

Course Description**EET4165C | Senior Design 1 | 3.00 credits**

This project-based course is designed to synthesize students' knowledge of the analysis, design, manufacturing, and testing of electronic systems. Students will design experiments, explore professional ethics, practice professional oral and written communications, conduct project feasibility studies, write proposals, employ system design methodology, and perform project scheduling. Students learn about human factors, intellectual property, and liability issues.

Course Competencies

Competency 1: The student will demonstrate the ability to define an engineering project by:

1. Defining the goals and objectives of the project
2. Identifying qualified team members and establishing groups
3. Identifying resources, materials, and costs
4. Scheduling major project milestones
5. Identifying time and cost constraints
6. Conducting stakeholder listening sessions to fine-tune project definitions.
7. Identifying project deliverables

Competency 2: The student will demonstrate an understanding of project management scheduling by:

1. Discussing the advantages and disadvantages of various scheduling methods such as Gantt, PERT, CPM
2. Selecting an appropriate scheduling method for a project given the project definition
3. Scheduling activities between milestones
4. Distinguishing between flexible and inflexible task constraints and assigning constraints as appropriate
5. Using project management scheduling software to schedule and track the project

Competency 3: The student will demonstrate the ability to write technical documents by:

1. Preparing project proposals
2. Analyzing the components of project documents, such as: relevant literature, specifications, similar technology, project description, project design diagrams, graphs, and charts, patent processes
3. Incorporating, managing, and tracking revisions
4. Applying specific corporate/institutional standards to the document
5. Following government standards and procedures as appropriate, e.g., FDA, NRC, etc.
6. Monitoring project costs
7. Monitoring the progress of a project
8. Implementing contingency actions, as required
9. Establishing and implementing contingency plans

Competency 4: The student will demonstrate an understanding of the ethical issues involved in designing and building an electronic/electrical system by:

1. Summarizing the fundamental canons of the National Society of Professional Engineers (NSPE) code of ethics for engineers
2. Discussing the professional responsibilities of engineers not to participate in any practices regarding the design, development, approval, and implementation of systems which may result in endangering the property, lives, safety, health, or welfare of the general public
3. Identifying and discussing how to perform professional duties objectively and impartially and situations that may represent or lead to a conflict of interest
4. Analyzing case studies to determine the ethical issues involved and proposing appropriate behaviors, actions, and responses to real-life case studies
5. Distinguishing between appropriate and inappropriate professional behaviors
6. Describing standards of competence as they relate to an engineer's ability to perform required services

7. Discussing intellectual property rights and describing what constitutes intellectual property rights infringement
8. Distinguishing under what circumstances an engineer may or may not reveal confidences and private information
9. Discussing the ethical issues involved in securing engineering assignments and in the competitive bidding process

Competency 5: The student will manage an engineering project by:

1. Conducting status meetings with stakeholders
2. Assigning tasks to individuals
3. Establishing contracts
4. Writing progress reports on the project
5. Delivering the completed product on time and within budget

Competency 6: The student will demonstrate the ability to work in teams by:

1. Functioning as a team leader
2. Functioning as a team member
3. Identifying tasks and assigning appropriate personnel for tasks
4. Coordinating milestones with team members to achieve project deadlines

Competency 7: The student will practice project administration by:

1. Conducting briefing and de-briefing sessions with the project team
2. Identifying union or labor policies and practices involved in the project, if applicable
3. Brainstorming with team members to anticipate roadblocks and identify solutions
4. Documenting the project through reports, photographs, etc.
5. Preparing and delivering a presentation on the project

Learning Outcomes

- Use quantitative analytical skills to evaluate and process numerical data
- Solve problems using critical and creative thinking and scientific reasoning
- Formulate strategies to locate, evaluate, and apply information