

Syllabus

EN.800.122 Engineering Innovation Research Program, Summer 2026

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About the Course

Description

Engineering Innovation Research (EN) is an exciting college-level summer program for motivated high school students with an aptitude in math and science and an interest in conducting research in engineering. This program is new and is being offered to high school students for the first time in Summer 2026. In the program, students learn how to conduct research by working with Johns Hopkins University (JHU) faculty in their laboratories and have the opportunity to earn JHU credit.

This course contains weekly pre-college discussion group meetings and research share-outs. This will enable students to develop skills via progressive deliverables including literature reviews, safety training, data collection and analysis, notebooks, a final poster, and final paper. Its objective is to introduce high school students interested in engineering to the fundamentals of laboratory research by emphasizing safety, data collection techniques, and literature search techniques and review by providing research experience in a faculty-led laboratory.

For more information, visit <https://ei.jhu.edu/programs/engineering-innovation-research-program/>.

Prerequisites

- High school algebra II and trigonometry
- High school chemistry or physics with a lab
- As and Bs in high school math and science courses

Objectives

- To understand laboratory safety protocols and best practices.
- To learn data collection techniques and their importance in research.
- To develop skills for reading and analyzing academic papers.
- To participate in experiments and collect data using appropriate tools and methods
- To analyze data and interpret results from experiments
- To create and present a poster and write a paper from research findings

Modules

- Lab Safety
- Data
- Academic Papers and Research Tools
- It's Research Time
- Research Activities and Data Collection
- Data Analysis and Interpretation
- Creating and Presenting a Poster
- Writing a Paper
- Reflections

Textbook and Lab Kit

This course does not have a textbook. All course materials are found on the course Canvas site or Microsoft Teams.

Teaching Team

For this course, you will be working with a faculty advisor, and their research team which may include postdoctoral fellows, PhD students, and undergraduate research assistants who will be your main points of contact. Once research placements have been made, we will provide you with the biographies and contact information for the research team you will be joining.

While your team will not be “on call” for the course, they will make every effort to respond to your questions and reply in a timely fashion. Once the course begins, **please make every effort to contact your team members through their preferred official JHU method of communication, either MS Teams or through email.**

Schedule

For the first week, you should expect to spend six hours per weekday completing the online introductory portion of the course.

You have chosen a 3-hour time block that works best for you for meeting with your research team. Meetings will be held via Zoom or Microsoft Teams. Please make sure you bring your questions to your daily meetings with your research team, so you are making satisfactory progress on your research projects.

Twice weekly, there will be group sessions where you will meet other students in the course and are able to share your progress on your projects. You will also be able to discuss general articles chosen by the research advisors with other students in the course.

A calendar with due dates is available in the Calendar area of the Canvas course menu. Unless otherwise noted, **all homework is due at 11:59 PM.**

Access

Computer Requirements

All students are granted a Microsoft Office 365 license during the program. Additionally, you will need access to a computer with the following capabilities:

- Ability to upload videos to the internet
- Reliable internet access
- Ability to download software that is required to complete research activities

Johns Hopkins Online Account

The Johns Hopkins Enterprise Directory (JHED) system is an online, comprehensive source of contact information for Johns Hopkins University faculty, staff, and students that grants access to the following resources:

- [Canvas](#) – access the course files
- [Microsoft Teams](#) – communicate with the class
- [Microsoft Office 365](#) – access Word, Excel, PowerPoint, OneDrive, etc.
- [myJHU](#) – view and update your student profile
- [SIS](#) – view your final grade at the end of the course
- [Library](#) – access online reference materials

Sign into these applications using JHEDID@jh.edu (**NOT @jhu.edu**) and your password.

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Sign in

jhedid@jh.edu

[Can't access your account?](#)

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← kborgsm1@jh.edu

Enter password

Password

[Forgot my password](#)

Sign in

New students should receive an email from the registrar containing their JHED ID shortly after enrollment. Instructions for activating the account are provided in the Online Account Activation

Instructions Form during course enrollment. Contact help@jhu.edu or call 410-516-HELP for assistance, if needed.

Canvas – Course Materials

All course materials will be provided through [Canvas \(canvas.jhu.edu\)](https://canvas.jhu.edu). Sign into Canvas using your JHEDID@jh.edu (**NOT @jhu.edu**) username and password. If you have difficulty logging in or accessing the course on Canvas, please contact the Help Desk at cmtshelp@jhu.edu.

The course materials are divided into modules, which can be accessed by clicking Modules on the Canvas course menu. A module will have several sections including the overview, lecture videos, discussions, and assignments. You will have access to the Canvas site for one month following the last day of class.

Microsoft Teams –Communication

This course will use Microsoft Teams for communication, including the online synchronous class meetings. This is [a platform that works in your browser, on your desktop, and has an app for tablet and phone \(iOS and Android\)](#), so you can participate from whatever device you are most comfortable. To access Teams in a browser, navigate to <https://teams.microsoft.com>.

Sign in with your JHU email using @jh.edu (**NOT @jhu.edu**) and JHU password. Your course Team will not be visible until the Saturday before the first day of class.

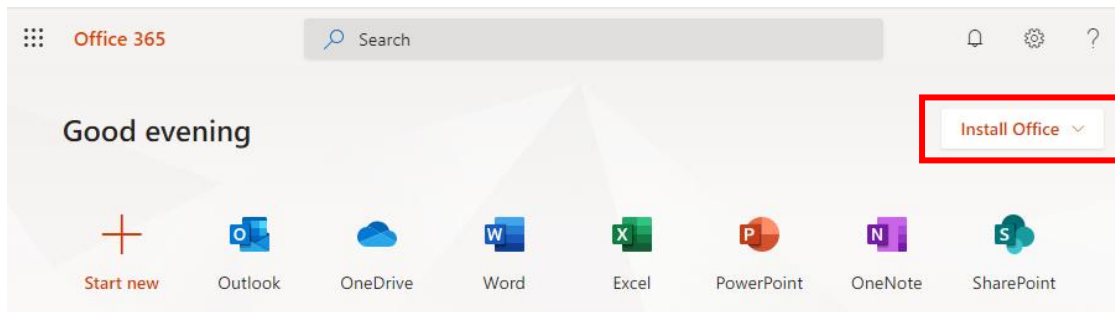
There are a few channels to organize discussion by topic. To customize your channel notifications, click the dots next to the channel name and select Channel notifications. You can also customize your notifications by going to Settings > Notifications (in desktop/browser, click your initials in the upper right-hand corner to find the Settings menu). Teams has many different notifications on its different platforms, so make sure you have them configured to get the communications you need.

For more information, check out the [Microsoft Support information](#) for getting started with Microsoft Teams. If you have difficulty logging in or accessing Microsoft Teams, please contact the Help Desk at cmtshelp@jhu.edu.

Microsoft Office 365 Software

While you are enrolled in the course, you will have access to the software included in the Microsoft Office 365 Suite such as Microsoft Word, PowerPoint, and Excel. You will need your JHED to download the software to your device.

- Go to <https://www.office.com> and click Sign In.
- Sign in using JHEDID@jh.edu (**NOT @jhu.edu**) and your password.
- When you land on the Office.com home screen, you can click Install Office in the upper right corner. Installing the software is optional; you can also use the web versions directly in the browser.



Communication


Course Announcements

Important announcements will be posted to Microsoft Teams and/or in Canvas. You should check for new announcements each day.

Public Questions via Teams Channels

Questions about the course should be posted in Microsoft Teams. Please refrain from sending private messages to your teachers about general course questions. Instead, ask questions in Microsoft Teams channels as much as possible so that the entire class can benefit from reading the answer. Your classmates might even know the answer to your question and respond to you before a teacher does! Students can post replies to questions from their peers, and this behavior is encouraged! In addition to written replies, it's also helpful to "like" posts by clicking on a post then selecting the thumbs-up icon.

Personal Questions via Teams Chat

Direct chat messaging should be reserved for content that is not relevant to the whole class (late assignment, accommodations, etc.). To start a chat group with your teaching team, select Chat on the left-hand menu of Teams and click the New Chat icon () above the chat list pane. Type in the names of all your teachers to add them to the group. **Please refrain from chatting with an individual teacher; instead, chat with the whole teaching team.**

Interacting with Peers

You are encouraged to discuss the course content with your peers. In addition to posting and replying to messages in the public Microsoft Teams channels, you can also use Microsoft Teams to chat with individual students or groups of students.

Be respectful and reach out to a teacher if you believe someone is behaving inappropriately. Recall that you are bound by the Academic Integrity policy for the duration of this course.

Canvas Notifications

Ensure you don't miss any important notifications by [choosing your preferred email address](#) and customizing your Canvas notification settings to notify you of changes immediately or as part of a daily summary. See the [Canvas Notifications guide](#) for more information.

Grading

Submission Format

Documents should be submitted in PDF format. Videos should be created in .mp4 or .mov formats, [uploaded to Panopto](#) and shared via Canvas.

Typed submissions are preferred, but handwritten work can be scanned or photographed and included within a Word document. One option is to use a program like [CamScanner](#) to digitize handwritten work. Please take the time to ensure scans are not blurry, handwriting is legible, pictures are not sideways, and text and photos are not too small.

Late Policy

Do not wait until the last minute to upload your work to Canvas! Large video files may take an hour or more to upload.

Because this course moves at a fast pace, submitting work late is problematic. Often, feedback received on an earlier assignment can be used to improve your work on later assignments, so receiving delayed feedback can have downstream effects. Care has been taken to ensure all due dates allow time for you to attempt the assignment and ask questions if needed. After that, a 2% late penalty will be applied every hour the assignment is late. Please note that this deduction is from the total score possible, not a 2% deduction off your graded score, e.g. an assignment worth 110 points that is 25 hours late that you missed 20 points on would be $110 \times (1 - (25 \times 0.02)) - 20 = 35$, not $(110 - 20) \times (1 - (25 \times 0.02)) = 45$.

Exceptions can be made for genuine hardships experienced during the course, so please contact your teaching team as soon as possible to let them know why an assignment is or will be late if you believe you should get an exception. Exceptions may be made after the due date/time for true emergencies when communication in advance is not possible. Please review [the absence policy](#) for further details.

Grade Questions and Regrade Policy

You may submit work to be regraded if you feel there is an error in how it was graded. Requests should be made via Teams chat with the teaching team within 48 hours of the grade being posted in Canvas. You should indicate what portion of the work should be regraded and explain the rationale for your request. The new grade may be higher, the same, or lower than the original grade. Once work is regraded, it may not be submitted for another regrading analysis.

Grade Calculation

Final grades will be determined by the following weighting:

Item	% of Grade
Participation	12%
Assignments	43%
Reflections	8%

Poster	19%
Final Paper	18%
TOTAL	100%

Final Grade Letters

Your grading scheme—chosen at the time of enrollment—is either a Letter Grade or Satisfactory/Unsatisfactory Grade. You can switch grading schemes by submitting a [request to the Registrar](#) on or before the deadline. The deadline for Summer 2026 is July 23.

The final grade letter or S/U is based on the final grade percentage according to the table below.

Letter Grade	S/U Grade
97% ≤ A+	Satisfactory (S): 70% and above
93% ≤ A < 97%	
90% ≤ A- < 93%	
87% ≤ B+ < 90%	
83% ≤ B < 87%	
80% ≤ B- < 83%	
77% ≤ C+ < 80%	
73% ≤ C < 77%	
70% ≤ C- < 73%	
67% ≤ D+ < 70%	
63% ≤ D < 67%	Unsatisfactory (U): Below 70%
F < 63%	

Major Deliverables

Final Poster

You will be required to create a poster which summarizes your research during the course. A draft will be due during Week 4 and will be 5% of your grade. The final poster will be due during Week 5, and you will get an opportunity to present your poster at a poster session on July 24. The final poster will be 10% of your grade and presentation of the poster will be the remaining 4%.

The deliverables for the Poster are the draft poster with placeholders for any data that you are awaiting, and the Final poster which is fully complete and will be presented on the last day of Week 5.

The points for this poster are allocated as follows:

- 100 pts – Draft Poster

- 280 pts – Final Poster and Presentation

In total, deliverables for the Poster are worth 380 points.

Posters completed as part of this course are not considered independent research and do not meet the threshold for publication.

Final Paper

During the last week of the course, you will work on a final paper. Complete final papers should include abstract, introduction, methods, results, discussion and references sections. You will be guided by your research team throughout this process.

Final papers will be submitted in Canvas and must be uploaded by 11:59 PM EST on July 31.

The final paper will be worth 200 points and will be due on the last day of the course.

Papers completed as part of this course are not considered independent research and do not meet the threshold for publication.

Reflections

During Weeks 2 through 5, you will submit weekly reflections worth 20 points each where you will include how you feel about what you learned during the week and how it will fit in with your college and career goals. You may also include what you would have done differently during the week if you had a chance to do it all over again.

After completing your final paper, you will also be required to submit your final reflections on the course. This final reflection will be worth 80 points.

Assignments

Assignments are activities designed to help keep you on track throughout the course. They also help you with your writing skills as you are preparing to write a paper at the end of the course. You should complete assignments on your own, not in a group.

Assignments can be found in the corresponding Canvas modules. You are required to submit your work to Canvas as a PDF file.

Each of the following assignments is worth 60 points:

- Introductory Research Journal Article Summary Assignment
- Research Journal Article Summary Assignment
- Lab Safety Course Assignment
- Library Research Assignment
- Data Assignment
- Group Meeting Assignment (Weeks 2, 3 and 4)
- JHU Library Research Assignment
- Important Safety Considerations Assignment
- Important Methods, Equipment and Materials Survey Assignment

Other Assignments include:

- Final Poster Peer Review Assignment – 80 points
- Notebook Assignment – 120 points

In total, the assignments are worth 860 possible points.

Participation

Engineering is a collaborative activity that requires active participation. During the first four weeks, you will have a chance to meet all the other students in the course for a weekly discussion. In the first week, you will learn how to keep a notebook. For the remaining weeks, you will discuss topics and articles chosen by the teaching team. Active participation is required during these group sessions to receive full points on each of these days.

A total of 60 points will be awarded for active participation in each of these sessions.

Policies

Academic Integrity

All students are required to read, know, and comply with the Procedures for Dealing with Issues of Academic Misconduct as detailed in the enrollment form you signed.

This policy prohibits academic misconduct, including but not limited to the following: cheating, plagiarism, submitting the same or substantially similar work to satisfy the requirements of more than one course without permission, submitting as one's own the same or substantially similar work of another, knowingly furnishing false information to any agent of the University for inclusion in academic record, falsification, forgery, alteration, destruction or misuse of official University documents or seal.

While we encourage you to collaborate with your fellow students, all work submitted must be fully your own. Lab reports, assignments, quizzes, and projects must be done on your own. Direct copying of written work or computer code is considered cheating and will result in a grade of zero on the assignment and could result in failing the course.

Plagiarism is defined as taking the words, ideas, or thoughts of another and representing them as one's own. If you use the words of another, present the words in the correct quotation notation (indentation or enclosed in quotation marks, as appropriate) and include a complete citation to the source.

For the full Academic Misconduct policy, see [the Pre-Collegiate Programs Academic Ethics Policy and Procedures](#).

Generative Artificial Intelligence (AI) Tools

Use of generative artificial intelligence (AI) tools such as ChatGPT can augment learning experiences when used appropriately. You may use generative AI to brainstorm and refine ideas, find reliable sources, outlines, check grammar, and format bibliographies. You should note, however, that the material generated by these programs may be inaccurate, incomplete, biased, or otherwise problematic. You are ultimately responsible for what you submit.

Use your interaction with AI as a learning experience. Then, let your submitted work reflect your improved understanding. All writing and calculations you submit must be your own. Beyond bibliographies, you are not allowed to copy and paste material generated by AI and use it in your

submitted work. Including AI-written content in any part of your submitted work will be considered academic misconduct.

If you are going to use a generative AI tool for one of the above-mentioned scenarios, a project where its use is suggested in the course, or another situation approved by your instructor, [HopGPT](#) offers members of Johns Hopkins community secure and easy access to Large Language Models (LLMs) from industry leaders including OpenAI, Anthropic, and Meta. Developed by IT@JH, this secure environment mitigates security and privacy risks while allowing you to interact with LLMs. For more information on how to use this tool, see the [HopGPT Quick Start Guide](#).

Disability Services

Johns Hopkins University and the Engineering Innovation program are committed to making all courses, support services, and facilities accessible to students with disabilities. If you will need disability related accommodations, you will need to start the process of requesting accommodations with the [Student Disability Services](#) (SDS) and provide documentation of your disability as well as your need for accommodations. It is recommended that Engineering Innovation students complete this step as early as possible to ensure there is time to request and implement accommodations..

Learn about [how to get started with student disability services](#) and/or contact [Student Disability Services](#) for more information.

Discrimination and Harassment

JHU will not tolerate harassment, sexual harassment (including sexual violence), discrimination or retaliation in the workplace or educational environment whether committed by managers, faculty, administrators, staff, or students, or by visitors to our institution of higher learning. If you are a victim of any such situation, you are strongly encouraged to file a complaint through official university channels.

You may reach out to the Engineering Innovation office at ei@jhu.edu or submit a [Discrimination and Harassment Report Form](#) to the JHU Office of Institutional Equity.