MINOR IN ENGINEERING DESIGN

Program Learning Outcomes for the Minor in Engineering Design

Upon completing the minor in Engineering Design, students will be able to:

1. Execute steps of the engineering design process including problem identification, needs assessment, context review, defining design criteria, idea generation, solution selection, iterative prototyping, and testing.
2. Become familiar with other steps of the engineering design process including market assessment, design for manufacturing, field testing, and implementation.
3. Apply technical knowledge from their major within the School of Engineering to solve a design challenge.
4. Develop breadth in design by working on at least two different design projects.
5. Work in multiple teams, filling the role of a team member and a team leader.
6. Apply project planning tools to guide design projects.
7. Communicate effectively their design problems and solutions through written, oral, and visual communication tools to a wide variety of audiences.
8. Become proficient in low and high fidelity physical and digital-based prototyping.

Requirements for the Minor in Engineering Design

Students pursuing the minor in Engineering Design must complete:

- A minimum of 6 courses (18 credit hours) to satisfy minor requirements.

Students are encouraged to begin taking courses in the minor during their freshman year, and are encouraged to declare the minor no later than the beginning of their fifth semester.

The courses listed below satisfy the requirements for this minor. In certain instances, courses not on this official list may be substituted upon approval of the minor's academic advisor, or where applicable, the Program Director. (Course substitutions must be formally applied and entered into Degree Works by the minor's Official Certifier (https://registrar.rice.edu/facstaff/degreeworks/officialcertifier/)). Students and their academic advisors should identify and clearly document the courses to be taken.

Summary

Code	Title	Credit Hours
Total Credit Hours Required for the Minor in Engineering Design		18

Minor Requirements

Code	Title	Credit Hours
Core Requirements		
Select 1 course from the following:		*3*
ENGI 120	INTRODUCTION TO ENGINEERING DESIGN	
ENGI 220	INTRODUCTION TO ENGINEERING DESIGN II	
FWIS 188	INTRODUCTION TO ENGINEERING DESIGN AND COMMUNICATION	
ENGI 200	ENGINEERING DESIGN STUDIO	3
ENGI 210	PROTOTYPING AND FABRICATION	3
ENGI 350	NEEDS IDENTIFICATION AND DESIGN IMPLEMENTATION	3
Elective Requirements		
Select 2 courses (and a minimum of 6 credit hours) from the following: [1]		*6*
BIOE 360 / GLHT 360	APPROPRIATE DESIGN FOR GLOBAL HEALTH	
BUSI 221 / ENGI 221	NEW ENTERPRISES: DISCOVERY	
BUSI 463	ENTREPRENEURIAL STRATEGY	
CEVE 314 / BIOE 365 / GLHT 314	SUSTAINABLE WATER PURIFICATION FOR THE DEVELOPING WORLD	
CHBE 490	CHEMICAL CAR ENGINEERING AND DESIGN	
ELEC 327	IMPLEMENTATION OF DIGITAL SYSTEMS	
ELEC 442	INTRODUCTION TO ANALOG INTEGRATED CIRCUITS	
ELEC 491	UNDERGRADUATE ELECTRICAL ENGINEERING RESEARCH PROJECTS-VERTICALLY INTEGRATED PROJECTS [2]	
ENGI 300	ENGINEERING DESIGN WORKSHOP	
ENGI 301	INTRODUCTION TO PRACTICAL ELECTRICAL ENGINEERING	
ENGI 315	LEADING TEAMS AND INNOVATION	
ENGI 355	DIGITAL DESIGN AND VISUALIZATION	
MECH 203	MECHANICAL ENGINEERING DESIGN TOOLS	
MECH 488	DESIGN OF MECHATRONIC SYSTEMS	
PSYC 370	INTRODUCTION TO HUMAN FACTORS AND ERGONOMICS	
Additional Requirement		
Students must participate in at least two different design projects during their undergraduate experience. [3]		
Total Credit Hours		**18**

Footnotes and Additional Information

[1] With minor advisor approval, students may also complete departmental design courses or project-based courses, excluding capstone or final-year design coursework, to satisfy the Electives Requirement.

[2] With minor advisor approval, students may receive a maximum of 3 credit hours for ELEC 491.

[3] The design projects requirement is in place to ensure that students have some breadth in their practice of design. This can be satisfied by a project completed while taking the courses listed in the Electives Requirement and/or a capstone design course. Note that while a capstone design course may be required by the student's major (e.g., BIOE 451 and BIOE 452, MECH 407 and MECH 408, ELEC 494, etc.) that capstone design course may NOT count as an elective in the Engineering Design minor. However, a project completed in these major-required courses may count as a second design project for this minor. For example, a student may work on one project in ENGI 120 and ENGI 200 and then a second project in the major-required capstone course, such as CHBE 404. ENGI 120 and ENGI 200 may be used to count toward minor requirements, whereas CHBE 404 would not count toward the minor requirements. However, the projects completed in ENGI 120, ENGI 200, and CHBE 404 could be used to fulfill the design projects requirement. Please see the minor advisor regarding the design projects requirement.

Policies for the Minor in Engineering Design

Admission

Rice students who are pursuing a B.A. or B.S. degree in the School of Engineering are best prepared to pursue the minor in Engineering Design. Many courses that can be applied towards the minor requirements are open to all Rice students, including those not pursuing the minor in Engineering Design. For ENGI 200 and ENGI 300, students must explain their interest and reasons for taking the course in order to gain instructor permission. Preferential admission will be given to students who indicate they are seeking to complete the minor in Engineering Design.

Program Restrictions and Exclusions

Students pursuing the minor in Engineering Design should be aware of the following program restriction:

- As noted in Majors, Minors, and Certificates (https://ga.rice.edu/undergraduate-students/academic-opportunities/majors-minors-certificates/), i.) students may declare their intent to pursue a minor only after they have first declared a major, and ii.) students may not major and minor in the same subject.

Transfer Credit

For Rice University's policy regarding transfer credit, see Transfer Credit (https://ga.rice.edu/undergraduate-students/academic-policies-procedures/transfer-credit/). Some departments and programs have additional restrictions on transfer credit. The Office of Academic Advising maintains the university's official list of transfer credit advisors (https://oaa.rice.edu/advising-network/transfer-credit-advisors/) on their website: https://oaa.rice.edu. Students are encouraged to meet with their academic program's transfer credit advisor when considering transfer credit possibilities.

Program Transfer Credit Guidelines

Students pursuing the minor in Engineering Design should be aware of the following program-specific transfer credit guidelines:

- Requests for transfer credit will be considered by the program director (and/or the program's official transfer credit advisor) on an individual case-by-case basis.

Additional Information

For additional information, please see the Engineering Design website: http://oedk.rice.edu/minor (http://oedk.rice.edu/minor/)

Opportunities for the Minor in Engineering Design

Academic Honors

The university recognizes academic excellence achieved over an undergraduate's academic history at Rice. For information on university honors, please see Latin Honors (https://ga.rice.edu/undergraduate-students/honors-distinctions/university/) (*summa cum laude*, *magna cum laude*, and *cum laude*) and Distinction in Research and Creative Work (https://ga.rice.edu/undergraduate-students/honors-distinctions/university/). Some departments have department-specific Honors awards or designations.

Additional Information

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