

VSU Department of Engineering & Technology Capstone Senior Design Project Guidelines

The **Capstone Senior Design Project** is a major experience in product realization – creating or improving a product, process, or system. VSU Department of Engineering & Technology faculty must approve all projects. This document discusses the factors that are considered in approving Senior Design projects.

Factors Considered in Approving Senior Design Projects

- Engineering design content – the project must be nontrivial and open-ended, requiring the student team to define objectives, scope of work, criteria for success, and a strategy for managing the project. The project should require both *analysis* and *synthesis*.
Analysis – application of the engineering, sciences, and mathematics to analyze elements of the design and support design decisions.
Synthesis – an integration of goals, constraints (physical, ethical, etc.) and methods that enhance the creative outcome resulting in a new or improved product, process, or system.
- Multi/Interdisciplinary elements – the project should also require investigation beyond the subject matter of student team members' disciplines (to encourage independent investigation and equip students for lifelong learning). Students are encouraged to seek expert advice in these areas.
- Team work – teams should have 2 - 4 members (to promote team work skills and ensure full participation). Large teams are hard to coordinate and it is rare for the workload to be distributed equitably, and individual projects fail to prepare the student for team work in industry. Exceptions (submit *Project Exceptions Form*) may be allowed for individual projects supported by an industrial sponsor if the company submits a letter committing support to the project, including personnel to work with the student.
- Advisor – each project requires a faculty member willing to fulfill the expectations described in *Advisor Guidelines* to help ensure the success of the project through adequate support and regular assessment.
- Funding & Facilities – are adequate financial resources and facilities available for the project to be successful?
- Work-product – specific work-product expectations are program dependent and are determined by the Chair and Senior Design Coordinator of the program. The design product might be a part, a software application, a process, an integrated circuit, a control system, a device, or a mechanism, but there must be a significant design component. Projects that culminate in a white-paper treatise or research paper do not meet the course requirements. Scale model prototypes may be permitted due to cost constraints. If the product is developed off campus, perhaps for a company, and it is not feasible to bring the product to campus, photographs and/or a videotape of the product may be presented. Exceptions (submit *Project Exceptions Form*) may be granted when the scope of the project is particularly difficult or comprehensive. For example, an exception may be granted when the design requires extensive computer modeling, analysis and optimization. In this case, the outcome may be a solid model, detailed simulation results showing effects of design parameter changes, design decisions, and production drawings, or a detailed process design.
- Effort & Schedule – projects should represent at least six hours of work per student each week, and be do-able in 9 months. Larger teams are expected to undertake more comprehensive projects.

Required Forms & Approvals

A ***Project Approval Form*** must be submitted for all projects within the first few weeks of class, typically in the fall semester of the senior year. See the *Senior Design Process* document for the precise due date (available in class). This form must be signed by a faculty member in the Department of Engineering & Technology who has agreed to serve as the Project Advisor, and must be accompanied by a “*Preliminary Project Proposal*” (see *Reporting Guidelines & Required Elements*).

The Senior Design Coordinator represented among the student team members will review the *Preliminary Project Proposal* based on the above criteria and either approve the project, reject it completely, or request changes/clarifications from the team or advisor before approving the project. If a project is rejected, students will be given a reasonable amount of time to find an alternative project.

The Project Advisor or the Senior Design Coordinator for the CPEG program represented among the student team members may also require the ***Project Exceptions Form***, typically when the:

- Team does not have 2 - 4 members (i.e., one member or more than four)
- Work-product is not typical (for the program/discipline of one or more of the team members)
- Team has a student(s) who has not achieved Senior standing
- Other – the advisor or a program coordinator may identify an issue requiring further explanation