Technical Electives

Catalog #142: 2019-2020

(Revised July 2019)

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

** 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

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