

EME Graduate Course Petition and Substitution Policy

Purpose

To establish the guidelines, forms, and procedures for requesting and approving substitutions to and petitions for the graduate program course requirements in the EME department.

Academic Goal

To support the appropriate training by graduate students in Energy and Mineral Engineering and allow necessary flexibility in their instruction based on individual backgrounds and unique instructional opportunities offered at the university.

Scope

All graduate students in the MS or PhD programs in Energy and Mineral Engineering.

Background

To the present, the EME department has maintained a requirement review and course substitution policy managed through email and other non-standardized written documents. This policy aims to formalize this process and improve the documentation retained to ensure consistency and reduce the uncertainty for graduate students and advisers in EME.

Related University and Graduate School Policies

GCAC-203 Graduate Course Designations
GCAC-631 Degree Requirements – Research Master's

Policy Statement

1. EME graduate students may request substitutions to course requirements for their degree program or degree option consistent with university and graduate school policy and may petition for courses outside of EME to be counted towards their degree requirements.

EME Core Courses

2. EME graduate students will generally not be granted substitutions to required EME core courses, except as noted below:

- a. Course substitutions are allowed if fewer than 2 EME core courses are offered during an academic year. In such cases, the request to substitute a course for an EME core course must be approved by the student's advisor and the Associate Department Head for Graduate Education.

Option Courses

3. EME graduate students will generally not be granted substitutions for the list of required option courses as long as two or more courses are taught from that option in each academic year. The policy in such cases is,
 - a. In consultation with the Department Head, the Associate Department Head for Graduate Education will appoint a faculty point of contact (POC) from among the EME graduate faculty who practice in the disciplinary area of the degree option.
 - b. Requests to substitute a course for a required course in the applicable option list must be approved by the student's adviser, the POC for the option, and the Associate Department Head for Graduate Education based on the applicability of the proposed substitution to the disciplinary area of the option.
4. At least 6 credits of the required 12 option credits must be taken from the approved list of option core courses in order to earn the option.
5. Special topics courses (597 course numbers) conducted by EME faculty may be accepted as credit towards one or more of the options with the consent of the Associate Department Head for Graduate Education and the POC for the applicable option(s).

Applying Credits to the "Additional Courses" Requirement

6. Depending on individual program, option, and minor curricular selections, it is common for 3 or more credits of "additional courses" to be required for a student to complete the overall requirements for the MS or PhD in Energy and Mineral Engineering.
7. The EME graduate program will accept regular, 500-level, non-seminar courses towards the "additional courses" requirement from the following EME department subject codes: EME, FSC, MNG, MNPR, PNG, EGEE, ENNEC, as well as the list of approved courses included in the appendix of this policy.
8. Outside of 500-level courses in the subject codes listed above, requests to apply course credits towards the EME graduate degree must be approved by the student's adviser and the Associate Department Head for Graduate Education based on their applicability to the field of Energy and Mineral Engineering.

- a. In general, most engineering courses and physical science courses at the 500-level will be accepted towards the “additional courses” requirement.
 - b. Advanced undergraduate courses, at the 400-level, in engineering and the physical sciences may be accepted if they are sufficiently different from the student’s undergraduate course of study. That is, a student may not be approved to repeat undergraduate content and apply that credit applied to their EME graduate degree.
 - c. Other courses, such as law, policy, social sciences, etc. will be accepted based on the courses applicability to Energy and Mineral Engineering, in general, and the student’s research area.
9. Requests to accept more than 6 credits of 400-level courses to any graduate degree will not be approved.
 10. Requests to accept more than 6 credits of 800-level courses to any graduate degree will not be approved.
 11. Requests to accept more than 6 credits of 496/596, independent study credits towards any graduate degree will not be approved.
 12. For transfer courses from another institution, the process outlined in this policy must be followed in addition to the Penn State Graduate School process for transfer credit.
 - a. For transfer courses to be applied to the MS or PhD in EME, they must not have been previously applied towards any completed graduate degree.
 - b. Requests to accept more than 6 credits of transfer courses to any graduate degree will not be approved.

Process

1. A student wishing to make a request for a course substitution or to have a course counted towards the additional courses requirement must complete the EME Graduate Course Petition Form with any required supporting information.
 - a. This form should not be submitted speculatively, but only after the student has registered for the course.
2. The student should sign the form, obtain the signature of their adviser, and then submit the form to the EME graduate office.
3. The EME graduate office will evaluate the form together with the option POC, if required, and issue a response within 2 weeks.
4. Approved graduate course petition forms will be retained in the student’s file.

Forms

EME Graduate Course Petition Form

EME MS-Thesis Checksheet

EME MS-Non-Thesis Checksheet

EME PhD Checksheet

Revision History

2024-03-13 Initial policy approved by vote of the EME graduate faculty.

Appendix: Approved Courses

This appendix includes a list of courses external to EME that have been previously approved as meeting the EME graduate program requirements.

This appendix may be updated by the Associated Head for Graduate Education with the consent of the EME Graduate Program Committee.

Agricultural Economics and Rural Sociology:

- EEFE 510 Econometrics I
- EEFE 511 Econometrics II
- EEFE 512 Applied Microeconomic Theory I
- EEFE 529 Applied Welfare Economics

Aerospace Engineering:

- AERSP 424: Advanced Computer Programming
- AERSP 508 : Foundations of Fluid Mechanics
- AERSP 514: Stability of Laminar Flows
- AERSP 535: Physics of Gases
- AERSP 524: Turbulence and Applications to CFD: DNS and LES
- AERSP 560: Finite Element Method in Fluid Mechanics and Heat Transfer

Chemical Engineering:

- CH E 510: Surface Characterization of Materials
- CH E 524: Chemical Engineering Application of Thermodynamics
- CH E 535: Chemical Reaction Engineering
- CH E 536: Heterogeneous Catalysis
- CH E 544: General Transport Phenomena
- CH E 546: Transport Phenomena II
- CH E 576: Environmental Transport Processes

Civil Engineering:

- C E 555: Groundwater Hydrology: Analysis and Modeling The Finite Element Method
- C E 578: Groundwater Remediation
- C E 561: Surface Hydrology
- C E 563: Systems Optimization Using Evolutionary Algorithms

Computer Science and Engineering:

- CSE 551: Numerical Solution of Ordinary Differential Equations
- CSE 552: Numerical Solution of Partial Differential Equations
- CSE 555: Numerical Optimization Techniques
- CSE 598C: Meshing Techniques

Electrical Engineering:

- E E 561: Information Theory

- E E 560: Probability, Random Variables, and Stochastic Processes
- E E 580: Linear Control Systems
- E E 587: Nonlinear Control and Stability
- E E 597B: Probability and Limit Theorems

Engineering Mechanics:

- E MCH 520: Advanced Dynamics
- E MCH 524 A, B, C: Mathematical Methods in Engineering
- E MCH 530: Mechanical Behavior of Materials
- E MCH 540: Introduction to Continuum Mechanics
- E MCH 560: Finite Element Analysis

Geosciences:

- GEOSC 452: Hydrogeology
- GEOSC 454: Geology of Oil and Gas
- GEOSC 456: Structural Geology
- GEOSC 597 Petroleum Geosystems

Industrial Engineering:

- I E 505: Linear Programming
- I E 511: Experimental Design in Engineering
- I E 516: Applied Stochastic Processes
- I E 521: Nonlinear Programming
- I E 525: Convex Optimization
- I E 583: Response Surface Methodology and Process Optimization

Mechanical Engineering:

- M E 512: Heat Transfer—Conduction
- M E 515: Two-Phase Heat Transfer
- M E 520: Compressible Flow II
- M E 521: Foundations of Fluid Mechanics I
- M E 522: Foundations of Fluid Mechanics II
- M E 523: Numerical Solutions Applied to Heat Transfer and Fluids Mechanics Problems
- M E 535: Physics of Gases
- M E 560: Solid Mechanics
- M E 513: Heat Transfer—Convection
- M E 523: Numerical Solutions Applied to Heat Transfer and Fluid Mechanics Problems
- M E 524: Turbulence and Applications to CFD: DNS and LES
- M E 563: Nonlinear Finite Elements

Statistics:

- STAT 501 Regression Methods
- STAT 515 Stochastic Processes and Monte Carlo Methods
- STAT 540 Statistical Computing
- STAT 557 Data Mining I