

ECET 490 - Senior Design Project, Phase I (Credit 1)

Fall 2009

Updated version

This course covers the following ABET criteria: a, b, c, d, e, f, g, h, k.

CLASS MEETINGS: On Web <http://ecet.calumet.purdue.edu/~jpgrawa/ecet490>

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OFFICE HOURS: See on the class Web

PREREQUISITE: ECET 397 and Senior standing.

COURSE DESCRIPTION FROM 2001-2003 CATALOG

An extensive individual design and/or analytical project performed in consultation with one or more faculty advisors. Collaboration with representatives of industry, government agencies, or community institutions is encouraged. Evidence of extensive and thorough laboratory performance is required.

Phase I includes, but is not limited to, faculty acceptance of the project proposal, defining and limiting project objectives, initial research and source contacts, procurement of materials, and periodic progress reports.

COURSE OBJECTIVES

ECET 490 prepares the student for Phase II of the Senior Design which includes further research, project implementation and display of the finalized design, oral presentation to faculty and other interested parties, and a formal written technical report. The final report must be of a quality that warrants its place in the Purdue University Library system.

The main objectives of ECET 490 are as follows:

1. Apply principles, theory, problem solving techniques, and general knowledge acquired through the accumulated courses in order to design a project of moderate difficulty and start its implementation and some preliminary testing.
2. Demonstrate sufficient written communications skills.
3. Demonstrate sufficient oral communication skills.

ASSESSMENT MECHANISM

The following mechanisms will be used to assess the above objectives:

1. Weekly progress reports are used to assess the incremental work of each student.
2. A technical written report is used to assess the student writing skills.

3. Oral presentations of the proposal are used to assess the student oral communication skills.

COURSE HIGHLIGHTS

1. Selection of the Project Topic and Project Advisor:

Source: Student, Faculty, industry, other individuals, etc. (See “Deadlines”)
Continuation of your ECET 397 project topic is not acceptable.

2. Acceptance of the Project:

The ECET Faculty Advisor and the course coordinator reserve the rights to modify or reject the topic or the project proposal.

3. Feasibility Study:

- * Define and limit the project objectives so that a solution to the problem is possible and the implementation reasonable within a two-semester time frame.
- * The scope of the project is such that all needed material is readily available.

4. Literature Search:

Results must be included in weekly progress reports and summarized in the final report.

5. Planning of the Design:

- * Project breakdown into smaller and simpler tasks.
- * Time table.

6. Final Written Report:

See details in the section “FINAL WRITTEN REPORT.”

7. Progress Reports:

Biweekly progress reports assess the student’s ability to perform individual research and to ensure that the objective of the project can be reached in a timely fashion.

8. Logbook:

- Every student must maintain an individual LOGBOOK (in bound form) from the beginning of the semester in ECET 490 to the completion of ECET 491. The logbook must clearly reflect your THINKING and PLANNING during all phases of the design and implementation.
- The LOGBOOK must be produced whenever requested by the advisor. This is particularly important in a group project, where **each student must keep an individual logbook to show his/her own work.**
- It is suggested that your LOGBOOK contain at least, but not limited to, the following:
 - 1) Date-wise entries
 - 2) Hand-drawn schematics and sketches
 - 3) Record of experimental data, procedures, short programs, etc.
 - 4) New ideas
 - 5) Problems encountered, anticipated, solved, existing, etc.

9. Oral Presentations:

Two (2) short oral presentations of the proposal (5 to 10 minutes) must be given to the ECET 490 class. **A final oral presentation must be given to the ECET faculty and to other interested parties (usually at the Center or Alumni Hall),** scheduled along with the ECET 491 presentations.

DEADLINES (updated)

Monday September 28, 2009:

Project topic/title signed by the advisor due to be posted on your personal page in the Student Electronic Portfolio.

Note: No compliance with the above deadline will result in negative 5 points per day late, hence affecting the final grade in the course.

Monday October 26, 2009: 5 min in-class PowerPoint presentations of what was done up to this date.

Monday November 30, 2009: Final written report due in class; 5 min in-class oral presentations, and review of material for final oral presentation. **After evaluating each project presentation, Instructor will provide approval to individual teams to present in the final presentation on Dec. 4.**

Note: No submission of the final report by that date will also result in the student not being listed for the final oral presentation.

Friday December 4, 2009: 15-min PowerPoint presentation of the project proposal. **This presentation is open to other parties.**

PROGRESS REPORT DEADLINES: Due by 6 p.m. on the Monday of the due week.

PROGRESS REPORTS

- A total of **5 progress reports** (hence a report every 2 weeks) are required for the entire semester starting from the date of topic submission. **Each report is worth 20 points. Missing reports will lower the class grade.**
- As soon as the project is defined, an **individual** progress report is required from **each student** (even if the project is done in groups) and **must be submitted to the ECET course Coordinator**. The progress report **must be signed by the ECET Advisor** before submission.
- In the case of a group project, **each student must clearly emphasize his/her part within the project.**
- In the progress report, you should summarize any new work done, which could include literature search, problems solved, ordered parts, etc. Also try to summarize the status of the project in terms of the problems that remain to be solved.
- **It is the student responsibility to be in constant contact with the advisor and mutually agree on meeting times.**

FINAL WRITTEN REPORT

- A detailed, project proposal **written report** must be submitted to the course coordinator in class **on Monday, November 30th** (see “Deadlines” above).
- One of the objectives of this report is to prepare you for the second phase of your senior design (ECET 491), which requires a much more involved report. However, the formatting remains identical and therefore the following will apply to 491 as well.
- **The ECET 490 Final Written Report must include the following, in the given order:**
 - 1) The Departmental Hard Cover, with a glued (not taped) **2.25”x3.5”** title label. This label must be typed and must show the following information in the order shown below:

(SEE THE FOLLOWING FOR A SAMPLE OF A LABEL)

PROJECT TITLE
by
Student 1 Name (and) (Student 2 Name)
ECET 490 SENIOR DESIGN PROJECT, PHASE I
Fall Semester 2009

- 2) The title page, following the orange hard cover page (see attached title page sample).
 - 3) Acknowledgment page, if any. This acknowledgment page is optional.
 - 4) Table of contents, which must include all page numbers, starting with the introduction.
 - 5) Abstract, in a single page. (The abstract is a one or two paragraph summary.)
 - 6) Introduction, which introduces the reader to the topic. This may include the historical background behind the project, its justification, its usefulness, the feasibility study, etc.
 - 7) **A general description of the project** and related principles, backed by **block diagrams** and/or **flow charts**, specifications, features, early calculations, etc.
 - 8) Preliminary experimental results, if any, in tabular or graphical format, graphs, etc.
 - 9) Discussion of the results, discrepancies, and limitations (if available at this time).
 - 10) A **Conclusion**.
 - 11) List of references.
 - 12) The **project time schedule** in a Gantt chart form.
 - 13) Appendices, even if not complete, which might include specifications, data sheets, programs listings, early estimated cost analysis, etc.
- The report **must be typed, double-spaced, 12 font** on 8.5" x 11" white paper. Heavy white paper is not acceptable.
 - All main headings (e.g., INTRODUCTION, SYSTEM DESCRIPTION, etc.) must be in **UPPER CASE** letters, in **BOLD**, and preceded by roman numbers (**I, II, III, IV, etc.**), and **centered**.
 - All **main headings should start in a new page**.
 - Section headings must be in **lower case** letters, in **bold**, and preceded by Arabic numbers (**1, 2, 3, etc.**), left-justified, and **underlined**.
 - Subsection titles must use lower case letters (a, b, c, etc.), **underlined** and **indented**.
 - All pages must be numbered, starting with the introduction page.
 - **Absolutely no hand-written pages and no hand-drawn schematics.**

FINAL ORAL PRESENTATION OF THE PROJECT

- In addition to the 2 mid-semester in-class oral presentations, every student, individual or within a team, is **required to make a 10 to 15 minute oral presentation. Since this last presentation is scheduled along with the 491 presentations and therefore is open to other parties, professionalism and dress code is expected from each of you. You will be reminded by mail for both the time and place (usually the Center or Alumni Hall).**
- Students must come ready with enough, but precise transparencies (**Power Point** slides recommended) to cover every aspect of the topic to be presented.
- Start with a general block diagram of the project before going into more details.
- Avoid spending too much time on the Gantt chart and on cost analysis.

Important Note:

Failure to make the final oral presentation will result in an incomplete grade in the course. Only extreme cases can be accommodated and must be discussed with the course coordinator. Any emergency situation (e.g., health) should be documented.

GRADING

Weekly visit to Website	10%
Project Selection in time	5%
Power point I	5%
Power point II	5%
Log book	5%
Weekly reports	10%
Final Written Report	10%
Advisor's grade	50%
Total	100%

Final letter grade will be decided by curve and by the course coordinator, to be explained in the first class meeting.

OTHER IMPORTANT INFORMATION

1. A project can be done individually or in teams of **no more than TWO students each. A team of more than two (2) students is not acceptable.** In case of a group project, each student in the group must demonstrate his/her role in the project. This must be clearly defined throughout ECET 490 and ECET 491. The student should also be knowledgeable in the other parts of the project.
2. A project cannot be an implementation of a schematic taken as a whole from an electronics magazine. However, a schematic can be used as part of a project.
3. A project cannot be a replacement of the student's work place.
4. Each project must have an **ECET faculty member as the main advisor.** A project may also have a co-advisor, who may be either a faculty member in any department at PUC or a supervisor from the industry or from the work place.
5. The ECET Project Advisor will guide each project throughout both ECET 490 and ECET 491.
6. Once the advisor approves the project, the change of project topic is not encouraged. If that happens, the student will have to register again for ECET 490 and spend the same amount of time (an entire semester in ECET490).
7. Failure to meet the due dates and non-compliance with the general format of the course will result in a failing grade.
8. It is the responsibility of the students to continuously check the class website for bulletins and announcements.
9. Again, it is the student responsibility to **meet periodically** with the advisor throughout the entire semester.

10. A student who **fails to contact the advisor** for **more than two (2) weeks** may be subject to the **administrative drop from the course**, according to the University guidelines.
11. There **won't be any incomplete grade** given in the course, except for health or other extreme circumstances. Job related reasons or overload are not acceptable.
12. One or more outstanding projects will be selected when completing the second phase of the senior design. So strive for excellence and make this a worthwhile experience that can be used as significant highlight in your resume.

ATTENDING THE ECET 491 SHOWCASE AND PRESENTATIONS

It is strongly recommended for all ECET 490 students to attend the ECET 491 Showcase in the concourse of the Student and Faculty Library Center at the end of the semester (Friday, **December 4, 2009**). In addition, ECET 490 students are required to attend the ECET 491 oral presentations since they are scheduled the same day (**Friday Dec. 4, 2009**).

ACADEMIC INTEGRITY STATEMENT

Ethics are an integral part of being a student and a professional. Academic integrity is the hallmark of this university. Therefore, Purdue University Calumet does not tolerate academic dishonesty in any form. If a student breaches integrity, the student risks sanctions in both the academic and conduct arenas. Academic dishonesty includes, but is not limited to, the unauthorized use of other's intellectual property (plagiarism) and lying to an instructor or other university employee. Such actions will result in a failing grade in the assignment with the strong possibility of course failure, and the strong possibility of referral to the Office of the Dean of Students for a conduct sanction. (See Purdue University's student handbook.)

ABET (Accreditation Board for Engineering and Technology) a-k Criteria:

An engineering technology program must demonstrate that graduates have:

- a. an appropriate mastery of the knowledge, techniques, skills and modern tools of their disciplines,*
- b. an ability to apply current knowledge and adapt to emerging applications of mathematics, science, engineering and technology,*
- c. an ability to conduct, analyze and interpret experiments and apply experimental results to improve processes,*
- d. an ability to apply creativity in the design of systems, components or processes appropriate to program objectives,*
- e. an ability to function effectively on teams,*
- f. an ability to identify, analyze and solve technical problems,*
- g. an ability to communicate effectively,*
- h. a recognition of the need for, and an ability to engage in lifelong learning,*
- i. an ability to understand professional, ethical and social responsibilities,*
- j. a respect for diversity and a knowledge of contemporary professional, societal and global issues,*
- k. a commitment to quality, timeliness, and continuous improvement.*