ECE 445 Lecture 1 Spring 2026

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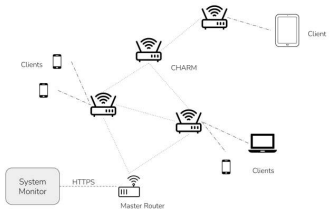
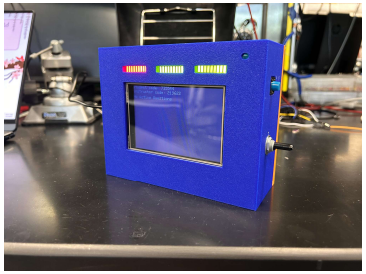
Lecture-1 Agenda

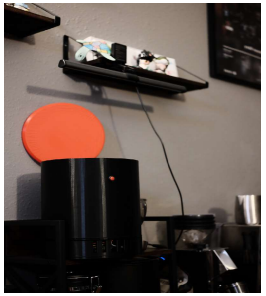
- 4:00 Course Overview – A. Fliflet
- 4:20 PCB Assignments – J. Jung
- 4:30 Intellectual Property – M. Chitambar
- 4:50 Writing – A. Greiger
- 5:05 Pitched Projects
  - Maggie Li – Sound Sleep
  - Paul Kwiat – POV + …
  - Viktor Gruev – Ant-weight Battlebots
  - Joy O'Keefe – Bat Sound Detector
  - Brian Mehdian – Adherascent Pill Dispenser
- 5:30 Summer is Coming – A. Fliflet

Introduction

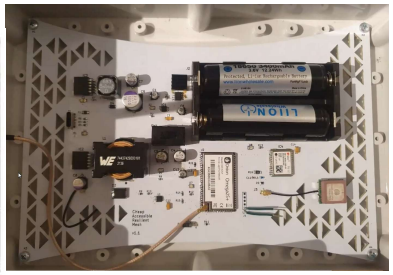
- Welcome to ECE 445, Senior Design Project Laboratory, the department's capstone course
- We expect you to carry out projects that are **unique**, **technically challenging**, and **completable** within the semester.



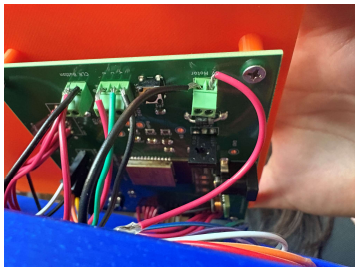




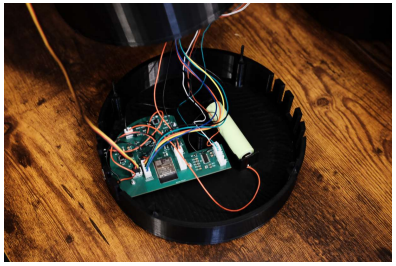
Illini Voyager (SP23)



CHARM (FA22)



Classroom Clarity (SP25)



CO2ffee(Sp25)

Course Outline

- **Introductory lectures, Q&A sessions, and class exercises** (weeks 1-4)
- **Project identification, team formation, and project approval** (weeks 1-3)
  - Propose a project idea or respond to a project pitch on the class **web board**
  - Form a project team
  - Prepare a **Request For Approval** (**RFA**)
  - Approved projects are assigned a TA and instructor
- **PCB training assignments** (weeks 1-3)
  - Learn to use KICAD to design a microprocessor-based PCB ready for fabrication
  - Solder components onto this PCB, download software, and demo operation
  - Extra credit assignment available
- **Project Proposal, Design Document, and Design Review** (weeks 3-7)
  - The proposal is a plan for your project, and its prescribed structure basically determines how you will describe and characterize your project.
  - Design Document adds design and project information and should be a complete manual for your project
  - Design Reviews of all projects are held in Week 7.

Course Outline continued

- **Project Design, fabrication, testing, and analysis** (weeks 4-14)
  - Circuit design, breadboard tests, PCB design and tests, software development, subsystem tests and integration
- **Breadboard Demo and Progress Demo** (weeks 8 and 12))
  - Team presents hardware-update on project to instructor and TA
- Throughout the project each student records work in their **Lab notebook** (10% of grade)
- **Demo**, **Final Presentation** and **Final Report** (weeks 15-16)
  - Demo: Team demonstrates a fully functioning, complete device with a working PCB
  - Final presentation gives project overview, highlights and conclusions
  - Final Report provides complete project documentation.
  - New: External judges will select award winning projects

Course Grading

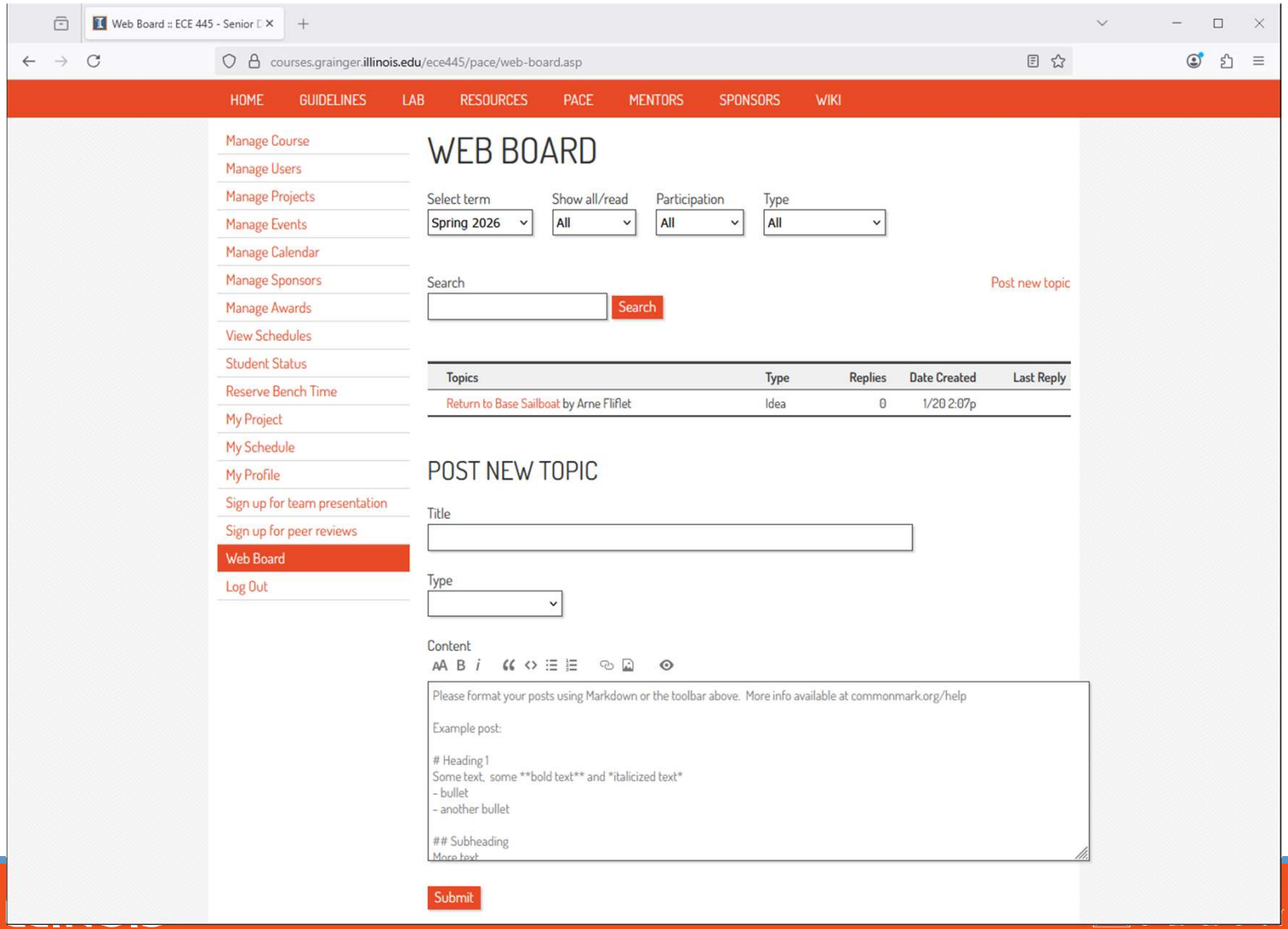
- Students receive a **team grade** for major assignments (Proposal, Design Doc, Demo, Presentation, Final Report)
- Students receive an **individual grade** for many assignments (initial post, lab notebook, IPR, peer reviews)
- Demo scores are used to determine A-level projects.
- Both individual and team scores contribute to the final grade and are weighted equally.
- Total points determine grades but percentages tend to be high and do not correspond conventionally to letter grades, i.e., a 95% point-percentage may not be an A.

Staff and Support Structure

- Each project will have three students, one TA, and one instructor
- Project teams meet weekly with their TA – the TA is the primary guide and point of contact for your project. Several projects may be mentored by ECE alumni.
- **Instructors**
  - Arne Fliflet, Viktor Gruev, Joohjung Kim, Craig Shultz, Yang Zhao
- **TAs**
  - Hossein Ataee, Gayatri Chandran, Shiyuan Duan, Lukas Dumasius, Manvi Jha, Jason Jung, Mingrui Liu, Wesley Pang, Chihun Song, Wenjin Song, Eric Tang, Bill Yang, Xiaodong Ye, Zhuoer Zhang, Frey Zhao
- **ECE Alumni Mentors:**
  - Jack Blevins – [217-390-1734, jacklouisblevins@gmail.com]
  - Marjorie Catt Plischster@gmail.com
  - Jonathan Ashbrook – Jonathan.Ashbrook@Coherent.com
- **Course Directors**
  - Professors Viktor Gruev and Michael Oelze

Getting a project approved

- All projects start on the Web Board
  - Each idea must first be presented on the Web Board
  - Professors, TAs, and other students critique and discuss each idea
  - The first student to pitch an idea is the owner of that idea
  - After sufficient discussion, an idea can become a Request for Approval (RFA)
- RFAs will be evaluated by staff and either approved or rejected
  - Projects must meet our criteria for complexity, uniqueness, and scope
  - Deadline for RFA approval is **February 5.**
  - This is not when you submit the RFA, but when it is accepted.
  - **5 points extra credit**: Early RFA approval by **January 29**


Web Board :: ECE 445 - Senior D
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Select term
Spring 2026
Show all/read
All
Participation
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POST NEW TOPIC
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Content
Please format your posts using Markdown or the toolbar above. More info available at commonmark.org/help
Example post:
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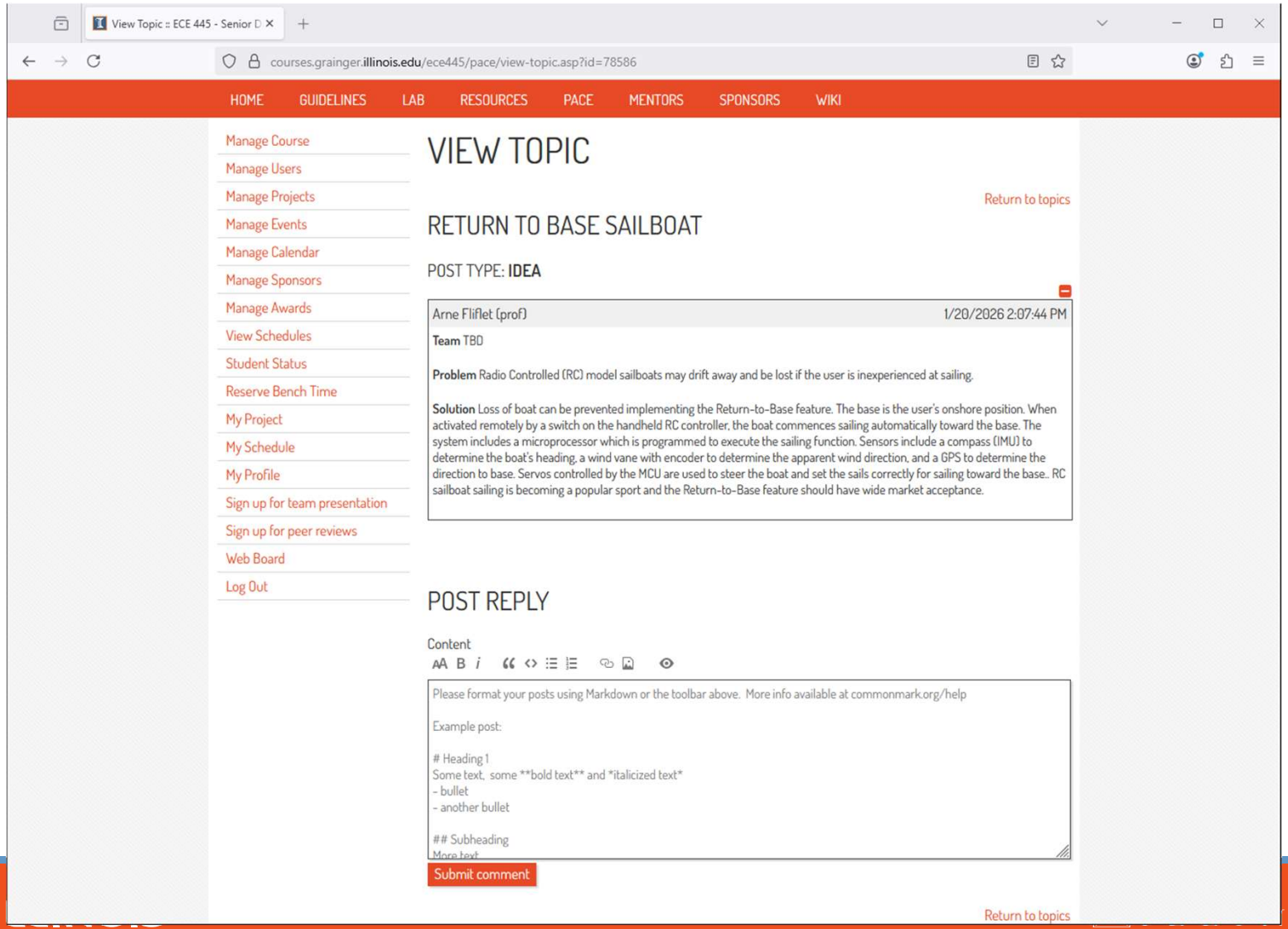
Some text, some **bold text** and *italicized text*
- bullet
- another bullet
Subheading
Submit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Reserve Bench Time
My Project
My Schedule
My Profile
Sign up for team presentation
Sign up for peer reviews
Web Board
Log Out
VIEW TOPIC
Return to topics
RETURN TO BASE SAILBOAT
POST TYPE: IDEA
Arne Fliflet (prof)
1/20/2026 2:07:44 PM
Team TBD
Problem Radio Controlled (RC) model sailboats may drift away and be lost if the user is inexperienced at sailing.
Solution Loss of boat can be prevented implementing the Return-to-Base feature. The base is the user's onshore position. When activated remotely by a switch on the handheld RC controller, the boat commences sailing automatically toward the base. The system includes a microprocessor which is programmed to execute the sailing function. Sensors include a compass (IMU) to determine the boat's heading, a wind vane with encoder to determine the apparent wind direction, and a GPS to determine the direction to base. Servos controlled by the MCU are used to steer the boat and set the sails correctly for sailing toward the base.. RC sailboat sailing is becoming a popular sport and the Return-to-Base feature should have wide market acceptance.
POST REPLY
Content
Please format your posts using Markdown or the toolbar above. More info available at commonmark.org/help
Example post:
Heading 1
Some text, some **bold text** and *italicized text*
- bullet
- another bullet
Subheading
Submit comment
Return to topics

Important Approaching Deadlines

- **First Web Board Posting: Thursday, January 22, 11:59 PM**
  - This is an **individual** assignment
- **Project approval: Thursday, February 5, 11:59 PM**
  - This is a **team** assignment
- Laboratory safety training and CAD assignment are also due during this time period