Mechanical Engineering (BSME) Requirements and Courses

What are the BSME degree requirements?
The best way for a student to track degree requirements is to look at a degree audit on DARS. This will include new courses that satisfy requirements from a previous catalog date. An advisor or student can request a degree audit at any time online at the link below. Degree requirements follow the catalog date when the student matriculated. http://engineering.wustl.edu/Academics/DARS.asp

Are prerequisites strictly enforced?
Yes. However, requests for waiver of prerequisites or substitution of required courses may be submitted in writing to the Associate Department Chair for Mechanical Engineering and must be approved by the course instructor, the student’s advisor, and the Associate Department Chair.

Are the ME introductory courses required?
Freshmen are encouraged but not required to take one or more of the introduction to mechanical engineering courses.

- E37 MEMS 1001 Machine Shop Practicum
- E37 MEMS 1003 Mechanical Engineering Design and Build
- E37 MEMS 101 Intro to Mechanical Engineering and Mechanical Design

Do I have enough engineering topics courses?
Students who transfer in credit for engineering courses could be short of engineering topics. DARS does check for total topics units. A database of courses from other schools approved for transfer credit is available at the following link. http://registrar.seas.wustl.edu/EVALS/evals.asp

When should I declare a major?
Students who have not declared a major should do so by the third semester.

Which courses are in the mechanics sequence?
MEMS 253 (fall) or BME 240 (spring)
255 (fall and spring)
350 (fall and spring).
Students are encouraged to take E37 350 in the fourth semester.

Which of the required MEMS courses are offered only once a year?
MEMS 301, 311, 3410, 3411, 342, 411, 412, 4301 and 431.

What is the physical or life science elective?
A course from Bio, EPSc, EnSt, Phys, Chem taken for credit and graded: A suitable course is a 3 unit 2xx or greater course from Bio (L41), EPSc (L19), EnSt (L82), Phys (L31) or Chem (L07) with a NS attribute (natural science). Some suggested courses are:
Which courses count as social science or humanities?
Washington University in St. Louis courses labeled with the EN:H or EN:S attribute in the semester course listings will count respectively toward the humanities or social sciences requirement for engineering degrees. In addition, all art courses (coded F10 and F20) will count toward the engineering school's humanities requirement. Other approved H&SS courses can be found at:

How do I find social science and humanities courses in WEBSTAC?
WebSTAC has a search feature that will reveal courses with an H or S attribute. Go to: WebSTAC; Course Listings; by Semester Search; SP2014 Arts and Sciences; choose details (department, level, time, etc) and EN H or EN S.

Do the ethics and professional values courses count as social science or humanities?
Three one-unit courses, E60 4501, 4502 and 4503 are the ethics and professional values courses. Humanity or social science credit for these courses varies depending on the student’s matriculation date.

2009 Freshmen and earlier may use 450X as H or SS credit
2010 Freshmen and later may use 450X only as SS credit

Which courses satisfy the control systems requirement?
ME’s can take either MEMS 4301 Modeling Simulation and Control (spring) or ESE 441 Control Systems (fall and spring) to satisfy the control systems requirement. Note that the ESE 441 prerequisite is ESE 351 or MEMS 431.

I have a conflict with ESE 230 and MEMS 4301.
Take ESE 441 Control Systems (fall and spring). Note that the ESE 441 prerequisite is ESE 351 or MEMS 431.

What is the computing requirement?
CSE 200 is the computing requirement (effective date is FL2009). The only prerequisite for CSE 200 is Math 132. Freshmen should take CSE 200 in the spring semester. Students taking CSE 131 or equivalent should take ESE 101 (a MATLAB review course).
What do I do if I have a conflict with Chem I Lab?
Fall sophomore students with a Chem 151 / ESE 230 conflict can take ESE 326 in the fall and ESE 230 in the spring.

Is Math L24 3200 equivalent to ESE 326?
Math L24 3200 (or L24 320) does NOT satisfy the ESE 326 requirement.

What are the new engineering math courses?
The Math Department has reduced Calculus III and Differential Equations by one unit to 3 units each. For FL2013 SEAS has replaced the 4-unit ESE 317 by two 3-unit courses, ESE 318 and 319. Both are required for the BSME degree.

What is the prerequisite for MEMS E37 411 Mechanical Engineering Design?
E37 311 Machine Elements is a prerequisite for E37 411 Mechanical Engineering Design Project.

In which extracurricular activities do ME’s participate?
The faculty and administration encourage participation in extracurricular activities. Ask your advisor on how to get involved with ASME, EWB, FSAE, or IEEE (the dance floor for Vertigo has been a popular project that involves students from many departments). Take the first step to learn about the profession and apply your studies to “real-world” problems through extra curricular activities.

How do I become a professional engineer?
Professional licensure in engineering is an option for seniors to consider; the initial step in that process is the Fundamentals of Engineering exam. Apply to the Missouri Board of the NCEES to register for the exam. To be eligible one must have earned or expect to earn an ABET-accredited degree in engineering. More information on NCEES, licensure, the exam and registration can be found at
http://www.ncees.org/Exams/States/MO.php
http://www.ncees.org/About_NCEES.php

How many units can I take?
Full undergraduate tuition covers 12-21 units. Undergraduates must maintain full time status by taking a minimum of 12 units each semester.

What are the BSME requirements for my matriculation year?
See the department web site for the curriculum checklist by catalog year.
http://mems.wustl.edu/undergraduateprograms/Pages/bs-in-mechanical-engineering.aspx

When can I use the pass/fail option?
There are restrictions on when a student may use the pass/fail grading option.
- MEMS degree requirements that list specific courses are not satisfied with courses taken pass/fail.
- MEMS elective degree requirements are not satisfied with courses taken pass/fail.
The Physical or Life Science Elective degree requirement is not satisfied with courses taken pass/fail.

The pass/fail grading option may be used with the humanities/social sciences electives course requirement or with free electives.

Engineering students are eligible to register each semester for up to 6 units on the pass/fail option, up to a maximum of 18 units attempted. The pass/fail grading option replaces the letter grades A-F with either P# or F#. Assigning the grade P# to a course means the student passed the course; assigning the grade F# means the student did not pass the course. Neither grade affects the student's grade-point average. The units attached to a course assigned the grade P# may count towards the student's total cumulative units required.

How is a repeat course noted on my transcript?
If a student repeats a course, only the second grade is included in the calculation of the grade point average. Both enrollments and grades are shown on the student’s official transcript. The symbol R next to the first enrollment’s grade indicates that the course was later retaken. Credit toward the degree is allowed for the latest enrollment only.

Where can I find information on popular minors?
Information on popular technical minors may be found at the web sites below:
Aerospace Minor: http://mems.wustl.edu/undergraduateprograms/Pages/MinorinAerospaceEngineering.aspx
Robotics Minor: http://ese.wustl.edu/undergraduateprograms/Pages/MinorinRobotics.aspx
Mechatronics Minor: http://ese.wustl.edu/undergraduateprograms/Pages/MinorInMechatronics.aspx

What are the requirements for the 9 units of senior electives?
Only 3 units of Independent Study (MEMS 400) are allowed as a MEMS 3xx/4xx elective. An independent study proposal must be submitted and approved before the first day of classes of the semester. Each section of the proposal must be filled out in detail including: a clear definition the project, an assessment of the student's background and skills to perform the required procedures and methods, and a firm set of expected deliverables and schedule. At the end of the semester a copy of the deliverables is to be submitted to the department to be filed with the student’s records. For a 3-credit course a student is typically expected to spend 8-10 hours a week, meet weekly with his or her project supervisor, and submit a substantial report at the end of the project.

One of the MEMS (3xx/4xx) electives may be taken from another department with preapproved permission. Please see the list below for preapproved courses or see Prof Jerina for approval of non-MEMS courses.

Graduate courses (5xx) may be taken by undergraduates as electives. Seniors should venture into the graduate courses for their electives. Seniors are well qualified to take graduate classes with what they have learned in their undergraduate curriculum. Taking one or more of these courses will give students an opportunity to see that graduate education is an extension of undergraduate education. With that in mind, here is a list of
possible electives. Other courses that enhance MEMS education can be considered a MEMS elective with prior approval. NOTE: These courses often do not list prerequisites, so the student should check with the instructor to determine the level of material to be covered. Contact Dr. Paris for permission to take his course. WEBSTAC will reveal the 5XXX level courses if the 5XX level box is checked (the default is 100-400).

Approved BSME senior elective courses:

- E37 MEMS 3601 Materials Engineering
- E37 MEMS 4101 Manufacturing Processes
- E37 MEMS 424 Introduction to Finite Element Analysis of Structures
- E37 MEMS 5001 Optimization Methods in Engineering
- E37 MEMS 5101 Analysis and Design of Fluid Power Systems
- E37 MEMS 5102 Materials Selection in Design
- E37 MEMS 5301 Nonlinear Vibrations
- E37 MEMS 5302 Theory of Vibrations
- E37 MEMS 5401 General Thermodynamics
- E37 MEMS 5402 Radiation Heat Transfer
- E37 MEMS 5403 Conduction and Convection Heat Transfer
- E37 MEMS 5410 Fluid Dynamics I
- E37 MEMS 5411 Fluid Dynamics II
- E37 MEMS 5412 Computational Fluid Dynamics
- E37 MEMS 5413 Advanced Computational Fluid Dynamics
- E37 MEMS 5414 Aeroelasticity
- E37 MEMS 5420 HVAC I Analysis and Design
- E37 MEMS 5421 HVAC II Analysis and Design
- E37 MEMS 5422 Solar Energy Thermal Processes
- E37 MEMS 5423 Sustainable Environmental Building Systems
- E37 MEMS 5424 Thermo-Fluid Modeling of Renewable Energy Systems
- E37 MEMS 5500 Elasticity
- E37 MEMS 5501 Mechanics of Continua
- E37 MEMS 5504 Fracture Mechanics
- E37 MEMS 5506 Experimental Methods in Solid Mechanics
- E37 MEMS 5510 Finite Element Analysis
- E37 MEMS 5520 Advanced Analytical Mechanics
- E37 MEMS 5560 Interfaces and Attachments in Natural and Engineered Structures
- E37 MEMS 5563 Orthopaedic Biomechanics-Bones and Joints
- E37 MEMS 5564 Orthopaedic Biomechanics-Cartilage/Tendon
- E37 MEMS 5601 Mechanical Behavior of Materials
- E37 MEMS 5602 Non-metallics
- E37 MEMS 5603 Materials Characterization I
- E37 MEMS 5604 Materials Characterization II
- E37 MEMS 5605 Mechanical Behavior of Composites
- E37 MEMS 5606 Soft Nanomaterials
- E37 MEMS 5607 Introduction to Polymer Blends and Composites
- E37 MEMS 5608 Introduction to Polymer Science and Engineering
- E37 MEMS 5609 Electronic Materials Processing
- E37 MEMS 5610 Quantitative Materials Science and Engineering
- E37 MEMS 5611 Principles and Methods of Micro- and Nanofabrication
- E37 MEMS 5700 Aerodynamics
- E37 MEMS 5701 Aerospace Propulsion
- E37 MEMS 5703 Analysis of Rotary Wing Systems
- E37 MEMS 5704 Aircraft Structures
- E37 MEMS 5705 Wind Energy Systems
- E37 MEMS 5801 Micro-Electro-Mechanical Systems I
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