**Student Outcome (a) APPLICATION: an ability to apply knowledge of mathematics, science, and engineering**

- (i) The student solves engineering problems that require advanced math skills.
- (ii) The student applies fundamental scientific and engineering principles to solving engineering problems.

**Student Outcome (b) EXPERIMENTATION: an ability to design and conduct experiments, as well as to analyze and interpret data**

- (i) The student designs an experiment and carries it out.
- (ii) The student analyzes data and draws conclusions based on those data and their uncertainty.

**Student Outcome (c) DESIGN: 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**

- (i) The student recognizes customer needs, selects appropriate modern tools, and evaluates and selects design concepts or response to stated design requirements.
- (ii) The student develops, tests, and iteratively refines a design to meet desired needs and requirements.
- (iii) The student helps to synthesize individual contributions into a coherent whole.
- (iv) The student recognizes and utilizes the diverse skills and knowledge of team members.

**Student Outcome (d) TEAMWORKING: an ability to function on multidisciplinary teams**

- (i) The student recognizes and utilizes appropriate grammar and format, effectively articulates ideas, and collaborates with others.
- (ii) The student articulates stakeholder needs, realistic constraints, and relevant design requirements for engineering projects.
- (iii) The student designs an experiment and carries it out.

**Student Outcome (e) PROFESSIONAL RESPONSIBILITY AND ETHICS: an understanding of professional and ethical responsibility**

- (i) The student demonstrates an awareness of professional ethics.
- (ii) The student is able to evaluate the ethical dimensions of an engineering problem.
- (iii) The student is able to evaluate the ethical dimensions of an engineering problem.

**Student Outcome (f) COMMUNICATION: an ability to communicate effectively**

- (i) The student recognizes and utilizes appropriate and effective oral and written presentation ideas and demonstrates appropriate, professional style of the audience.
- (ii) The student articulates ideas and expresses an effective oral presentation using appropriate audience techniques and demonstrates appropriate style for the audience.
- (iii) The student presents concepts utilizing a graphical representation.

**Student Outcome (g) LIFE-LONG LEARNING: a recognition of the need to, and ability to engage in life-long learning**

- (i) The student is able to articulate gaps in their knowledge.
- (ii) The student is able to make progress in filling knowledge gaps through self-identified learning opportunities.

**Student Outcome (h) CONTEMPORARY ISSUES: a knowledge of contemporary issues**

- (i) The student recognizes that engineering work has both technical and societal implications.

**Student Outcome (i) MODERN TOOLS: an ability to use the techniques, tools, and modern engineering tools necessary for engineering practice**

- (i) The student demonstrates an ability to use modern tools for data analysis.
- (ii) The student demonstrates an ability to use modern tools for material modeling or data analysis.

**Student Outcome (j) INFORMATION LITERACY: an ability to determine information needs**

- (i) The student recognizes current published works and data according to prescribed citation guidelines.
- (ii) The student comprehends current published works and data.

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**KEY:**

Always Covered/Supported: CEE 100, EGR 110, EGR 220, EGR 270, EGR 290, EGR 312, EGR 320, EGR 322, EGR 346, EGR 350, EGR 351, EGR 363, EGR 372, EGR 373, EGR 374, EGR 375, EGR 388, EGR 389.