Syllabus — ECE 395 — Microprocessor Laboratory

Section 101, Fall 2025

Instructor: **Amirarsalan Moatazedian**

Course Information

- **Course Number:** ECE 395 **Section:** 101 **Semester:** Fall 2025
- **Meeting Time:** Tuesdays, 6:00–10:05 p.m. (in person)
- **Location:** As listed in the official schedule. Note that instructor meetings are by appointment; in-person meetings will most likely be in Faculty Memorial Hall Room 101 (Center for Wireless Information Processing). Virtual meetings are also possible.
- **Instructor Contact and Office Hours:** Email or ask in person to schedule an appointment. Availability varies week to week. Meeting time and modality will be agreed upon by email or in person.
- **Course Materials:** No textbook. All files and materials will be posted in Canvas *Files* by the first day of classes (Tuesday, September 2, 2025).
- **Prerequisites:** ECE 252 (Grade D or better) AND (ECE 291 (Grade D or better) OR ECE 294 (Grade D or better)).
- **Electronics Project Starter Kit:** It is **strongly recommended** that students acquire a starter kit by the first session (Sept 2), and it is **mandatory** to have all items by the second session (Sept 9). The kit should include:
  - Breadboard
  - Jumper wires
  - Colored external LEDs
  - Push buttons and switches
  - Resistors
  - Arduino board

  These items can often be obtained from the IEEE lab on the first floor of Faculty Memorial Hall.
- You must pass a Syllabus Quiz with a score of 85% or higher (one attempt only). For this quiz, you do not need to memorize any numbers or numerical values. Only focus on the concepts of the Syllabus.
- All reports and summaries must be written in Overleaf using the provided LaTeX template. No prior experience with LaTeX is necessary; you only need to add your content to the template.

University Requirements and Policies (Fall 2025)

Syllabus Availability and Canvas

The syllabus will be electronically accessible in Canvas by the first day of classes. Canvas will be used for assignments, announcements, submissions, and the Verification of Presence process (details will be posted in Canvas).

Academic Integrity (NJIT Statement — required)

"Academic Integrity is the cornerstone of higher education and is central to the ideals of this course and the university. Cheating is strictly prohibited and devalues the degree that you are working on. As a member of the NJIT community, it is your responsibility to protect your educational investment by knowing and following the code of Academic Integrity policy that is found at: NJIT Academic Integrity Code. Please note that it is my professional obligation and responsibility to report any academic misconduct to the Office of the Dean of Students. Any student found in violation of the code by cheating, plagiarizing, or using any online software inappropriately will result in disciplinary action. This may include a failing grade of F, and/or suspension or dismissal from the university. If you have any questions about the code of Academic Integrity, please contact the Office of the Dean of Students at dos@njit.edu."

Course-specific integrity rules:

- Reports and project milestone summaries must be *original student writing*. Using AI to generate report text or summaries is prohibited. Rephrasing AI output to pass it as original is also prohibited.
- AI is allowed for programming help, equations, LaTeX preambles, Overleaf compile fixes, and images or slide generation (see "Writing & AI Policy").
- Group formation sabotage, or non-compliance with HiFive board return rules, has academic consequences described herein.

Generative AI Policy (required)

In this course:

- **AI permitted:** programming assistance, debugging, code suggestions, understanding concepts, generating equations, LaTeX preambles, resolving LaTeX errors, generating images/figures, generating slide skeletons or content.
- **AI prohibited:** *any* written text for reports and *any* written text for project milestone summaries. Rewriting or rephrasing AI output to appear original is prohibited.
- **Penalties:** First violation penalizes the specific report/summary and reduces bonus eligibility. Second violation disqualifies the student from bonus *and* yields a zero on the affected report. After a violation, past/future submissions will be scrutinized more closely.

Religious Observance (required)

Students must notify the instructor in writing of conflicts by the end of Week 2. Assignment due dates will not change. Quizzes and tests start and end at the same time for all students. For the three quizzes, all groups receive identical questions. The final project test is group-specific and based on each group's project code.

Assessment and Exams (required)

- At least two significant assessments will be graded and returned before the withdrawal deadline (November 10, 2025).
- No single assignment or exam exceeds 36% of the total course grade.
- All quizzes and tests are proctored in person and use LockDown Browser. A unique **PIN**, which changes for each exam, will be entered by the instructor. For group exams, members are expected to work in parallel on their own laptops and may move between them to collaborate.
- The final project test aligns with the official final exam period; for this Tuesday section the final session is Tuesday, **December 9, 2025**.

Wellness Day (required)

Thursday, October 2, 2025 is a Wellness Day. No classes, assignments, or quizzes/tests may be scheduled on that day.

Incomplete Grades (required)

"Incomplete" is granted only in rare, documented cases. Work must be completed by the end of the next regular semester, unless extended by the Dean of Students and pre-authorized by the Office of the Provost.

Attendance and Registration (required)

Only registered students may attend. Attendance and activity are tracked through the presence grade (see below).

Modality and Class Recording (required)

This course is fully in person. Any modality changes require Department Chair approval; polling students is not permitted. If any class recordings occur, they will comply with NJIT policy.

Announcements (Read Every Announcement)

Assignments are dynamic and evolve every semester. The instructor will post frequent and sometimes long announcements to clarify expectations. Students must read them carefully. Ignoring announcements harms performance and grades in two ways: missing important instructions and signaling lack of seriousness (reflected in the presence grade). Announcements can update assignment descriptions when necessary.

Presence Grade (Multiplier and Bonus Eligibility)

The presence grade is tracked by the instructor, is not part of the 1000-point scale, and is set at the end of the semester based on punctuality, activity, on-time submissions, and attention to announcements. It acts as a multiplier on your final scores as follows:

- For a presence grade of **80-89.99%**, your final scores for all **calculator assignments, quizzes, and reports** will be multiplied by your presence percentage.
- For a presence grade **below 80%**, your final scores for **all graded assignments** in the course (labs, project, and all calculator work) will be multiplied by your presence percentage.
- For a presence grade of 90% or above, no grade penalty is applied.

Bonus Linkage: A presence grade below 90% automatically disqualifies a student from receiving the bonus grade, even if all other conditions were met.

Group Policy (Strict)

- At publication time there are 32 students. This can change. Groups must be size 2 or 3 only. Groups of 1 or 4 are not allowed.
- Groups must be finalized within the first 15 minutes of Week 1. Groups may be rebalanced in Week 2 due to enrollment changes. After Week 2, groups are fixed.
- Examples: 30 students $\rightarrow$ ten groups of 3; 31 students $\rightarrow$ nine groups of 3 and two groups of 2. Two groups of 2 may *not* merge into a group of 4.
- If a student is left without a group, the instructor will rebalance the groups, randomly if necessary.
- Sabotaging group formation disqualifies the student(s) from bonus and carries further grade penalties.
- Groups of 2 are at a disadvantage; the instructor may grant compensating benefits. Groups of 3 must accept this.
- Chemistry issues are the students' responsibility to resolve; the instructor will not micromanage group dynamics. The reason for any dysfunction is irrelevant, and failure to resolve internal conflicts will negatively impact the entire group's performance.
- All members must contribute. While focus may differ (calculator vs. project), all members must be familiar with all work for quizzes and the final test.

Laboratory (50 points / 5%)

- The 5 standard labs plus *LabExtra* are completed by Week 4.
- Labs are completed in class on the same day. No late submissions.
- Starting Week 5 there are no more labs. Lab time is used to work on the calculator and project.

Calculator (510 points / 51%)

The calculator is the central component of this course, worth 510 points (51%). Your task is to enhance this advanced C program, written for the HiFive1 Rev B microprocessor. The main file (`main.c`) is $\sim$10,000 lines.

Historical Context

This codebase is the result of hundreds of hours of development across three prior semesters. Students in Fall 2025 begin with a highly sophisticated version, making the initial weeks challenging.

Rationale for Calculator Weighting

The calculator component (51%) is weighted more heavily than the project (44%) because its evaluation is more granular. There are three calculator quizzes and three reports (210 pts total), whereas the project has a single, albeit significant, final test (75 pts). The calculator's final milestone represents one step in a long sequence of enhancements to an already complex system, while the project's final milestone represents the culmination of building a system from scratch.

Structure and Deliverables

- 10 milestones, 3 reports, 3 quizzes. The specific topics and milestones covered by each report and quiz will be detailed in their respective Canvas assignment descriptions.
- **Reports (3)**: Overleaf LaTeX, calculator-based only. Each is worth 35 points.
- **Quizzes (3)**: Group quizzes using LockDown Browser, 6:00–10:30 p.m. Each is worth 35 points.

PROJECT (440 POINTS / 44%) — ARDUINO-BASED

- **Complexity Standard:** The project must be innovative and involve complex programming that **exceeds the complexity of labs 1 to 5 & lab extra**.
- **Proposal Requirement:** Each group must propose **two unique projects**. This provides a backup if the first choice is taken by another group or not approved.

Languages and Tools

Allowed: C, C++, Assembly on Arduino. IDEs: Arduino IDE or Visual Studio Code. Note that Python/MATLAB are disallowed.

Project Milestones and Submissions

- **Project 100% Milestone:** For this final milestone, your project must be fully operational. You are required to upload the following:
  1) A **zip file** containing all of your project's scripts, libraries, and folders.
  2) A **demonstration video** of your fully functional project (under 3 minutes). Ensure the video is recorded with the correct orientation for full-screen viewing on a computer screen. This video must also be added to your non-code presentation slides.

Final Deliverables and Evaluation (Week 14 — December 9)

- **Individual Code Recording (35 pts):** This is an individual assignment. Each group member must submit their own screen-recorded presentation explaining the project's code.
  - **Slides:** You must prepare slides for the presentation using Overleaf (LaTeX Beamer).
  - **Duration:** The screen recording must be a minimum of one hour long.
  - **Content:** The explanation must cover the purpose of each code snippet, how the code functions, and the overall logic and flow of the program.
  - **Grading:** You will be graded individually based on the depth and clarity of your explanation and the quality of your code snippets.
- **Group Non-code Presentation (15 pts):** This is a group assignment. Your group will create and submit a single screen-recorded presentation.
  - **Duration:** The presentation must be **15 minutes long**. For groups of three, each member speaks for 5 minutes. For groups of two, each member speaks for 7.5 minutes.
  - **Content:** The presentation must address the project's functionality and utility, challenges faced, components and implementation (excluding code), and relevance and applications.
- **Final Project Test (75 pts):** In-class 6:00–10:30 p.m. This is the ultimate assessment of your project knowledge. It is a group-based test with questions derived from each group's specific project code.

HIFIVE BOARD POLICY (STOCKROOM FMH 304A)

- On the first day (Sept 2), **every student** must temporarily sign out a **HiFive1 Rev B board** from the ECE stockroom. You must provide your NJIT Student ID.
- Starting Week 2, one or two members per group (number specified by instructor) must sign out a board for the group's use until before the reading day.
- Boards must be returned **before Reading Day**. Failure to do so disqualifies the student(s) from the bonus grade. A past student with the highest pre-bonus grade was disqualified for a late return, dropping their final grade from an A to a B+.

PHONES, FOOD, LAPTOPS, AND LOCKDOWN BROWSER

Phones

During quizzes/tests, all phones must be silenced and placed on a designated table. Medical exceptions require documentation, and the phone must remain in the instructor's sight.

Food and Drink

Water is allowed. Small snacks/fruit are permitted. No meals. No eating while the instructor is teaching.

Laptops and Chargers

Every student who owns a laptop must bring it and a charger to all sessions. If a laptop dies for lack of a charger, the grade stands. Students without laptops may use lab computers, but they must contact the instructor for further details.

WRITING, OVERLEAF, AND AI

Overleaf/LaTeX Required

All reports and slides must be prepared in Overleaf using LaTeX (Beamer for slides). Overleaf projects are shared with the instructor. Overleaf allows the instructor to fully track each student's writing/editing history. This history will be used to detect AI usage and determine each student's contribution level.

Reports and Project Summaries

Reports and quizzes are calculator-based. Arduino Project milestone submissions must include a short progress summary written by students without AI. It is prohibited to use AI for any written text for reports and any written text for project milestone summaries. Rewriting or rephrasing AI output to appear original is prohibited.

BONUS GRADE (NOT PART OF 1000 POINTS)

Receiving the bonus grade is conditional.

Stage 1: Qualification

You must pass a **Syllabus Quiz** with a score of 85% or higher (one attempt only). For this quiz, you do not need to memorize any numbers or numerical values. Only focus on the concepts of the Syllabus. Passing in Week 1 (by Sep 2) makes you eligible for up to **6.5%**. Passing in Week 2 (by Sep 9) makes you eligible for up to **5%**.

Stage 2: Conditions for Maintaining Eligibility

After passing the syllabus quiz, you must maintain your eligibility. Your bonus will be reduced or eliminated if you fail to meet the following conditions.

Automatic Disqualification (Bonus becomes 0%): You will lose all bonus eligibility if any of the following occur:

- Your **presence grade is below 90%**.
- You score **below 50%** on any of the three calculator reports or three calculator quizzes.
- You score between 50% and 66.66% on **three or more** of the six calculator reports and quizzes combined.
- You return the HiFive board late.
- You misuse AI for written work.
- You are involved in group formation sabotage.

Bonus Reduction: Your potential bonus will be reduced as follows:

- If you score between 50% and 66.66% on **one** of the calculator reports or quizzes, you will receive **at most two-thirds** of your potential bonus.
- If you score between 50% and 66.66% on **two** of the calculator reports or quizzes, you will receive **at most one-third** of your potential bonus.

Stage 3: Bonus Assignment and Calculation

If you remain qualified, you must complete the calculator-based **Bonus Assignment** (due Week 13) to earn the bonus points. The final bonus is calculated in two steps:

1) Your initial eligibility is scaled by your quiz score: $\textit{Eligibility \%} = (\frac{\textit{Quiz Score}}{100}) \times \textit{(6.5\% or 5\%)}$
2) Your final bonus is determined by your performance on the bonus assignment: $\textit{Final Bonus} = \textit{Eligibility \%} \times (\frac{\textit{Bonus Assignment Score}}{100})$

LETTER GRADE SCALE

- A: 93% – 100%
- B+: 85% – 92.99%
- B: 77% – 84.99%
- C+: 70% – 76.99%
- C: 60% – 69.99%
- D: 50% – 59.99%
- F: 0% – 49.99%

There is no curving. See the next page for grading & schedule.

Full Grading Breakdown (1000 points total)

Important Note on Due Times: Due times vary. Pay close attention to the specific time listed for each assignment in Canvas and in the calendar below.

Assignment	Points
Labs (50 pts = 5%)	
Lab 1 (Group)	10
Lab 2 (Group)	10
Lab 3 (Group)	15
Labs 4&5&Extra (Group)	15
Calculator (510 pts = 51%)	
Calculator 10% (Group)	10
Calculator 20% (Group or Individual [TBD])	10
Calculator 30% - 100% (Group or Individual [TBD])	280 (35 each)
Report 1 (Group) [Min 10,000 Words]	35
Report 2 (Group) [Min 7500 Words]	35
Report 3 (Group) [Min 7500 Words]	35
Quiz 1 (Group) [$\approx$ 4 Hours]	35
Quiz 2 (Group) [$\approx$ 4 Hours]	35
Quiz 3 (Group) [$\approx$ 4 Hours]	35
Project (440 pts = 44%)	
Project Proposal (Group)	10
Project 10% (Components & Libraries) [Group]	10
Project 20% (Assemblement & Script Skeletons) [Group]	10
Project 30% - 90% (7 milestones) [Group]	210 (30 each)
Project 100% (Fully Functional) [Group]	75
Project Non-code Recording (Group)	15
Project Code Recording (Individual)	35
Project Final Test (Group) [$\approx$ 4 Hours]	75
Total	**1000 points**

Week-by-Week Calendar (Fall 2025, Tuesdays)

Week	Content and Deadlines (Pay Attention to Varying Times)
1 — Sep 2	Lab 1 (10 pts) due 9:00 p.m.; Calculator 10% (10 pts) due 10:30 p.m.; Groups formed; Syllabus Quiz opens.
2 — Sep 9	Lab 2 (10 pts) due 9:00 p.m.; Calculator 20% (10 pts) due 10:30 p.m.; **Project Proposal (10 pts) due 5:00 p.m.**; Last chance to pass Syllabus Quiz.
3 — Sep 16	Lab 3 (15 pts) due 10:30 p.m.; Calculator 30% (35 pts) due 5:00 p.m.; **Project 10% (Components & Libraries) (10 pts) due 6:30 p.m.**
4 — Sep 23	Labs 4&5&Extra (15 pts) due 10:30 p.m.; Calculator 40% (35 pts) due 5:00 p.m.; Project 20% (10 pts) due 5:00 p.m.
5 — Sep 30	**Quiz 1 (35 pts) 6:00–10:30 p.m.**; Report 1 (35 pts) due 5:00 p.m.; Project 30% (30 pts) due 5:00 p.m.
6 — Oct 7	Calculator 50% (35 pts) due 5:00 p.m.; Project 40% (30 pts) due 5:00 p.m.
7 — Oct 14	Calculator 60% (35 pts) due 5:00 p.m.; Project 50% (30 pts) due 5:00 p.m.
8 — Oct 21	Calculator 70% (35 pts) due 5:00 p.m.; Project 60% (30 pts) due 5:00 p.m.
9 — Oct 28	**Quiz 2 (35 pts) 6:00–10:30 p.m.**; Report 2 (35 pts) due 5:00 p.m.; Project 70% (30 pts) due 5:00 p.m.
10 — Nov 4	Calculator 80% (35 pts) due 5:00 p.m.; Project 80% (30 pts) due 5:00 p.m.
11 — Nov 11	Calculator 90% (35 pts) due 5:00 p.m.; Project 90% (30 pts) due 5:00 p.m.; *Withdraw deadline: Mon Nov 10.*
12 — Nov 18	Calculator 100% (35 pts) due 5:00 p.m.; **Project 100% (75 pts) due 5:00 p.m.**
13 — Dec 2	**Quiz 3 (35 pts) 6:00–10:30 p.m.**; Report 3 (35 pts) due 5:00 p.m.; **Bonus Assignment (up to 65 pts) due 5:00 p.m.**
14 — Dec 9	**Due 5:00 p.m.:** Project Non-code Recording (15 pts) and Project Code Recording (35 pts). **Final Project Test (75 pts) 6:00–10:30 p.m. in class.**

Closing Statement

ECE 395 is demanding. Success requires punctuality, sustained engagement, close reading of announcements, disciplined teamwork, and strict adherence to deadlines. The bonus system rewards seriousness and engagement—students who commit fully will find it achievable. Historically, students who took announcements seriously and worked consistently earned strong outcomes.