ENGR 13200
TRANSFORMING IDEAS TO INNOVATION II

Course Outcomes [Related ME Program Outcomes in Brackets]

1. Develop a logical problem-solving process that includes sequential structures, conditional structures, and repetition structures for fundamental engineering problems. [A1, A2]
2. Translate a written problem statement into a mathematical model. [A2]
4. Employ design and problem processes in modeling, problem-solving, and design work. [A5]
5. Work effectively and ethically as a member of a technical team. [B2, B3]
6. Develop a work ethic appropriate to the engineering profession. [B3]
7. Evaluate and provide feedback to improve solutions to engineering problems. [A5]
8. Reflect on personal and team performance to achieve continuous improvement. [B2]
9. Demonstrate an ability to engage in continuing professional development. [B1, B2]

MATLAB Programming Skills
1. Vector and Array Manipulations
2. Relational/Logical Operations
3. Decision/Repetition Structures
4. User-Defined Functions
5. Graphical-User Interfaces (GUIs)

Mathematical Modeling
1. Problem Formulation
2. Iterative Model Creation/Development/Evaluation
3. Model Argumentation/Justification
4. Model Communication

Data Analysis
1. Data Representations
2. Descriptive Statistics
3. Linear Regression
4. Function Forms & Discovery

Engineering Design (GUI Design)
1. Problem Formulation
2. Information Gathering
3. Idea Generation
4. Iterative Prototype Creation/Development/Evaluation
5. Prototype Review with Client

Problem-Solving
1. Evidence-Based Decisions
2. Flowcharting and Logical Decision-Making
3. Flowchart to programming algorithm conversion
1. **COURSE NUMBER AND NAME:** ENGR 13200 Transforming Ideas to Innovation II

2. **CREDITS AND CONTACT HOURS:** 2 credits
   a. Studio – 2 day per week at 110 minutes for 16 weeks

3. **COURSE COORDINATOR OR INSTRUCTOR:**
   H. Diefes-Dux

4. **TEXTBOOK:**
   On-Line Modules

5. **SPECIFIC COURSE INFORMATION:**
   a. **Course Description:** A partnership between Schools and Programs within the College of Engineering continues building on the foundation developed in ENGR 13100. Students take a more in depth and holistic approach to integrating multiple disciplines perspectives while constructing innovative engineering solutions to open-ended problems. Extending skills in project management engineering fundamentals, oral and graphical communication, logical thinking, team work, and modern engineering tools (e.g., Excel, and MATLAB).

   b. **Prerequisites:**
      ENGR 13100 – Transforming Ideas to Innovation I (grade of “C” or better)

   c. **Status:** Required

6. **SPECIFIC GOALS FOR THE COURSE**
   a. **Course Outcomes:** [Related ME Program Outcomes in Brackets]
      1. Develop a logical problem-solving process that includes sequential structures, conditional structures, and repetition structures for fundamental engineering problems. [A1, A2]
      2. Translate a written problem statement into a mathematical model. [A2]
      4. Employ design and problem processes in modeling, problem-solving, and design work. [A5]
      5. Work effectively and ethically as a member of a technical team. [B2]
      6. Develop a work ethic appropriate to the engineering profession. [B3]
      7. Evaluate and provide feedback to improve solutions to engineering problems. [A5]
      8. Reflect on personal and team performance to achieve continuous improvement. [B2]
      9. Demonstrate an ability to engage in continuing professional development. [B1, B2]

   b. **Related ME Program Outcomes:** [Related ABET Outcomes Listed in Brackets]
      A1. Engineering Fundamentals; B3. Prof/Ethical Responsibility;
      A3. Experimental Skills; B5. Life-Long Learning;
      A4. Modern Engr Tools; C1. Leadership;
      A5. Design Skills; C2. Global Engineering Skills;
      A6. Impact of Engr Solns; C3. Innovation;
      B1. Communication Skills; C4. Entrepreneurship
      B2. Teamwork Skills

7. **LIST OF TOPICS:** See following page.