## ME 457 COURSE PROFILE

**DEGREE PROGRAM:** Mechanical Engineering

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| **COURSE NUMBER:** ME 457 | **COURSE TITLE:** Front-End Design |
| **REQUIRED COURSE OR ELECTIVE COURSE:** Elective | **TERMS OFFERED:** Fall |
| **TEXTBOOK / REQUIRED MATERIAL:** Course Pack | **PRE / CO-REQUISITES:** MECHENG 350 or equivalent design course (3 credits). |
| **COGNIZANT FACULTY:** S. Daly | **COURSE TOPICS:** |
| **BULLETIN DESCRIPTION:** This course examines processes of front-end of engineering design, including opportunity discovery, problem definition, developing mechanisms to gather data from users and other stakeholders, translating user data into design requirements and specifications, creating innovative solutions during concept generation, representing design ideas, and evaluating possible solutions. | 1. Opportunity discovery.<br>2. Problem definition and design requirements.<br>3. Stakeholder identification.<br>4. User/stakeholder data collection.<br>5. Design representations and evaluation.<br>6. Design iteration and reflection. |
| **COURSE STRUCTURE/SCHEDULE:** | |

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| **COURSE OBJECTIVES:**<br><br>**for each course objective, links to the Program Outcomes are identified in brackets.** | 1. Teach students to discover and refine design problems/opportunities and solution ideas based on users, stakeholders, and contexts [1, 2, 4].<br>2. Introduce theories and approaches of engineering and engineering design, as well as an understanding how design approaches span multiple disciplines [1, 2, 3, 4, 5].<br>3. Generate student engagement with peers and community members to identify and justify a design problem, solution ideas, and contextual and stakeholder influences [2, 4, 5].<br>4. Teach students to synthesize information from literature in the context of one or more stages of the design front-end [2, 3, 4, 7]. |
| **COURSE OUTCOMES:**<br><br>**for each course outcome, links to the Course Objectives are identified in brackets.** | 1. Able to provide data, justification, and constraints on design problems [1, 3].<br>2. Able to identify stakeholders relevant to design problems [1, 2, 3].<br>3. Able to generate contextual information on design problems [1, 3, 4].<br>4. Able to generate solution ideas and perform concept evaluation using contextual information [3].<br>5. Able to communicate design problem background including social, contextual, and technical information [2, 4].<br>6. Able to identify literature from external sources relevant to design problems [3, 4]. |
| **ASSESSMENT TOOLS:**<br><br>**for each assessment tool, links to the course outcomes are identified** | 1. Homework assignments [1-6].<br>2. Project work. [1-6]<br>3. Didactic examinations [1-4]<br>4. Community engagement [2, 5] |

**PREPARED BY:** P. Papalambros, ASO Staff
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