

ECE 405 Design III

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CLASS MEETING TIME

We will not meet on a regular basis. However, you are expected to meet with your advisor weekly or on some agreed upon schedule. Additionally, you are required to meet with your client, if you have one, routinely and sufficiently to keep them abreast of your work in order to design and build your project according to their desired specification.

You will be notified **by email** about meetings, deliverables, presentations, etc. If you don't receive my emails, add my yahoo address to your list. Also, communicate the information with each other. Missing an assignment, presentation, etc. due to "Not knowing about it." or some similar excuse is not acceptable and you will receive a grade of zero.

TEXTBOOK

No textbook required

PREREQUISITES

ECE 403 – Design II

COURSE DESCRIPTION

Capstone experience in formulation, design, and production of a system or device.

OBJECTIVES

The goal of ECE 405 is to finalize the design of the capstone project and produce a fully functional, packaged, and completed system or device. This third of three courses in the design sequence provides an opportunity to learn advanced skills and apply theoretical knowledge to build a device to solve a problem. Additionally, you will gain experience in writing technical documents, giving presentations, and maintaining design notebooks.

Particular course objectives are as follows:

1. Effectively communicate with a client to determine needs
2. Apply design methods to make informed, professional and ethical decisions
3. Apply modern tools, equipment and skills on a project
4. Develop, design and deliver a completed, operable system on time
5. Design and develop a system that meets desired functions, specifications and budget
6. Recognize the impact of a project
7. Function on a (multidisciplinary) team
8. Effectively manage a budget, time and group dynamics
9. Effectively communicate design, operation and status information
10. Maintain an engineering journal of design work

Relationship of course objectives to ABET Criterion 3 student outcomes

	ABET Criterion 3 Student Outcomes	Course Objective(s)
(a)	Apply knowledge of mathematics, science, and engineering	2,4
(b)	Design and conduct experiments, as well as analyze and interpret data	4,5
(c)	Design a system, component, or process to meet desired needs	1,2,4,5
(d)	Function on multidisciplinary teams	7
(e)	Identify, formulate, and solve engineering problems	2,4,5
(f)	Understanding of professional and ethical responsibility	2
(g)	Communicate effectively	9,10
(h)	Broad education necessary to understand the impact of engineering solutions	6
(i)	Recognition of the need for, and an ability to engage in life-long learning	2
(j)	Knowledge of contemporary issues	-
(k)	Use techniques, skills, and modern engineering tools necessary for eng. practice	3
(l)	Grow in the knowledge of and make professional contributions to at least one specific area of ECE	4,5

ABET Criteria <http://www.abet.org/Linked%20Documents-UPDATE/Program%20Docs/abet-eac-criteria-2011-2012.pdf>

STUDENT EXPECTATIONS

- Spend the necessary time required to satisfactorily design, prototype, build, troubleshoot, test, document, and present your project. This should be done in the spirit of *teamwork*.
- **Check your email regularly for notices, updates, schedules, etc. Missing events or turning in material late will result in a grade of zero.**
- **Purchases must be made through Jeff Erickson! You will not be reimbursed for unapproved purchases out of your pocket. Varsity Mart purchases will be your own expense.**

QUIZZES, & EXAMS

None will be given.

GRADES

Grading will be determined on both a group and individual basis. Please see the table below for the project group grading method. The individual component will include your notebook, a document describing your contributions and engineering accomplishments, and evaluations from your team members, advisor and client. **ALL PROJECTS MUST BE COMPLETED IN ORDER TO RECEIVE A LETTER GRADE. UNTIL COMPLETION, YOU WILL RECEIVE A COURSE GRADE OF 'INCOMPLETE' OR 'I' (the 'I' will automatically convert to an 'F' a few weeks later.** For projects with hardware, the system must be on a PCB, enclosed and working.

* All NSF groups must turn in an approved journal-quality document to Dr. Green prior to receiving a course grade. Until such time, a course grade of 'I' will be given. Expect approximately three to four revisions. You will receive a grade of incomplete or 'I' until I receive his approval.

Maximum Grade	Project Status
A	Completed, fully functional, meets specs and nicely enclosed.
B	Completed, mostly functional, meets most specs and nicely enclosed.
C	Completed, works but quite buggy and fair enclosure.
D	Somewhat working, doesn't meet specs. Poor/no enclosure.
I / F	Product is not working and not finished.

** NOTE **
Maximum grades can be adjusted downward by:
a) Poor attendance/performance/attitude
b) Not meeting deadlines
c) Instructor and advisor discretion
Individual group members can receive different grades.

Group/Project Grading is based on the table above.

Individual Grading is based on the following components:

- 1) A signed notebook demonstrating ABET criteria (a) through (k) below. *Attach a sheet to the back inside cover listing (a)-(k) and the pages where each are demonstrated.*
- 2) A document describing individual contributions and engineering methods. *This document must be signed by all other group members.*
- 3) Evaluations from your peers, advisor and client.
- 4) Level of participation on your project, documents and presentation.

Moderate deficiencies in the individual components can reduce your grade one to two letter grades. Significant deficiencies can reduce your grade three to four letter grades.

Approximate Timeline

Week(s)	Topic
1-3	Finalize design, procure parts, and build prototype (HW1)
4-6	Test and evaluate, troubleshoot, refine, repeat Technical Progress Report and meeting (Wk. 5 or 6)
6-8	PCB, test, and troubleshoot
8-11	Refine, package, test and evaluation
14	Final Product Demo Day!! All projects will be demonstrated this week. Projects should be enclosed, working and completed!!
14-15	Work on documents, turn in NSF Paper
16	Turn in all documents, notebooks, peer review, wiki Final PowerPoint Presentation

NOTICES

Any students with disabilities who may need special accommodations are encouraged to speak with the instructor as soon as possible to make appropriate arrangements.

CEA Honor System: All work in this course must be completed in a manner consistent with NDSU University Senate Policy, Section 335: Code of Academic Responsibility and Conduct and the CEA Honor System available at <http://www.ndsu.nodak.edu/policy/335.htm> and <http://www.ndsu.nodak.edu/ndsu/cea/>, respectively.