

Capstone Project Guidelines Addendum for ALL Engineering Majors

In addition to satisfying the goals of the individual majors, the senior design project completes the University Core Requirements in: Civic Engagement (for those who also took ENGR 1); Science, Technology, and Society (for those who took ENGL 181, 182A & 182B); and Arts (for those who took ENGL 181, 182A & 182B).

Civic Engagement Objectives:

1. Students will be able to critically evaluate, and express reasoned opinions about, the role of public organizations (governmental, non-governmental, multilateral, or international) in civic life through both oral and written work;
2. Students will analyze and evaluate civic issues by engaging in active and collaborative learning with peers and others through one or more of the following: a) Working cooperatively with other students in class; b) Actual observation and participation in the contemporary ramifications of various types of civic life or civic discourse; or c) Working with civic organizations beyond the walls of the University;

STS Objectives:

1. Recognize and articulate the complexity of the relationship between science and/or technology and society
2. Comprehend the relevant science and/or technology and explain how science and/or technology advance through the process of inquiry and experiment
3. Analyze and evaluate the social impact of science and/or technology and how science and/or technology are themselves impacted by the needs and demands of society.

Arts Objectives:

1. Create and interpret art, individually and collaboratively.
2. Through artistic creation students will express knowledge and understanding of the world, humanity, and themselves.
3. Analyze and critique art to inform and inspire their own creative practice.

Civic Engagement:

Students address both of these objectives in ENGR 1, but must address the first objective again from a more mature perspective through the oral and written presentation of their senior design project.

The “Professional Issues and Constraints” document describes guidelines for the senior design project in all engineering departments except Civil Engineering. It describes the issues that must be addressed in that section of the senior thesis.

The Civil Engineering department uses a different set of guidelines for the design project. Each senior majoring in Civil Engineering must also address objective 1, most particularly through the “Related Non-technical Issues” and the “Identification of Applicable Design Criteria and Standards” elements required in their senior design project proposal for CENG 192A.

STS:

The 3 STS Learning Objectives will be offered in 3 different ways, but assessed together in the senior design thesis. Learning objective 1.1 (students will be able to recognize and articulate the complexity of the relationship between science and/or technology and society) will be met through lectures and presentations in various courses in the engineering curriculum, and assessed in the senior design thesis. Learning objective 1.2 (students will comprehend the relevant science and/or technology and explain how science and/or technology advance through the process of inquiry and experiment) will be achieved through the scientific method presented and applied in multiple Engineering classes, and assessed by analyzing senior design project theses. Learning objective 1.3 (students will analyze and evaluate the social impact of science and/or technology and how science and/or technology are themselves impacted by the needs and demands of society) will be achieved throughout the engineering curriculum, and assessed by analyzing the work in ENGL 181 as well as senior design project theses.

Arts:

The process of engineering design contains a distinct aesthetic component. Although the functionality of the final product is undoubtedly the primary objective of any technical design, the simplicity and elegance with which this is achieved *does* matter.

With that in mind, the first objective of the Arts requirement will be met through the creative design process required for the senior design project, and will be evidenced by documentation explaining the rationale for choices made in the Senior Design Project.

In addition, every member of a senior design project team will create drawings/layout /graphical representations appropriate to their project, even if only one such set of drawings is included in the final report.

The advanced writing course will include assignments addressing the second and third objectives of the Arts requirement.

Please see the attached syllabus for ENGL 181 & 182 for the specifics of assignments addressing the second and third objectives.

Note: The requirement for collaborative work is satisfied by all engineering graduates, since teamwork is an essential part of engineering, and is required by our professional accreditation, which requires that we demonstrate that our students attain the following Student Outcome:

- (d) an ability to function on multidisciplinary teams