

SYSTEMS ENGINEERING INNOVATION G/T ESSENTIAL CURRICULUM

Unit I: Engineering Software

Goal: The student will demonstrate the ability to apply relevant engineering software and analysis skills and tools (e.g., MATLAB, Simulink, SolidWorks, Autodesk Revit and Autodesk Civil Engineering).

Objectives - The student will be able to:

- a. Complete tutorials.
- b. Select and use appropriate software to solve problems.
- c. Utilize tools to enhance design characteristics of a project.
- d. Create spreadsheets and analyze projects.

Unit II: Engineering Career Research

Goal: The student will demonstrate the ability to apply career opportunities related to seminar experiences.

Objectives - The student will be able to:

- a. Discuss job prerequisites and educational requirements.
- b. Identify and explore industry related work environments of interest.
- c. Identify and accurately define problems related to workplace issues.
- d. Solve authentic, industry-related problems.
- e. Acquire and apply appropriate resources for research and senior project.
- f. Use industry specific technologies, materials and knowledge.

Unit III: Preparing for an Internship

Goal: The student will demonstrate the ability to participate in a meaningful internship at a local engineering firm focused on the students' career area of interest.

Objectives - The student will be able to:

- a. Identify and explore industry related work environments of interest.
- b. Investigate future career options.
- c. Identify and accurately define problems related to workplace issues.
- d. Apply problem-solving strategies to authentic problems related to workplace issues.
- e. Identify an industry related research topic.
 - Acquire and utilize appropriate resources
 - Demonstrate an understanding of the research process
 - Interpret technical literature and documentation
 - Use industry specific technologies, materials and knowledge.

Unit IV: Internship Experience

Goal: The student will demonstrate the ability to display professional attitudes and behaviors in the work environment.

Objectives - The student will be able to:

- a. Set realistic goals.
- b. Establish timelines.
- c. Communicate responsibly.
- d. Recognize the importance of professional behavior.
- e. Demonstrate self-direction.
- f. Adhere to industry specific dress codes.
- g. Demonstrate enthusiasm and commitment to workplace expectations.
- h. Display personal responsibility and ethical behavior.

Unit V: Scholarly Research

Goal: The student will demonstrate the ability to create new knowledge.

Objectives - The student will be able to:

- a. Propose an original research question.
- b. Refine research proposal in collaboration with a mentor.
- c. Select an appropriate methodology.
- d. Finalize the research proposal for original research.
- e. Conduct research.
- f. Collect, analyze, and interpret data.
- g. Recommend solutions and articulate results.
- h. Write an abstract and scholarly research paper.

Unit VI: Research Presentation

Goal: The student will demonstrate the ability to effectively communicate research findings.

Objectives - The student will be able to:

- a. Communicate technical information in oral and written form.
- b. Create multimedia presentations.
- c. Demonstrate the ability to lead as well as work with a team.
- d. Relate research findings effectively to a variety of audiences.