

## Course Outline

1. COURSE INFORMATION			
<b>Session Offered</b>	Winter 2017		
<b>Course Name</b>	Capstone Design I		
<b>Course Code</b>	AUTO TECH 4TR1		
<b>Date(s) and Time(s) of lectures</b>	C01: Wednesday 2:30 pm – 5:20 pm C02: Friday 8:30 am – 11:20 am C03: Friday 1:30 pm – 4:20 pm January 4 – April 6, 2017		
<b>Program Name</b>	Automotive and Vehicle Technology		
<b>Calendar Description</b>	This course requires students to research, design, develop, and implement an independent project and continues as a Capstone Design II. The project plan and a model developed will be documented as a technical report and presented in a seminar.		
<b>Instructor(s)</b>	C01: Dr. Dan Centea C02: Dr. Timber Yuen C03: Dr. Lucian Balan	Office: MARC 272, ETB 513 Office: MARC 270 Office: MARC 271 E-Mail: as indicated by instructor	
2. COURSE SPECIFICS			
<b>Course Description</b>	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.		
<b>Instruction Type</b>	<b>Code</b>	<b>Type</b>	<b>Hours per term</b>
	C	Classroom instruction	
	L	Laboratory, workshop or fieldwork	36
	T	Tutorial	
	DE	Distance education	
	<b>Total Hours</b>		36
<b>Resources</b>	<b>ISBN</b>	<b>Textbook Title &amp; Edition</b>	<b>Author &amp; Publisher</b>
	<b>ISBN:</b>		
	<b>Other Supplies</b>	<b>Source</b>	
<b>Prerequisite(s)</b>	<a href="#">AUTOTECH 3AV3</a> , <a href="#">3MV3</a> , <a href="#">3VD3</a> , <a href="#">GEN TECH 3MT3</a> , and registration in level IV of the Automotive and Vehicle Technology program.		
<b>Corequisite(s)</b>	N/A		
<b>Antirequisite(s)</b>	N/A		

<p><b>Course Specific Policies</b></p>	<p>The instructor has the right to decline project proposals that are not clearly defined and recommend other projects.</p> <p>Each week during the class hours, each student will report to the instructor the progress of the project.</p> <p>Each student will individually keep track of the work performed outside and inside the lab/classroom. A log book will be updated and presented to the instructor every week, and it will be used to assess the amount of work done outside the class room environment and will be reflected in the marks awarded for this category. Each logbook entry will include an updated Gantt chart produced with project management software.</p> <p>A Bill Of Material (BOM) is required for approval before material is purchased.</p> <p>Project parts to be 3D printed must be first verified and approved by the course instructor. The use of CNC and other manufacturing lab equipment may require prior booking.</p> <p>The departmental Safety Policy must be followed by the students working in the lab.</p> <p>Each group will submit a Final Report* at the end of the semester. The evaluation of this report will be based on: a) project plan and its implementation, technical content, depth and comprehension, originality, working model demonstration, and problem solving skills; b) background, report structure and format, written communication skills; and c) literature references (internet, text and reference books, reports, original journals). The report will be submitted as a digital copy, along with an updated log book.</p> <p>After grading, the submitted reports become the property of the department and will not be returned to the students. The students are allowed to view their reports after grading upon request.</p> <p>Each student will present their project to the class. The evaluation will be based on the project concept, its viability, technical depth, and results.</p> <p>Quizzes will be used to assess each student's understanding of the engineering design process and other material assigned.</p>
<p><b>Departmental Policies</b></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.</p> <p>Instructor has the right to submit work to software to identify plagiarism.</p>

<b>3. SUB TOPIC(S)</b>		
Week 1	Introduction , project topics, lab introductions	Jan 4 – 6
Week 2	Project and time management, project selection, team formed by the end of the week	Jan 11 – 13
Week 3	Literature search, preliminary project proposal	Jan 18 – 20
Week 4	One-to-one meetings and discussions	Jan 25 – 27
Week 5	Quiz #1, one-to-one meetings and discussions	Feb 1 – 3
Week 6	One-to-one meetings and discussions	Feb 8 - 10
Week 7	Project work	Feb 15 – 17
Mid-term Recess: Monday, February 20 to Sunday, February 26, 2017		
Week 8	Midterm report, project work	March 1 – 3
Week 9	Project work	March 8 – 10
Week 10	Quiz #2 and project work	March 15 – 17
Week 11	Poster and project work	March 22 -24
Week 12	Final project report and poster submission (March 27) Projects presentation	March 27 – 31
Classes end – Thursday, April 6 2017 Final examination period: Tuesday, April 11 2017 to Thursday, April 27 2017 All examinations MUST BE written during the scheduled examination period.		
<p>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.</p>		
<b>4. ASSESSMENT OF LEARNING *including dates*</b>		<b>Weight</b>
Logbook records and meeting participation (weekly – individual)		10%
Quizzes (week 5 and week 10 – individual)		10%
Midterm report (week 8 – group)		15%
Poster (week 12 – group)		10%
Final report (week 12 – group)		45%
Final presentation (week 12 – individual)		10%
<b>TOTAL</b>		<b>100%</b>
Percentage grades will be converted to letter grades and grade points per the University calendar.		
<b>5. LEARNING OUTCOMES</b>		
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.		
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. POLICIES

### 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](http://www.mcmaster.ca/policy/General/HR/Discrimination_Harassment_Sexual_Harassment-Prevention&Response.pdf)

### Academic Integrity

You are required 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.

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.

It is your responsibility to understand what constitutes academic dishonesty. For information on the various kinds of academic dishonesty please refer to the Academic Integrity Policy, located at: <http://www.mcmaster.ca/policy/Students-AcademicStudies/AcademicIntegrity.pdf>.

The following illustrates only three forms of academic dishonesty:

1. Plagiarism. E.g. the submission of work that is not own or for which other credit has been obtained
2. Improper collaboration in group work
3. Copying or using unauthorized aids in tests and examinations.

### Requests for Relief for Missed Academic Term Work (Assignments, Mid-Terms, etc.)

The McMaster Student Absence Form is an on-line self-reporting tool for **Undergraduate Students** to report absences for:

- 1) Relief for missed academic work worth less than 25% of the final grade resulting from medical or personal situations lasting up to three calendar days:
  - Students may submit a maximum of one academic work missed request per term. It is the responsibility of the student to follow up with instructors immediately (within the 3 day period that is specified in the MSAF) regarding the nature of the accommodation. All work due in that time period however can be covered by one MSAF.
  - MSAF cannot be used to meet religious obligation or celebration of an important religious holiday, for that has already been completed or attempted or to apply for relief for any final examination or its equivalent.
- 2) For medical or personal situations lasting more than three calendar days, and/or for missed academic work worth 25% or more of the final grade, and/or for any request for relief in a term where the MSAF has not been used previously in that term:

Students must visit their Associate Dean's Office (Faculty Office) and provide supporting documentation. <http://www.mcmaster.ca/msaf/>

### E-Learning Policy

Consistent with the Bachelor of Technology's policy to utilize e-learning as a complement to traditional classroom instruction, students are expected to obtain appropriate passwords and accounts to access Avenue To Learn for this course. Materials will be posted by class for student download. It is expected that students will avail themselves of these materials prior to class. Students should be aware that, when they access the electronic components of this course, private information such as first and last names, user names for the McMaster e-mail account, and program affiliation may become apparent to all other students in the course. The available information is dependent on the technology used. Continuation in this course will be deemed consent to this disclosure. If you have any questions or concerns about this disclosure please discuss this with the course instructor. Avenue can be accessed via

<http://avenue.mcmaster.ca>.

## 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.

## Turnitin (Optional)

This course will be using a web-based service (Turnitin.com) to reveal plagiarism. Students submit their assignment/work electronically to Turnitin.com where it is checked against the internet, published works and Turnitin's database for similar or identical work. If Turnitin finds similar or identical work that has not been properly cited, a report is sent to the instructor showing the student's work and the original source. The instructor reviews what Turnitin has found and then determines if he/she thinks there is a problem with the work. Students who do not wish to submit their work to Turnitin.com must still submit a copy to the instructor. No penalty will be assigned to a student who does not submit work to Turnitin.com. All submitted work is subject to normal verification that standards of academic integrity have been upheld (e.g., on-line search, etc.). To see the Turnitin.com Policy, please go to

<http://www.mcmaster.ca/academicintegrity/turnitin/students/>

## Protection of Privacy Act (FIPPA)

The Freedom of Information and Protection of Privacy Act (FIPPA) applies to universities. Instructors should take care to protect student names, student numbers, grades and all other personal information at all times. For example, the submission and return of assignments and posting of grades must be done in a manner that ensures confidentiality.

<http://www.mcmaster.ca/univsec/fippa/fippa.cfm>

## Academic Accommodation of Students with Disabilities Policy

Students who require academic accommodation must contact Student Accessibility Services (SAS) to make arrangements with a Program Coordinator. Academic accommodations must be arranged for each term of study. Student Accessibility Services can be contacted by phone 905-525-9140 ext. 28652 or e-mail [sas@mcmaster.ca](mailto:sas@mcmaster.ca). For further information consult McMaster's policy for Academic Accommodation of Students with Disabilities [http://www.mcmaster.ca/policy/Students-](http://www.mcmaster.ca/policy/Students-AcademicStudies/AcademicAccommodation-StudentsWithDisabilities.pdf)

[AcademicStudies/AcademicAccommodation-StudentsWithDisabilities.pdf](http://www.mcmaster.ca/policy/Students-AcademicStudies/AcademicAccommodation-StudentsWithDisabilities.pdf)

Students must forward a copy of the SAS accommodation to the instructor of each course and to the Program Administrator of the B.Tech. Program immediately upon receipt. If a student with a disability chooses NOT to take advantage of a SAS accommodation and chooses to sit for a regular exam, a petition for relief may not be filed after the examination is complete. <http://sas.mcmaster.ca>

## Student Code of Conduct

The Student Code of Conduct (SCC) exists to promote the safety and security of all the students in the McMaster community and to encourage respect for others, their property and the laws of the land. McMaster University is a community which values mutual respect for the rights, responsibilities, dignity and well-being of others. The purpose of the Student Code of Conduct is to outline accepted standards of behavior that are harmonious with the goals and the well-being of the University community, and to define the procedures to be followed when students fail to meet the accepted standards of behavior. All students have the responsibility to familiarize themselves with the University regulations and the conduct expected of them while studying at McMaster University.

<http://judicialaffairs.mcmaster.ca/pdf/SCC.pdf>

<http://www.mcmaster.ca/policy/Students-AcademicStudies/StudentCode.pdf>