ENGINEERING
McMaster-Mohawk
Bachelor of Technology
Partnership

McMaster University

Course Outline

1. COURSE INFORMATION

Session Offered	Winter 2022	
Course Name	Capstone Design I	
Course Code	AUTO TECH 4TR1	
Date(s) and Time(s) of lectures	C01: Fri 11:30 am – 2:20 pm, Online/In-person C02: Fri 11:30 am – 2:20 pm, Online/In-person C03: Wed 3:30 pm – 6:20 pm, Online/In-person C04: Wed 3:30 pm – 6:20 pm, Online/In-person January 10 – April 12, 2022	
Program Name	Automotive and Vehicle Engineering Technology	
Calendar Description	This course requires students to research, design, develop, and implement an independent project and continues as Capstone Design II. The project plan and a model developed will be documented as a technical report and presented in a seminar.	
Instructor(s)	Dr. Moein Mehrtash C01 Dr. Timber Yuen C02, C04 Dr. Lucian Balan C03	Office: MARC 270 (Dr. Timber Yuen) Office: MARC 271 (Dr. Lucian Balan) Office: MARC 273 (Dr. Moein Mehrtash) E-Mail: as indicated by instructor

2. COURSE SPECIFICS

Course Description

Students will work in groups to design and develop a plan to implement a technical project. By the end of the course, the students will have produced a technical design and a detailed technical report. The students will have lab time to define/identify a problem that will be solved through the projects; perform background research; define the project specifications; perform brainstorming activities; identify and evaluate several solutions; select a solution; prepare a CAD model and, if appropriate, an electronic schematic; identify and source the materials needed to develop the physical model; create a Bill Of Materials (BOM); order components; and perform hardware and software experimentation and testing. Detailed design steps and an updated Gantt chart will be documented weekly in a logbook. A technical report will serve as a guide for the implementation of the design project.

Instruction Type

Code	Type	Hours per term
C	Classroom instruction	
L	Laboratory, workshop or fieldwork	36
T	Tutorial	
DE	Distance education	
	Total Hours	36

Resources

ISBN	Textbook Title & Edition	Author & Publisher
ISBN:		

Other Supplies	Source

Prerequisite(s)	AUTOTECH 3AV3, 3MV3, 3VD3, GENTECH 3MT3, and registration in level IV of the Automotive and Vehicle Engineering Technology program
Corequisite(s)	
Antirequisite(s)	
Course Specific Policies	Communication: • E-mail communication for this course is through McMaster Mail Project: • Project work must be completed in groups of 3 students. Larger (or smaller) groups require instructor's approval. • Students in the same group must have a similar co-op situation. • Students are allowed to submit own proposals for project topic, but they need to meet specific criteria and must be approved by the instructor. • The instructor can suggest alternate topics if the proposed topic by the students is not compatible with course requirements, or it does not meet the expected outcomes. • The available budget for the project will be communicated by instructor. Any purchase must be approved by the instructor. Weekly Project Meeting: • Weekly project meetings are mandatory, project meetings will be online/in-person. • At project meetings students are responsible to present and discuss with instructor their current project progress Logbook Submission: • Each student will keep a logbook of work performed each week outside and inside the lab/classroom. Generally, the logbook will document the project progress, accomplished task, learned outcomes, recommendations and actions to be taken. • It is expected that each student will also work on their project outside the assigned classroom/lab time. These activities will be recorded in the logbook. The logbook will be reviewed by the instructor at each project meeting. • Weekly Logbook submissions are mandatory • Logbook type of submission is only electronic! A word template is provided for the logbook, on Avenue. • Weekly logbook must be uploaded to the specified Dropbox. Final Report: • The final report is individual submission showing each student's contribution to the project. • The final report is submitted as an electronic copy. Department Policies: • Students may be required to purchase components on their own, and they will be reimbursed at the end of the term, providing that the components are returned in working order and the original receipts are submitted. • The final prototype (if applicable) belongs to the department unless the students decide to pay for the entire cost of the project themselves.

Departmental Policies	Students must maintain a GPA of 3.5/12 to continue in the program. In order to achieve the required learning objectives, on average, B.Tech. students can expect to do at least 3 hours of "out-of-class" work for every scheduled hour in class. "Out-of-class" work includes reading, research, assignments and preparation for tests and examinations. Where group work is indicated in the course outline, such collaborative work is mandatory. The use of cell phones, iPods, laptops and other personal electronic devices are prohibited from the classroom during the class time, unless the instructor makes an explicit exception. Announcements made in class or placed on Avenue are considered to have been communicated to all students including those individuals that are not in class. Instructor has the right to submit work to software to identify plagiarism.

3. SUB TOPIC(S)		
Week 1	Introduction, project topics	Jan 10 – 14, 2022
Week 2	Project and time management, project selection, team formed by end of the week	Jan 17 – 21, 2022
Week 3	Literature search, preliminary project proposal	Jan 24 – 28, 2022
Week 4	One-to-one meetings and discussions	Jan 31 – 4, 2022
Week 5	One-to-one meetings and discussions	Feb 7 – 11, 2022
Week 6	One-to-one meetings and discussions	Feb 14 – 18, 2022
	Study Break	Feb 21 – 25, 2022
Week 7	Midterm Report, project work	Feb 28 – 4, 2022
Week 8	Project work	Mar 7 – 11, 2022
Week 9	Project work	Mar 14 – 18, 2022
Week 10	Project work	Mar 21 – 25, 2022
Week 11	Project work	Mar 28 – Apr 1, 2022
Week 12	Projects presentation	Apr 4 – Apr 8, 2022
Week 13	Final project report submission	April 11 – 12, 2022

Classes end: Tuesday, April 12th 2022

Final Examination Period: Thursday, April 14 to Friday, April 29

All examinations MUST be written during the scheduled examination period.

Note that this structure represents a plan and is subject to adjustment term by term.
The instructor and the University reserve the right to modify elements of the course during the term. The University may change the dates and deadlines for any or all courses in extreme circumstances. If either type of modification becomes necessary, reasonable notice and communication with the students will be given with explanation and the opportunity to comment on changes.

4. ASSESSMENT OF LEARNING *including dates*	Weight
Logbook Records and Meeting Participation (individual) - weekly	**10%**
Midterm Report (one per group) – week 7	**30%**
Project Presentation and Demo – week 12	**10%**
Final Report and Prototype Videos Submission (individual) – week 13	**50%**
TOTAL	**100%**

Percentage grades will be converted to letter grades and grade points per the University calendar.

5. LEARNING OUTCOMES

1. Design a technical project related to automotive engineering with real-world applications using mechanical, electrical, electronic, and software components.
2. Work in teams of three (or two or four under special certain circumstances) to achieve a more complicated design than is possible working individually.
3. Apply team building and project management skills for managing complex technical designs. Develop good communications skills and learn to present engineering ideas in a collaborative environment.
4. Generate technical reports and proposals to illustrate design plans using an accurate technical language in appropriate report formats.
5. Deconstruct a technical problem into its constituent parts to systematically solve issues and incrementally move towards achieving an objective.
6. Judge the relevance of a design for its practicality and necessity in real-world applications.
7. Create clear and coherent presentation slides to illustrate the basic design features of the technical report, and clearly communicate and verbalize the proposed concepts of the design.

6. COURSE OUTLINE – APPROVED ADVISORY STATEMENTS

ANTI-DISCRIMINATION

The Faculty of Engineering is concerned with ensuring an environment that is free of all discrimination. If there is a problem, individuals are reminded that they should contact the Department Chair, the Sexual Harassment Officer or the Human Rights Consultant, as soon as possible.
http://www.mcmaster.ca/policy/General/HR/Discrimination_Harassment_Sexual_Harassment-Prevention&Response.pdf

ACADEMIC INTEGRITY

You are expected to exhibit honesty and use ethical behaviour in all aspects of the learning process. Academic credentials you earn are rooted in principles of honesty and academic integrity. It is your responsibility to understand what constitutes academic dishonesty.

Academic dishonesty is to knowingly act or fail to act in a way that results or could result in unearned academic credit or advantage. This behaviour can result in serious consequences, e.g. the grade of zero on an assignment, loss of credit with a notation on the transcript (notation reads: “Grade of F assigned for academic dishonesty”), and/or suspension or expulsion from the university. For information on the various types of academic dishonesty please refer to the Academic Integrity Policy, located at https://secretariat.mcmaster.ca/university-policies-procedures-guidelines/

The following illustrates only three forms of academic dishonesty: The following illustrates only three forms of academic dishonesty:

- plagiarism, e.g. the submission of work that is not one’s own or for which other credit has been obtained.
- improper collaboration in group work.
- copying or using unauthorized aids in tests and examinations.

AUTHENTICITY / PLAGIARISM DETECTION

Some courses may use a web-based service (Turnitin.com) to reveal authenticity and ownership of student submitted work. For courses using such software, students will be expected to submit their work electronically either directly to Turnitin.com or via an online learning platform (e.g. A2L, etc.) using plagiarism detection (a service supported by Turnitin.com) so it can be checked for academic dishonesty.

Students who do not wish their work to be submitted through the plagiarism detection software must inform the Instructor before the assignment is due. No penalty will be assigned to a student who does not submit work to the plagiarism detection software. All submitted work is subject to normal verification that standards of academic integrity have been upheld (e.g., on-line search, other software, etc.). For more details about McMaster's use of Turnitin.com, please go to www.mcmaster.ca/academicintegrity.

COURSES WITH AN ON-LINE ELEMENT

Some courses may use on-line elements (e.g. e-mail, Avenue to Learn (A2L), LearnLink, web pages, capa, Moodle, ThinkingCap, etc.). Students should be aware that, when they access the electronic components of a course using these elements, private information such as first and last names, user names for the McMaster e-mail accounts, and program affiliation may become apparent to all other students in the same course. The available information is dependent on the technology used. Continuation in a course that uses on-line elements will be deemed consent to this disclosure. If you have any questions or concerns about such disclosure please discuss this with the course instructor.

ONLINE PROCTORING

Some courses may use online proctoring software for tests and exams. This software may require students to turn on their video camera, present identification, monitor and record their computer activities, and/or lock/restrict their browser or other applications/software during tests or exams. This software may be required to be installed before the test/exam begins.

COMMUNICATIONS

It is the student's responsibility to:

- Maintain current contact information with the University, including address, phone numbers, and emergency contact information.
- Use the University provided e-mail address or maintain a valid forwarding e-mail address.
- Regularly check the official University communications channels. Official University communications are considered received if sent by postal mail, by fax, or by e-mail to the student's designated primary e-mail account via their @mcmaster.ca alias.
- Accept that forwarded e-mails may be lost and that e-mail is considered received if sent via the student's @mcmaster.ca alias.
- Check the McMaster/Avenue email and course websites on a regular basis during the term.

CONDUCT EXPECTATIONS

As a McMaster student, you have the right to experience, and the responsibility to demonstrate, respectful and dignified interactions within all of our living, learning and working communities. These expectations are described in the Code of Student Rights & Responsibilities (the "Code"). All students share the responsibility of maintaining a positive environment for the academic and personal growth of all McMaster community members, whether in person or online.

It is essential that students be mindful of their interactions online, as the Code remains in effect in virtual learning environments. The Code applies to any interactions that adversely affect, disrupt, or interfere with reasonable participation in University activities. Student disruptions or behaviours that interfere with university functions on online platforms (e.g. use of Avenue 2 Learn, WebEx or Zoom for delivery), will be taken very seriously and will be investigated. Outcomes may include restriction or removal of the involved students' access to these platforms.

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ACADEMIC ACCOMMODATION OF STUDENTS WITH DISABILITIES

Students with disabilities who require academic accommodation must contact Student Accessibility Services (SAS) at 905-525-9140 ext. 28652 or sas@mcmaster.ca to make arrangements with a Program Coordinator. For further information, consult McMaster University's Academic Accommodation of Students with Disabilities policy.

REQUESTS FOR RELIEF FOR MISSED ACADEMIC TERM WORK

McMaster Student Absence Form (MSAF): In the event of an absence for medical or other reasons, students should review and follow the Academic Regulation in the Undergraduate Calendar "Requests for Relief for Missed Academic Term Work".

ACADEMIC ACCOMMODATION FOR RELIGIOUS, INDIGENOUS OR SPIRITUAL OBSERVANCES (RISO)

Students requiring academic accommodation based on religious, indigenous or spiritual observances should follow the procedures set out in the RISO policy. Students should submit their request to their Faculty Office normally within 10 working days of the beginning of term in which they anticipate a need for accommodation or to the Registrar's Office prior to their examinations. Students should also contact their instructors as soon as possible to make alternative arrangements for classes, assignments, and tests. http://www.mcmaster.ca/policy/Students-AcademicStudies/Studentcode.pdf

COPYRIGHT AND RECORDING

Students are advised that lectures, demonstrations, performances, and any other course material provided by an instructor include copyright protected works. The Copyright Act and copyright law protect every original literary, dramatic, musical and artistic work, including lectures by University instructors

The recording of lectures, tutorials, or other methods of instruction may occur during a course. Recording may be done by either the instructor for the purpose of authorized distribution, or by a student for the purpose of personal study. Students should be aware that their voice and/or image may be recorded by others during the class. Please speak with the instructor if this is a concern for you.

EXTREME CIRCUMSTANCES

The University reserves the right to change the dates and deadlines for any or all courses in extreme circumstances (e.g., severe weather, labour disruptions, etc.). Changes will be communicated through regular McMaster communication channels, such as McMaster Daily News, A2L and/or McMaster email.