Mechanical Engineering Stem & Technical Electives
Catalog #138: 2015-2016
(rev. March 2016)

Stem Courses (6 hours)
Select two (2) of the following 3 courses
- MEEN 421 - Thermo-Fluids Analysis and Design. Prerequisites: MEEN 461; MEEN 315; junior or senior classification.
- MEEN 431 - Advanced System Dynamics and Controls. Prerequisites: MEEN 364; junior or senior classification.
- MEEN 475 - Materials in Design. Prerequisites: CVEN 305; MEEN 360.

Technical Electives (9 hours)
At least 3 hours must be from the MEEN Technical Electives below
MEEN Technical Electives

Materials and Manufacturing
- MEEN 430 - Nonmaterials. Prerequisites: Junior or senior classification or approval of instructor.
- MEEN 448 - Fundamentals of Nondestructive Testing. Prerequisite: MEEN 360.
- MEEN 451 - Viscoelastic Materials. Prerequisite: CVEN 305.
- MEEN 455 - Engineering with Plastics. Prerequisite: MEEN 222 or approval of instructor.
- MEEN 458 - Processing and Characterization of Polymers. Prerequisite: MEEN 222.
- MEEN 460 - Corrosion Engineering. Prerequisite: MEEN 360 or equivalent.
- MEEN 467 - Mechanical Behavior of Materials. Prerequisite: MEEN360.
- MEEN 471 - Elements of Composite Materials. Prerequisites: MEEN 368 and 360 or approval of instructor.
- MEEN 475* - Materials in Design. Prerequisite: MEEN 360; CVEN 305
- MEEN 476 - Nanoscale Issues in Manufacturing. Prerequisites: MEEN 222 or approval of instructor; junior or senior classification.
- MEEN 477 - Air Pollution Engineering. Prerequisite: CVEN 305.

Dynamics and Controls
- MEEN 408 - Introduction to Robotics. Prerequisite: MEEN 364 or equivalent; junior or senior classification.
- MEEN 411 - Mechanical Controls. Prerequisite: MEEN 364.
- MEEN 431* - Advanced System Dynamics and Controls. Prerequisite: MEEN 364; junior or senior classification.
- MEEN 433 - Mechatronics. Prerequisite: MEEN 364 or equivalent.
- MEEN 432 - Automotive Engineering. Prerequisite: MEEN 363.
- MEEN 434 - Dynamics and Modeling of Mechatronic Systems. Prerequisite: MEEN 364.

Thermo-fluid and Energy Systems
- MEEN 410 - Internal Combustion Engines. Prerequisites: MEEN 344 or equivalent or approval of instructor.
- MEEN 414 - Principles of Turbomachinery. Prerequisite: MEEN 421 or approval of instructor; junior or senior classification.
- MEEN 421* - Thermal-Fluids Analysis and Design. Prerequisites: MEEN461; MEEN 315; junior or senior classification.
- MEEN 436 - Principles of Heating, Ventilation and Air Conditioning. Prerequisite: MEEN 461 or equivalent.
- MEEN 437 - Principles of Building Energy Analysis. Prerequisite: MEEN 315 or equivalent; junior or senior classification.
- MEEN 439 - Solar Energy Engineering. Prerequisite: MEEN 315.
- MEEN 463 - Cogeneration Systems. Prerequisite: MEEN 421.
- MEEN 469 - Alternative Energy Conversion. Prerequisite: MEEN 315.
- MEEN 472 - Gas Dynamics. Prerequisite: MEEN 344.

Design
- MEEN 440 - Bio-Inspired Design. Prerequisite: MEEN 386 or BMEN 361 or BAEN 375.
- MEEN 441 - Design of Mechanical Components and Systems. Prerequisite: MEEN 368 or approval of instructor.
- MEEN 442 - Computer Aided Engineering. Prerequisite: MEEN 363 and MEEN 368.
- MEEN 444 - Finite Element Analysis in Mechanical Engineering. Prerequisite: MEEN 357and MEEN 368 or equivalents.
- MEEN 459 - Mechanical Vibrations. Prerequisites: MEEN 363; MATH 308.
- MEEN 445 - Engineering Applications of Solid Mechanics. Prerequisite: CVEN 305 and MEEN 368.

Special Topics - One time course offerings in a new interest area
- MEEN 489 - Special Topics in Mechanical Engineering
  - Check Howdy for current offerings

* MEEN Stem course will qualify as a MEEN technical elective only after a student has taken at least two MEEN Stem courses prior.

( 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 6 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:

♦ Energy Engineering Certificate: 300 or 400-level engineering courses: http://engineering.tamu.edu/academics/certificates/energy
♦ Eng. Proj. Mgmt Cert.: 300 or 400-level eng. courses: http://engineering.tamu.edu/academics/certificates/engineering-project-management
♦ 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
♦ ENGR 410 only when coupled with International Certificate: http://engineering.tamu.edu/international/certificate
♦ Architecture: ARCH 619 (N.B., requires graduate credit approval form; see advisor for details).
♦ Astronomy: ASTR 314
♦ Biological & Agricultural Engineering: BAEN 412
♦ Biochemistry: BICH 410
♦ Chemistry: CHEM 227, 228, 315, 322.
♦ Civil Engineering: CVEN 322
♦ Computer Science: CSCE 312, 313, 314
♦ Geology: GEOL 404
♦ Electrical Engineering: ECEN 314, 325, and 441.
♦ Engineering Design Graphics: ENDG 407 (cannot be used toward the degree in combination with MEEN 442), ENDG 408 (only if a student had either ENDG 407 or MEEN 442 as pre-requisites)
♦ Mathematics: MATH 304, 311, 323, 401, 407, 409, 411, 412, 433
♦ 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: 3 hours of ENGR 385 may be used.
♦ Any (MEEN or non-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.