

Performance Indicators

A: An ability to apply knowledge of mathematics, science, and engineering.

1. Select appropriate model for the problem.
2. Prepare a solution that exhibits logical sequence of steps that are consistent with the model.
3. Demonstrate a correct solution to the problem.
4. Present solution in appropriate format.

Assessment

1. EE: Student work in EECE 3240 (Direct).
2. CpE: Student work in EECE 4278 (D).
3. EECE: Student Work in EECE 3203 (D).
4. EECE: Student Work in EECE 3270 (D).
5. Prerequisite Exams in EECE 2207, 2201, 2222, 3201 (D).
6. Senior survey (Indirect).

B: An ability to design and conduct experiments, as well as to analyze and interpret data.

1. Design an experiment to investigate an engineering problem.
2. Choose appropriate tools for the experiment.
3. Employ tools to conduct the experiment.
4. Analyze experimental results using appropriate methods.
5. Evaluate significance of experimental results.
6. Present details of experiment in appropriate format.

Assessment

1. EECE 3211 Lab report (D).
2. EECE 4991: Project test plan and implementation (D).
3. EECE 4280: Senior Design test plan and implementation (D).
4. Senior survey (I).

C: An ability to design a system, component, or process to meet desired needs within realistic constraints, such as economic, environmental, social, political, ethical, health and safety, manufacturability, and sustainability.

1. Identify need for the design.
2. Identify multiple, realistic constraints on the design.
3. Identify appropriate engineering standards for the design.

4. Based on knowledge and skills acquired in earlier course work, create a design that satisfies needs and constraints, and that conforms to engineering standards.
5. Compare design with other potential solutions.
6. Evaluate the feasibility and effectiveness of the design, and extent to which the design satisfies needs, constraints, and engineering standards.
7. Demonstrate design on a completed prototype.
8. Present results clearly and professionally.

Assessment

1. EECE 3204 Design project (D).
2. EECE 4280 Senior design report (D).
3. EECE 4280 Senior design presentation (D).
4. EECE 4991 Project design and implementation (D).
5. Senior survey (I).

D: An ability to function on multidisciplinary teams.

1. Demonstrate individual accountability for the team's success through encouragement, assistance, constructive criticism, timely completion of assigned tasks, participation in team activities, and communication among team members.
2. Demonstrate good teamwork by all members contributing significantly to the team's goals.
3. Demonstrate an appreciation of the contribution of other disciplines to the team.

Assessment

1. EECE 4280 Senior design report (D).
2. EECE 3201 Lab/Project team evaluation (D).
3. EECE 4280 Peer reviews (I).
4. EECE 3270 Lab/Project team evaluation (D).
5. Senior survey (I)

E: An ability to identify, formulate, and solve engineering problems.

1. Identify appropriate model for the problem.
2. Prepare a solution that exhibits logical sequence of steps that are consistent with the model.
3. Demonstrate a correct solution to the problem.
4. Compare alternative solutions to the problem.
5. Present solution in appropriate format.

Assessment

1. EE: Student work in EECE 3240 (D).

2. CpE: Student work in EECE 4278 (D).
3. EECE: Student Work in EECE 3203 (D).
4. EECE: Student Work in EECE 3270 (D).
5. Prerequisite Exams in EECE 2207, 2201, 2222, 3201 (D).
6. Senior survey (Indirect).

F: An understanding of professional and ethical responsibility.

1. Recognize an ethical dilemma.
2. Define elements of an professional and technical codes of ethics, such as IEEE, NSCP, ...
3. Define intellectual property (e.g. copyright, trade secrets, patents)
4. Apply code of ethics to realistic case study.
5. Judge consequences of different choices on involved parties.

Assessment

1. EECE 4279 ethics exam (D).
2. EECE 3204 paper (D).
3. Senior Survey.

G: An ability to communicate effectively.

1. Demonstrate effective written communication skills – Organization, content, grammar, appearance, and format.
2. Demonstrate effective oral presentation skills – Organization, content, multi-media, appearance, and delivery.

Assessment

1. EECE 3204 paper (D).
2. EECE 4280 senior design presentation (D).
3. EECE 4280 senior design report (D).
4. EECE 4991 Paper (D).
5. Senior survey (I).

H. The broad education necessary to understand the impact of engineering solutions in a global, economic, environmental, and societal context.

1. List examples of the impact of engineering in a global, economic, environmental, and societal context.
2. Demonstrate knowledge of the responsibilities of an engineer in a global, economic, environmental, and societal context.
3. Demonstrate respect for diversity of peoples, ideas, and cultures.

Assessment

1. EECE 4279 Contemporary Issues Debate (D).

2. Written student reactions to seminars in EECE 4279 (D).
3. EECE 4991 Paper (D).
4. UofM General Education Requirements (I).
5. Senior survey (I).

I: A recognition of the need for, and an ability to engage in life-long learning.

1. Participate in professional development, professional society activities, or other programmatic extracurricular projects.
2. Progress towards professional licensure or certification.
3. Analyze the knowledge and skills needed at the beginning of a project and develop strategies to acquire the missing knowledge or skills.

Assessment

1. Percentage of students taking the FE (I).
2. Percentage of students participating in student societies (IEEE) (I).
3. Faculty evaluation of EECE 4991 Projects and ability to apply new skills (D).
4. Faculty evaluation of EECE 4280 Projects and ability to apply new skills (D).
5. Written student reactions to seminars in EECE 4279 (D)
6. Senior survey (I).

J. A knowledge of contemporary issues.

1. Discuss contemporary issues as they relate to the engineering profession.
2. Demonstrate a depth of knowledge of a contemporary issue and its impact.
3. Defend a position on a controversial contemporary issue.

Assessment

1. EECE 4279 Contemporary Issues Debate (D).
2. Written student reactions to seminars in EECE 4279 (D).
3. EECE 4991 Paper (D).
4. Senior survey (I)

K. An ability to use the techniques, skills, and modern engineering tools necessary for engineering practice.

1. Demonstrate the use of appropriate tools for a given application.
2. Demonstrate the use of outside resources to advance or improve a solution.
3. Demonstrate safe, appropriate, and effective use of laboratories to solve engineering problems.

Assessment

1. EECE 4280 senior design report (D).
2. EECE 3203 MATLAB project report (D)
3. EECE 3201 lab practical (D)
4. EECE 3211 PSpice Simulations (D)
5. Senior survey (I)