

Course Outline

1. COURSE INFORMATION			
Session Offered	Fall 2020		
Course Name	Capstone Design II		
Course Code	AUTO TECH 4TR3		
Date(s) and Time(s) of lectures	C01: Tue 2:30 pm – 6:20 pm, Marc 267 (on-line) C02: Fri 2:30 pm – 6:20 pm, Marc 268 (on-line) C03: Fri 2:30 pm – 6:20 pm, Marc 267 (on-line) C04: Tue 2:30 pm – 6:20 pm, Marc 268 (on-line)		
Program Name	Automotive and Vehicle Engineering Technology		
Calendar Description	This course is a continuation of Capstone Design I and it requires the students to conduct further research, modify/refine the project design, develop and implement the independent project proposal submitted as a part of the Capstone Design I course. The project plan and the 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 271 (on-line) Office: MARC 273 (on-line) Office: MARC 270 (on-line) E-Mail: as indicated by instructor	
2. COURSE SPECIFICS			
Course Description	Students will work in groups to design, develop, and implement a technical project. Students will spend 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 (on-line)	36
	L	Laboratory, workshop or fieldwork (on-line)	12
	T	Tutorial	
	DE	Distance education	
	Total Hours		48
Resources	ISBN	Textbook Title & Edition	Author & Publisher
	ISBN:		
	Other Supplies	Source	
	PC/Laptop with webcam	Students must have own computer and adequate internet bandwidth for remote access of software and for on-line meetings and presentations	
Prerequisite(s)	AUTOTECH 4AE3, 4EC3, 4TR1		

Corequisite(s)	N/A
Antirequisite(s)	N/A
Course Specific Policies	<p>Weekly Project Meeting:</p> <ul style="list-style-type: none"> • Weekly project meetings (on-line) are mandatory • Students need to meet their instructor (on-line) and discuss project status in order to receive the corresponding credit <p>Logbook Submission:</p> <ul style="list-style-type: none"> • Each student will keep a logbook recording for the work performed outside and inside the lab/classroom. • Each student is expected to work on the project a significant amount of time beside the regular classroom hours. • Generally, the logbook will document project progress, accomplished tasks, learned outcomes, recommendations, and actions to be taken. • Due dates and acceptable format for logbook submission will be discussed by each instructor at the beginning of the course. <p>Mid-term Report:</p> <ul style="list-style-type: none"> • The midterm report is written and submitted individually. It should include only the work done by the student and reflect individual contribution to the project since the beginning of current term. • The content and evaluation rubrics for the midterm report will be communicated to the students by the instructor. <p>Final Report:</p> <ul style="list-style-type: none"> • The final report is written and submitted individually. It should include only the work done by the student and reflect his/her solely contribution to the project since the beginning of the project. It should include the work done in both terms. • The content and evaluation rubrics for the final report will be communicated to the students by the instructor. • The final report is submitted in electronic format and as a bounded hardcopy. Students are responsible for covering the cost of printing and binding. • The submitted hardcopy report becomes the property of the department and will not be returned to students. <p>Final Project Demonstration:</p> <ul style="list-style-type: none"> • Students will present their final project to an assessment committee at the end of the term, at a date that will be communicated by the instructor. • A functional prototype or simulation must be demonstrated to the assessment committee. • Students are required to make a poster that summarizes their project achievements and results.

	<p>Requirements:</p> <ul style="list-style-type: none"> • All students working in the manufacturing lab must follow the department safety policy (if applicable). • Students are required to book in advance the manufacturing equipment needed for prototyping their capstone project (if applicable). • Access to machine-shop is permitted only during the regular lab time. Exceptions require specific approval from the instructor (if applicable). • The project budget is limited; the budget cap is communicated at the beginning of the term. Any purchase beyond the established limit must be approved by the instructor. • Purchased components within the budget limits are reimbursed at the end of the term, providing that items are returned in working order and the original receipts are submitted. • For any project work that requires specific licensed software, the instructor will arrange for access (on-line) to computer lab. The university is not responsible for providing individual licenses to students for completing their capstone work. • 3D Printing of materials for capstone project is run by a designated TA. Students must submit their 3D printing requests on Avenue. Priority for printing is granted on first-come-first-served basis (if applicable). • The final prototype (if applicable) belongs to the department unless the students decide to pay for the entire cost of the project themselves.
<p>Departmental Policies</p>	<p>Students must maintain a GPA of 3.5/12 to continue in the program.</p> <p>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.</p> <p>Where group work is indicated in the course outline, such collaborative work is mandatory.</p> <p>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.</p> <p>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.</p>
<p>3. SUB TOPIC(S)</p>	
<p>Week 1</p>	<p>Project Work & Consultation</p>
<p>Week 2</p>	<p>Project Work & Consultation</p>
<p>Week 3</p>	<p>Project Work & Consultation</p>
<p>Week 4</p>	<p>Project Work & Consultation</p>
<p>Week 5</p>	<p>Project Work & Consultation</p>
	<p>Study Break</p>

Week 6	Project Work & Consultation, Midterm Report due: Saturday Oct 24 @ 11:59 pm	Oct 19 – 23, 2020
Week 7	Project Work & Consultation	Oct 26 – 30, 2020
Week 8	Project Work & Consultation	Nov 2 – 6, 2020
Week 9	Project Work & Consultation	Nov 9 – 13, 2020
Week 10	Project Work & Consultation	Nov 16 – 20, 2020
Week 11	Project Work & Consultation, Poster submission	Nov 23 – 27, 2020
Week 12	Project Presentation & Demo	Nov 30 – Dec 4, 2020
Week 13	Final Report & Prototype Submission	Dec 7 – 9, 2020

Midterm Recess: Monday, October 12 to Sunday, October 18
 Classes end: Wednesday, December 9
 Final examination period: Thursday, December 10 to Wednesday, December 23
 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
Midterm Report (individual) – week 6	20%
Logbook Records and Meeting Participation (individual) - weekly	10%
Poster (group) – week 11	10%
Project Presentation and Demo – week 12	10%
Final Report and Prototype (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 experimental projects in automotive engineering, or a related field.
2. Use state-of-the-art modelling, CAD, CAM and CAE software packages to design, analyse and manufacture components and assemblies
3. Apply various engineering tools for analytical, finite element, numerical and dynamic analysis of the designed components and assemblies
4. Build and test physical automotive-related assemblies that use mechanical and electronic components
5. Perform critical thinking and problem solving approaches for technical problems
6. Write a technical report and present analytical and experimental results in a professional form

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:

- 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.

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.