ECE 401 - Senior Design I

Spring 2025 - www.BisonAcademy.com

Course Information:

Instructor:	Jeff Erickson, Jake Glower
Class Times	Wednesday 3pm Offerdahl West (ECE) 125 & Zoom
Office Hours	(Erickson): Mo/Tu/We/Th 9-10am (Erickson), ECE 209
	(Glower): Tu/Th noon-4pm, ECE 201
Text:	none
On-Line Reference:	www.BisonAcademy.com

Bulletin Description:

Capstone experience in formulation and design of a system or device. 1 lecture. Prereq: EE 206

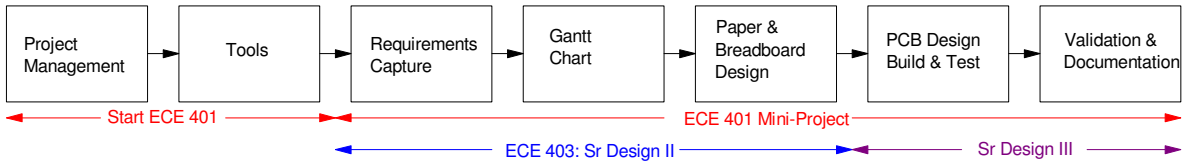
Senior Design 1, 2, & 3

Senior Design is a three-semester sequence at NDSU.

Senior Design I presents the tools for taking an idea from concept through a working prototype. A mini-project is used to allow students to apply these techniques and tools to a concrete example.

Senior Design 2 and 3 then take the tools and techniques presented in Senior Design I to take a larger, more complex project through the design process. The goal of this is to allow each student a chance to demonstrate

- That he/she can apply knowledge of ECE to an original working device, and
- That he/she is able to use tools related to ECE (such as oscilloscopes, function generators, etc.)



Tools and techniques used in Senior Design I will be used in Senior Design II and II

Expectation of Students for ECE 401:

- Use of schematic capture and printed circuit board (PCB) software
- Understanding the process for selecting components (understanding data sheets)
- Understanding PCB material considerations
- Understand the basics of soldering and rework techniques
- Understand the basics of project planning and management
- Understand the basics of safety engineering
- Use of lab notebooks for documentation

Hy-Flex Model for Spring 2025

This class is offered using the full Hy-Flex model. All students are welcome to attend class

- In-person (Wednesday, 3pm, ECE 125)
- via Zoom (live-stream, Wednesday, 3pm). and
- Online (YouTube videos)

It doesn't really mater what section you signed up for - there is plenty of space for students in each of these modes.

Evaluation Procedures and Grading Criteria

Grades will be the average of the following:

Homework	Final Exam
100%	none

Grades are rounded to the nearest 1%, with your final grade being

F	D	C	B	A
59% or less	60% - 69%	70% - 79%	80% -89%	90% or more

Syllabus

Week	**Lecture**	**Assignment Due Date (% of grade)** ***Late assignments: minus 10% for each week***
1	Syllabus & Project Description	
2	Project Management & OneNote	HW1: Project Selection (10%)
3	Breadboards & Raspberry Pi-Pico	HW2: Work Breakdown Structure (10%)
4	CircuitLab & Op-Amps	
5	Career Fair	HW3 Paper Design (10%)
6	Diodes & Transistors	
7	Fusion 360 Schematics	HW4: Simulation (10%)
8	Fusion 360 PCB Layout	
9	Soldering	HW5: Breadboard (10%)
10	Test Equipment	
11	*work on project*	HW8: Test Equipment (10%)
12	*work on project*	HW6: PCB Layout (10%)
13	*work on project*	HW7: Practice PCB (10%)
14	*work on project*	
15	*work on project*	
16	*work on project*	HW9: Final Report (20%)

Required Student Resources:

Lab Notebook (OneNote)

- Required for all groups.
- Each student should have a separate page in OneNote for posting their individual work
- Save all of your work (schematics, data sheets, simulation results, lab results, etc.) in your lab notebook.
- Your final report is your OneNote document

CircuitLab

- Free for all ECE students
- Free if you register using your NDSU email address

Poster:

11" x 17" printed poster summarizing your project

Legal Stuff:

Attendance: According to NDSU Policy 333 (www.ndsu.edu/fileadmin/policy/333.pdf), attendance in classes is expected. How you attend is up to you (in-person, live-stream, or via YouTube videos). Students are responsible for the material covered in class and in assignments regardless of their attendance. Note that all lecture notes, homework sets, and solutions are available on-line at www.BisonAcademy.com

Students with Special Needs: Any students with disabilities or other special needs, who need special accommodations in this course, are invited to share these concerns or requests with the instructor and contact the Disability Services Office (www.ndsu.edu/disabilityservices) as soon as possible.

Academic Honesty: The academic community is operated on the basis of honesty, integrity, and fair play. NDSU Policy 335: Code of Academic Responsibility and Conduct applies to cases in which cheating, plagiarism, or other academic misconduct have occurred in an instructional context. Students found guilty of academic misconduct are subject to penalties, up to and possibly including suspension and/or expulsion. Student academic misconduct records are maintained by the Office of Registration and Records. Informational resources about academic honesty for students and instructional staff members can be found at www.ndsu.edu/academichonesty.

Academic Honesty Defined: All written and oral presentations must respect the intellectual rights of others. Statements lifted verbatim from publications must be cited as quotations. Ideas, summaries or paraphrased material, and other information taken from the literature must be properly referenced (Guidelines for the Presentation of Disquisitions, NDSU Graduate School).

ECE Honor Code: On my honor I will not give nor receive unauthorized assistance in completing assignments and work submitted for review or assessment. Furthermore, I understand the requirements in the College of Engineering Honor System and accept the responsibility I have to complete all my work with complete integrity.

Veterans and Student Soldiers: Veterans and student soldiers with special circumstances or who are activated are encouraged to notify the instructor in advance.