<b>Electrical Engineering</b>	ECEN 314, 325, and 441	
<b>Electronic Systems Engineering Technology</b>	ESET 369	
<b>Geology</b>	GEOL 404	
<b>Industrial &amp; Systems Engineering</b>	ISEN 430, 440 (prerequisite MATH 304)	
<b>Materials Science</b>	MSEN 310, 320, 420	
<b>Mathematics</b>	MATH 304, 311, 323, 401, 407, 409, 411, 412, 414, 425, 433	
<b>Nuclear Engineering</b>	NUEN 301	
<b>Physics</b>	PHYS 222 (only if NOT taken as part of a Physics Minor)	
<b>Petroleum Engineering</b>	PETE 310, 311, 325, 353	
<b>Safety Engineering</b>	SENG 455	
<b>Statistics</b>	STAT 211, 414	
<b>CO-OP</b>	ENGR 385 (3 hours may be used)	
<b>MEEN or Non-MEEN</b>	MEEN 485/491 (possibly up to 3 hours each) upon approval by Advising Office.	Proposal required for review and approval by Advising Office before the first week of class; see an advisor for details. Both 485 and 491 can be reviewed and approved as 485H and 491H.

**General Elective (no more than 3 hours)**

Students are also required to take 3 hours of a general elective. This can be satisfied by any 300 or 400 level course in any department.