



College of Engineering

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Date: 27 March 2015

To: Randy Smith  
Vice Provost, Office of Academic Affairs (OAA)

From: Ed McCaul   
Secretary, College Committee on Academic Affairs (CCAA)

Subject: Engineering Sciences Minor

CCAA has reviewed and approved the attached Engineering Sciences Minor on the 26th of March 2015. This minor is being submitted to you as required by the university's new minor policy. If you have any questions concerning this minor please let me know.



College of Engineering

244 Hitchcock Hall  
2070 Neil Avenue  
Columbus, OH 43210

(614) 292-7923 Phone  
(614) 247-6255 Fax

[eeic.osu.edu](http://eeic.osu.edu)

March 11, 2015

To: CCAA

From: Lisa M. Abrams  
Associate Director  
Engineering Education Innovation Center

RE: Request to change Engineering Sciences Minor

I am requesting your approval of proposed changes and an exception to University policy to the Engineering Sciences Minor (ESM). The rationale for the change is to have ESM in full compliance with the new University policies on minors. This minor is designed for non-engineering students with an interest in learning more about technology's role in today's society; and who may be working with engineers in the future.

The requested exception to University policy is to allow four credit hours counted toward the minor to be at 1000-level

The exception request accounts for the ESM core curriculum component to be within our Fundamentals of Engineering course sequence. This sequence is an important first year sequence required for all engineers and should also be required for non-engineers pursuing the minor.

Changes to the curriculum sheet include updated statements reflecting the University overlap policies with respect to GE courses, between minors and with the major. A curriculum component was removed since the material was adequately covered in the first year course sequence. It is now required that ESM students take two semesters (rather than "at least one") of the Capstone Collaboration course in order to fully benefit from the project experience.

We propose that students declaring the minor in Autumn 2015 will follow the new curriculum sheet. We will allow any student who has already declared the minor to complete the requirements from the current curriculum sheet. The current and proposed ESM Curriculum sheets are included.

## Engineering Sciences Minor

Advising Sheet (Semesters)

The Ohio State University

College of Engineering

Approved by the Colleges of the Arts and Sciences

Revised January 2012, February 17, 2012, 16 April 2012

### College of Engineering

Engineering Education Innovation Center (EEIC)

<http://engineering.osu.edu/eEIC/index.php>

244 Hitchcock Hall; 2070 Neil Ave

Columbus, OH 43210-1278; 614-247-8953

Advisor: Robert J. Gustafson

This minor is designed for non-engineering students with an interest in learning more about technology's important role in today's society; and who may be working with engineers and technology based opportunities in the future. Specific learning goals include:

- Develop a basic understanding of the engineering design process
- Understand the capabilities and limitations of technologies and engineered systems
- Be able to make informed decisions about engineering activities and technologies
- Be able to work effectively as a member of a team including technology experts

The program advisor will work with you on selection of a suitable minor program to meet your specific career objectives. Upon completion of the minor, the advisor will approve and sign the Minor Program Form. You may then file the Minor Program Form with your college or school to receive a minor in Engineering Sciences.

### Key Curriculum Components

- Core - Introduction to Engineering (4-8 credits)
- Complementary Engineering Science (2 credit minimum)
- Computational Technology Competence (2credits minimum)
- Technology and Society (3 credits)
- Capstone interdisciplinary teamwork experience (3-6 credits)
- Total Credits (14 credit minimum)

### Note for students in the minor:

You will be expected to complete a first calculus course (e.g., Math 1131 or 1151). This course will fulfill the math requirement of all courses for the minor. Other prerequisites will depend on courses selected.

**Core** of the Engineering Sciences Minor is the Introduction to Engineering course sequence:

ENGINEER 1181.01 or .02 and ENGINEER 1182.01 or .02 or .03 (Honors substitute permitted; 1281.01 or .02 or .03H and 1282.01 or .02 or .03H): 4-8 hours.

ENGINEER 1181.xx - Fundamentals of Engineering I

Engineering problem solving utilizing computational tools such as Excel and Matlab; hands-on experimentation; ethics; modeling; teamwork; written, oral and visual communications.

ENGINEER 1182.xx - Fundamentals of Engineering2

3-D visualization and sketching; introduction to CAD; engineering design-build; teamwork; written, oral and visual communications; and project management.

**Engineering Science Options: 2 Credit Hours Minimum**

AEROENG 2200, CIVILENG 2050, FABENG 2110, 3810, DESIGN 3105, ISE 2000, 2010, 2400, 2500, MATSCEN 2010, Other Engineering courses by permission of the Minor Coordinator

**Computation Technologies Options: 2 Credit Hours Minimum**

CSE 1111,1112,1113, 1211, 1221, 1222 or 1223, or 2221, ENGINEER 1221,1222 1281.01, 1281.02, or 1281.03

**Technology and Society Options: 3 Credit Hours**

Comparative Studies 2340, 2367.04, ENGINEER 2360.01, 2360.02, 2367, History 2701, Physics 2367, SOC 3302

**Capstone Experience: 3-6 Credit Hours**

ENGINEER 5081- Engineering Capstone Collaboration

Students contract to collaborate with an engineering capstone design team for at least one semester and contribute their disciplinary expertise.

### General Guidelines

Required for graduation No

Credit hours required A minimum of 14

Filing the Minor Program form A Minor Program form must be filled out no later than the time the application for graduation is submitted to a college/school counselor. It will require the signature of the student and the student's major program advisor.

Changing the minor Once the minor has been filed, any changes must be approved by the Chair of the Minor Oversight Committee. This form will be available on the CoE website

Grades required No grade below a C- will be permitted in courses comprising the minor.

A minimum 2.00 cumulative point-hour ratio is required for the minor.

Course work graded Pass/Non-pass cannot count on the minor.

Transfer credit hours allowed No more than 6 hours of transfer credit may be applied to the minor.

Overlap with the GEC Permitted.

Overlap Policy The College of Engineering places no restrictions on the use of a course both in a minor and major program. However, students should consult their major program for any constraints that may be applied there.

Exclusions to minor Not open to Engineering majors.

### Additional Guidelines for ASC Students

Overlap between minors Each minor completed must contain 12 unique hours.

Overlap with the major Not allowed and the minor must be in a different subject than the major

# Engineering Sciences Minor

Advising Sheet

The Ohio State University College of Engineering

Revised January 2012, February 2012, April 2012, May 2014, February 2015

## College of Engineering

Engineering Education Innovation Center (EEIC)

<http://engineering.osu.edu/eic/index.php>

244 Hitchcock Hall; 2070 Neil Ave

Columbus, OH 43210-1278; 614-247-8953

Advisor: Dr. Lisa M. Abrams

Email: [Abrams.34@osu.edu](mailto:Abrams.34@osu.edu)

This minor is designed for non-engineering students with an interest in learning more about technology's important role in today's society; and who may be working with engineers and technology based opportunities in the future. Specific learning goals include:

- Develop a basic understanding of the engineering design process
- Understand the capabilities and limitations of technologies and engineered systems
- Be able to make informed decisions about engineering activities and technologies
- Be able to work effectively as a member of a team including technology experts

The program advisor will work with you on selection of a suitable minor program to meet your specific career objectives. Upon completion of the minor, the advisor will approve and sign the Minor Program Form. You may then file the Minor Program Form with your college or school to receive a minor in Engineering Sciences.

### Key Curriculum Components

- Core - Introduction to Engineering (4 credits)
- Engineering Science (2-4 credits)
- Technology and Society (3 credits)
- Capstone interdisciplinary teamwork experience (6 credits)
- Total Credits (15-17 credit minimum)

**Note for students in the minor:** You will be expected to complete a first calculus course (e.g., Math 1131 or 1151). This course will fulfill the math requirement of all courses for the minor. Other prerequisites will depend on courses selected.

**Core: 4 Credit Hours:** The Engineering Sciences Minor contains the Introduction to Engineering course sequence ENGR 1181.01 or .02 and ENGR 1182.01, .02 or .03 (Honors substitute permitted.)

#### ENGR 1181.xx - Fundamentals of Engineering 1

Engineering problem solving utilizing computational tools such as Excel and Matlab; hands-on experimentation; ethics; modeling; teamwork; written, oral and visual communications.

#### ENGR 1182.xx - Fundamentals of Engineering 2

3-D visualization and sketching; introduction to CAD; engineering design-build; teamwork; written, oral and visual communications; and project management.

### Engineering Science Options: 2-4 Credit Hours

If no prior courses in Engineering, choose from: AVIATN 2000, BIOMEDE 2000, DESIGN 3105, ISE 2500, other Engineering courses by permission of the Minor Advisor.

For students who have taken OSU Engineering courses, choose from: AEROENG 2200, CBE 2200, CIVILEN 2050, CSE 2221, ECE 2000, ENVENG 3200, FABENG 2100, ISE 2400, MATSCEN 2010, MECHENG 2010, WELDENG 3001, other Engineering courses by permission of the Minor Advisor.

### Technology and Society Options: 3 Credit Hours

COMPSTD 2340, 2367.04, ENGR 2361, 2362, 2367, HISTORY 2701, PHYSICS 2367, SOCIOL 3302

### Capstone Experience: 6 Credit Hours

*ENGR 5081.01 and ENGR 5081.02- Engineering Capstone Collaboration* Students contract to collaborate with an engineering capstone design team for two semesters and contribute their disciplinary expertise.

### General Guidelines

- **Required for graduation:** No
- **Credit hours required:** A minimum of 12
- **Filing the Minor Program form:** A Minor Program form must be filled out no later than the time the application for graduation is submitted to a college/school counselor. It will require the signature of the student and the student's major program advisor
- **Changing the minor:** Once the minor has been filed, any changes must be approved by the Minor Advisor. This form is available on the College of Engineering website
- **Grades required:** No grade below a C- will be permitted in courses comprising the minor
- A minimum 2.00 cumulative point-hour ratio is required for the minor
- Course work graded Pass/Non-pass cannot count on the minor
- No more than 3 hours of course work graded Satisfactory/Unsatisfactory may count toward the minor
- No more than 3 hours of xx93 allowed
- **Transfer credit hours allowed:** No more than 6 hours of transfer credit may be applied to the minor
- **Overlap with GE courses:** No more than 6 hours can overlap
- **Overlap between minors:** Each minor completed must contain 12 unique hours
- **Overlap with the major:** Not allowed and the minor must be in a different subject than the major
- **Exclusions to minor:** Not open to Engineering majors