

Virginia Tech
ECE 4805- 4806 Two-Semester
Major Design Experience

Sponsor Handbook

Rev 8
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This document is to be used as a guide for both Prospective and Returning MDE Sponsors whether they are companies external to Virginia Tech (VT) or ECE Faculty members.

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Introduction to ECE 4805-4806

ECE 4805-4806 is a two semester major design experience that is intended to provide students with an “industry-like” experience emphasizing technical, management and professional development. Students working in teams will complete a sizeable hardware, or hardware related software project sponsored by industry or a faculty member. Important “real life” skills such as teamwork, project management, communications, ethics and engineering professionalism will be developed. This course consists of two semesters of lectures and project time, and will culminate with an industry/faculty poster session.

Critical to the success of this program are the customer-sponsored projects. The work scope of each client-sponsored project will be carefully formulated to satisfy the learning objectives. Students successfully completing this course will be able to:

- Identify and explain the business contract process for engineering project acquisition
- Design a solution to a sizeable hardware, or hardware based software problem
- Implement the design solution and verify the performance against the design constraints
- Develop schedules, budgets, project control methods and documents
- Organize and write design documents and project reports
- Organize and make technical presentations that describe a design
- Develop professional skills

Sponsor Eligibility

The following are eligible to sponsor an ECE Major Design Experience (MDE) project:

- Full-time, direct employees of companies external to VT
- VT ECE Faculty
- VT Professors with courtesy appointments to ECE
- VT Professors outside ECE, with approval from the ECE Department Head

The following are not eligible to sponsor an ECE MDE project:

- Parents or relatives of students
- Retired, part-time, student, intern, or consulting staff of a company external to VT

About the Students

VT's ECE program strives to prepare its future graduates using best-in-class practices and curricula. Team sizes are typically set at 3-5 to ensure sufficient manpower to complete the Sponsor's project while assuring the team will possess a balance of skill sets. Team sizes other than 3-5 are not permitted, unless there are special requirements that are approved in advance. Sponsors may not subdivide a design team once formed.

Roles and Responsibilities

Each MDE project team will consist of a student design team, customer representative, subject matter expert, and program manager/instructor. These roles and responsibilities will be formally documented and reviewed at the project initiation.

Design Team (DT)

There will be 3-5 student members per team that are responsible for the design and completion of a project. Team leadership will be rotated. The role of the leader is to interface with the customer, subject matter expert and program manager/instructor. All team members must display professionalism, personal commitment, responsibility for decisions, and regularly communicate to peers and support staff. Periodic self-evaluations will be conducted.

Customer (Big C)

The customer will be a formally identified company or faculty member that sponsors the project. The customer will provide the design problem and support throughout the two semesters, and project sponsorship. The customer will provide any unique and necessary non-confidential hardware/software needed for the project. It is expected that the customer will provide a minimum of four hours per month to perform such tasks as project design reviews, RFQ generation, and monthly status reporting. In addition, the customer should attend the culminating industry day poster paper sessions. Customer satisfaction will be a factor in the design team's final grade.

Subject Matter Expert (SME)

The SME is a discipline expert that will provide technical information to the student team. The SME has a defined role to consult, advise, and monitor. The SME most likely will be a faculty member, although industry sponsors could also provide SMEs. The responsibilities of the SMEs are to provide ongoing technical input and periodic evaluations of design team performance and deliverables. The SMEs are required to display a strong commitment to their program. The SME cannot be retired, part-time, a student, an intern, or consulting member of a company external to VT. The SME may be a PhD Candidate graduate student if the Sponsor is a VT ECE Faculty member.

Program Manager/Instructor (PMI)

This individual is responsible for overall program success. Specific duties are outlined below:

- Secure project sponsorship
- Communicate course objectives
- Working with the SMEs, match students to projects; students will provide their preference
- Conduct classroom lectures in the areas of business acquisition process, team building, professionalism, ethics, project management, and personal skill development
- Monitor design team progress and customer relations, foster open communication
- Act as a student mentor and coach
- Evaluates student performance and assign grades
- Ensure equity among student projects and customer interfaces

Defining a Major Design Experience Project

Prospective Sponsors are requested to complete the nomination form in Appendix A. Guidelines for defining a project are as follows:

- Project is of interest to the Sponsor and is something the Sponsor would care to pursue
- The Sponsor may not have sufficient time or manpower to pursue
- Is NOT in the critical path of any work flow
- Lends itself to a team of 3-5 Electrical Engineering and/or Computer Engineering students

Proposals should be submitted:

- Electronically to the course faculty before the first day of class.

Matching Students to Projects

The sponsorship nomination form will be reviewed by the PMI and SME to ensure the course learning objectives will be met. A consolidated list of Projects will be available to students prior to signing up for their Fall semester classes. Students will indicate a project preference. The PMI and appropriate Faculty members will assign project teams. Students will be notified of the project assignment by the completion of the Spring Semester. The PMI reserves the right for the final determination of team membership and size

Nominal Milestone Schedule

The Nominal Milestones for program success are outlined below:

Pre-Semester

Customer provides sponsorship nomination (Appendix A)

SME, PMI and Customer refine project/accept project

Students sign up for class

PMI assign students to project and notifies students

Customer provides Project RFQ

Fall/Spring Semester (30 weeks total)

Week 1 – Students receive Customer RFQ

Week 4 – Student teams provide proposal

Week 5 – Project scope, budget, schedule finalized

Week TBD – Preliminary design review

Week TBD – Final design review

Week TBD – Prototype complete

Week TBD – Final deliverable

Week 29 – Industry Poster Session

Sponsor Expectations of Students

Most students are taking 4 or 5 other engineering classes with associated homework sets, projects, and exams. Applying standard guidelines, students are expected to contribute approximately 9 hours/week for a 3-credit class each semester. Sponsors should expect a "best-effort" on behalf of the students. Sponsors should not expect work output typical of direct employees and especially those with an engineering degree and/or industry experience. The Sponsors, acting as the Customer, will regularly receive status updates and participate in all critical design reviews.

Project Outcomes

It is not possible for VT ECE to guarantee the results of a particular team or project. As with all teams there may be factors beyond the control of the University, or the Sponsor, leading to unanticipated project outcomes. Projects that are well defined from the beginning have a higher chance of succeeding.

Suggested Funding Levels

An amount of \$7,500 is requested per project team. This amount is to help defray the costs associated with MDE such as, but not limited to: computing, instrumentation, components, fabrication, documentation, printing, and so forth. Payments are due Net 60 Days after a project team has been finalized.

Projects at a Student's Place of Employment

Projects at a student's place of employment are typically not permitted. However, such projects may be considered if the Sponsor (not the student) originates and defines the project, and agrees in writing to:

- Define a project sufficient in scope for 3-5 students by the prescribed deadline
- Sponsor and technically guide a team of 3-5 via an appointed Subject Matter Expert
- Meet the suggested funding level

Such consideration does not guarantee the approval of such a project nor does it guarantee the forming of a project team.

Intellectual Property

Students may not sign any Intellectual Property agreements. Students may not sign any Non-Disclosure agreements. These are University policies and there are no exceptions. No project work may include elements that are deemed For Official Use Only, Proprietary, Sensitive, or Classified. Posters will be publicly displayed and Project Notebooks will be publicly available.

The Sponsor has the right to specify that their project team be comprised of US citizens.

Should a company require approval of the Poster or other materials before public display, it is the responsibility of the Sponsor to ensure that such approval is secured in a proper and timely fashion and

according to the requirements of the Sponsor's firm. In any event, VT shall be held harmless for the public display of project materials.

Grading

Sponsors and SMEs will be asked to assess student performance and the results will be taken into account when determining grades. The instructor PMI is responsible for determining semester grades.

Notifications

VT and the Sponsor shall notify each other in writing (email is acceptable) within 10 days of any of the following occurrences:

- Change of Subject Matter Expert
- Change of student team (e.g., drop or prolonged illness)
- Change in availability of facilities
- Redefinition or re-scope of the project

**Appendix A (ECE 4805-4806)
Customer Project Nomination Form**

Company Name: _____

Customer POC: _____

Name Title Location

Phone

E-mail

Billing Info / Contact: _____

(Note: Normally due 60 days from start of the first semester of the class)

A. High Level Project Description:

B. Statement of why the project is of interest to the Sponsor:

C. Major deliverables expected: _____

D. What should the team expect with respect to customer support (eg 4 hours/month)

E. Does this project require unique hardware or software that will be provided by your company? If materials are not furnished, can this project be accomplished within \$7500 for materials/parts?

F. Does this Project require US Citizenship, and/or unique specific technical skills?

G. Will the project be able to be performed within design labs at VT, Blacksburg, VA?
