



### Important Notes:

- If your total score before the final exam is less than 40% and you decide to defer the final exam, you will receive an **R** grade which prevents you to defer the final exam
  - In order to pass the class, both your cumulative score and the final examination must be **above 50%**
  - In the event of extraordinary circumstances beyond the University's control, the content and/or evaluation scheme in this course is subject to change.
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**WeBWorK:** Every student will be given access to an online system called WeBWorK. Students are expected to submit assignments online using WeBWorK. Late assignments will not be accepted. Assignments contribute 10% to your final grade. Working regularly on the assignments is essential for success in this course. Students are also strongly encouraged to do as many problems as their time permits from the chapters of the textbooks listed below in this outline.

- The **WeBWorK administrator** is Siavash Hedayati Nasab email: siavash.h.n@gmail.com, any questions related to WeBWorK assignments should be directed to him.
  - **Students are also responsible for topics covered in assignments that have not been presented in either the regular lectures or during tutorials.**
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### General rules:

- If the student misses one mid-term test for a reason, acceptable by the course coordinator, including illness\*, then the final examination will count for 70% of the total grade. **Students cannot miss both midterms.**
- Since there is a 5% team projects bonus allocation, there will be no replacements of quizzes for any reason, including illness.
- Students are responsible for finding out the date of the final exam. The Examination Office posts the time and place of the final exam once the schedule becomes available. Any conflicts or problems with the scheduling of the final exam must be reported directly to the Examination Office. Students are expected to be available until the end of the final examination period. Conflicts due to travel plans will not be accommodated.

**NOTE: Electronic communication devices** (including cellphones) **will not be allowed** during examinations and are prohibited in the examination rooms. Only "Faculty Approved Calculators" will be allowed for midterm and final exams [SHARP EL-531 or CASIO FX-300MS].

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### GRADUATE ATTRIBUTES

ENGR233 emphasizes and develops the CEAB (Canadian Engineering Accreditation Board) graduate attributes and indicators: Knowledge base for engineering -Problem Analysis (Problem identification, Modeling, Problem solving) -Life-long Learning.

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### COURSE LEARNING Outcomes (CLOs)

Upon successful completion of ENGR233, the students will be able to:

- Apply multivariable calculus to engineering problems. Extract all the pertinent information *vis-à-vis* the physics and practicality of the problem. This component is examined through an applied problem in the final exam.
  - Learn how to work within a team. This is done through one or two Team Projects.
  - Acquire new knowledge by self-study. This is accomplished by making students responsible for certain material on assignments and exams, without that material being lectured on.
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### Tutors and Markers Info:

**Tutor Sec SA:** Saikat Bagchi (er.saikat.ac@gmail.com) on Mondays 8h20–10h00, Room: FB S113 SGW

**Tutor Sec SB:** Theodore Potsis (theodore.potsis@concordia.ca) on Wednesdays 13h15–14h55, Room: FG B040 SGW

**Tutor Sec SC:** Name; E-mail – TBA; on Mondays 8h20 – 10h00, Room: MB 3.445 SGW

**Markers:** Names; E-mails - TBA

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## Schedule, topics, and recommended problems:

**Week 1 (Jan 10<sup>2</sup>):** Review of the following topics:

- 7.1 Vectors in 2-space problems: 1, 21, 30, 41, 50
- 7.2 Vectors in 3-space: 11, 24, 32, 34, 52
- 7.3 Dot product: 12, 15, 23, 29, 31, 41, 48
- 7.4 Cross product: 3, 13, 22, 28, 41, 42, 45, 49, 52

**Week 2 (Jan 17):** 7.5 Lines and planes in space: 5, 12, 17, 24, 33, 36, 39, 49, 57, 61, 66, 75  
9.1 Vector functions: 1, 4, 10, 18, 25, 34, 36, 39, 42, 45

**Week 3 (Jan 24):** 9.2 Motion on a curve: 4, 9, 11, 13, 14, 19, 22, 27, 28, 29  
9.3 Curvature. Components of Acceleration: 1, 6, 9, 16, 17, 20, 23

**Week 4 (Jan 31)** 9.4 Partial derivatives: 2, 3, 6, 9, 15, 21, 24, 26, 27, 36, 39, 42, 48, 49, 51, 55, 56, 57  
9.5 Directional derivative: 3, 6, 12, 14, 15, 18, 24, 27, 28, 33, 41, 43, 44

**Week 5 (Feb 07):** 9.6 Tangent planes and normal lines: 3, 4, 14, 15, 25, 34, 39  
9.7 Curl and Divergence: 7, 11, 15, 21, 24, 27, 30, 39, 40, 43, 44

**Week 6 (Feb 14):** 9.8 Line integrals (end): 3, 6, 9, 15, 21, 25, 27, 28, 30, 33, 36, 40  
9.9 Independence of path: 3, 6, 15, 18, 21, 24, 26, 27, 28, 30

**Week 7 (Feb 21):** 9.10 Double integrals: 3, 5, 9, 15, 18, 21, 24, 27, 33, 36, 39, 42, 45, 52, 62, 65, 68

**Week 7/8: Midterm 1 (during tutorials):**

**Sections SA, SC: 9h00 to 10h00, Monday, February 28**

**Section SB: 13h55 to 14h55, Wednesday, March 2**

**on material Chap 7 + Sections 9.1 through 9.7**

**Week 8 (Feb 28):** 9.11 Double integral in polar coordinates: 3, 6, 11, 12, 19, 24, 27, 29, 30, 33, 34  
9.12 Green's theorem: 3, 4, 6, 8, 12, 18, 19, 23, 24, 25, 27, 33

**Week 9 (Mar 07):** 9.13 Surface Integrals: 2, 4, 6, 8, 10, 11, 15, 17, 18, 24, 28, 29, 32, 33, 36, 37, 39

**Week 10 (Mar 14):** 9.14 Stokes theorem: 3, 4, 6, 9, 10, 12, 13, 14, 18

**Week 10/11: Midterm 2 (during tutorials):**

**Sections SA, SC: 9h00 to 10h00, Monday, March 21**

**Section UB: 13h55 to 14h55, Wednesday, March 23**

**on material of Section 9.8 through Section 9.13**

**Week 11 (Mar 21):** 9.15 Triple Integrals: 3, 6, 9, 13, 14, 15, 21, 23, 24, 27, 32, 34, 45, 48,

**Week 12 (Mar 28):** 9.15 Triple Integrals: 51, 54, 57, 68, 69, 72, 75, 76, 78, 81  
9.16 Divergence theorem: 2, 3, 6, 9, 11, 12, 13, 15, 17, 21, 22

**Week 13 (Apr 04):** 9.17 Change of variables in multiple integral: 3, 5, 7, 8, 9, 10, 13, 15, 17, 22, 23, 25, 27

**Time permitted :** Review: 1-20, 24, 26, 29, 30, 32, 36, 38, 43, 46, 50, 51, 53, 54, 56, 57, 58, 60, 63, 65

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**Extraordinary circumstances:** In the event of extraordinary circumstances and pursuant to the Academic Regulations, the University may modify the delivery, content, structure, forum, location and/or evaluation scheme. In the event of such extraordinary circumstances, students will be informed of the changes.

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<sup>2</sup> The dates refer to the Monday of each week; regardless of the days of the class or tutorials