

Syllabus—CENG 4950, 2026 Spring-Summer

Course title: Chem-E-Car

Weekly progress meeting: 2pm Tuesday, room 4568

Instructors:

Zhengtang Tom Luo,

Marshal Liu;

Tim Tang (ketim@ust.hk)

TA: Mose Chen (zchenif@connect.ust.hk)

Office hours: Monday thru Thursday early afternoon (by appointment please)

Course description:

CENG 4950 is a platform for entry-level engineer students to participate student competition for chemical engineers. The competitions mainly includes Chem-E-Car competition, i.e. to design and construct a car powered by a chemical or biochemical energy source, that will safely carry a specified load over a given distance and stop. Students are encouraged to identify competitions and talk to the instructor to include in this course. The objective of this course is to develop the ability to control an electrochemical reaction, and to obtain hands-on experience on a practical engineering project, especially in chemical engineering field. Students will be given the opportunity to interact with each other, to integrate the learning experience to design and build a device/product/process, a business entity or other forms. Students will have chance to prepare for starting their future career in engineering. It is a student-led project, designed to motivate students for engineers. Enrollment in the project course require instructor's approval. May be graded PP.

Teaching Objectives and expected outcomes:

The objectives of this course is to obtain hands-on experience on the design and build a device/product/process, a business entity or other forms. After this course, students should be familiar with how to work on a real engineering project to solve a problem.

Specifically they will be able

- 1) To perform a wide range of design, fabricate and test in the contemporary chemical engineering laboratory;
- 2) To develop team work experience and learn how to divide project duties ensuring efficiency and quality of the final results;
- 3) Ability to problem-solve, troubleshoot, and analysis results, and use statistical tactics for data evaluating;
- 4) To conduct project with professional ethics;
- 5) To use knowledge of engineering, science and technology to solve practical problems;
- 6) Communicate effectively to ensure accurate and appropriate information transfer;
- 7) Manage an engineering project for quality assurance and continual improvement, laboratory practice, budget, schedule, and appropriate composure under stressful conditions.
- 8) Reinforce their interest for learning, experiencing pleasure in acquiring knowledge and skills, thru the guidance on students' academic and personal development.

Requirements:

Students are expected to spend at least 9 hours/week in the laboratory and complete all assignments.

Course Contents

Laboratory work: Work plan, lab performance, biweekly progress report and final report.

Competition: Video, poster and final competition.

Grading:

Graded Distinction/Pass/Fail based on the marking scheme below.

	Type	Time	Weighting	Format
• Weekly report	Group	Bi-week	20%	Work content, please submit on canvas
• Spring trial	Group	End of the Spring semester (12/5)	40%	Trial
• Final trial	Group	End of the summer semester	20%	Trial
• Team work, efforts and contribution	Individual	End of the semester	20%	Peer evaluation

Criteria	Excellent (9-10/18-20 points)	Proficient (7-8/14-17 points)	Developing (5-6/10-13 points)	Needs Improvement (0-4/0-9 points)
Performance and Functionality	The project performs exceptionally well, meeting or exceeding all objectives.	The project performs well and meets most objectives.	The project performs adequately but fails to meet some key objectives.	The project performs poorly and fails to meet most objectives.
Achievement of Objectives	The trial clearly demonstrates the successful achievement of the project's goals.	The trial demonstrates the achievement of most of the project's goals.	The trial demonstrates the achievement of some of the project's goals.	The trial does not demonstrate the achievement of the project's goals.
Teamwork and Presentation	The team works together seamlessly and presents their project with confidence and clarity.	The team works together effectively and presents their project clearly.	The team shows some evidence of teamwork, but the presentation is unclear in places.	The team does not work well together, and the presentation is poor.

This course employs a Criterion-Referenced Assessment (CRA) approach.

This means your grade is determined by how well your work meets a set of pre-defined and transparent learning objectives and standards. These standards are detailed in the grading rubrics provided for each

assessment component. Your performance is measured against these criteria, not against the performance of your classmates.

We do not use norm-referencing or "grading on a curve." There is no competition for a limited number of high grades. Every student has an equal opportunity to achieve a high grade by demonstrating they have met the standards outlined in the rubrics. The goal is to reward your learning and achievement of the course objectives.

Artificial Intelligence (AI) Policy:

The use of generative AI tools is permitted in this course to assist with your project work. However, you must adhere to the following principle: AI is a tool to assist, not replace, your own effort and critical thinking.

Mandatory Declaration Requirement:

If you use an AI tool for any part of your assignment (e.g., for brainstorming, writing assistance, or data analysis), you must declare its use.

- How to Declare: You are required to take a screenshot of your interaction with the AI tool (including your prompt and the AI's generated output).
- Where to Declare: This screenshot must be attached as an appendix to your submitted work (e.g., your report, poster, etc.).

Failure to declare the use of AI by providing the required screenshot will be considered a violation of academic integrity and will be handled according to university policy. You are responsible for all content you submit.

References:

<https://www.aiche.org/community/students/chem-e-car>

Additional course-packet provided on Canvas.