
Important course information

Instructor: Mark Girard
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Office Hours: 9:00–10:00 on Mondays and 12:00–13:00 Wednesdays (or by appointment).

Website: https://learn.uwaterloo.ca

TA: Zhibing Sun (zhibing (dot) sun (at) uwaterloo (dot) ca)

Lectures/Tutorial: See the schedule on the next page.
Lectures: Tues/Wed/Thurs 15:30–16:20 in E7 4417
Tutorial: Wed 17:30–18:20 in E7 4433

Additional **makeup lectures** are scheduled Thurs 12:30-13:20 in E7 4417 for the following dates:

Sep 12, Sep 26, Oct 10, Oct 31, Nov 14, Nov 28.

Recommended readings: Lecture notes will be posted on the course Learn page. Additional sugested readings from the suggested textbook will also be given: *Advanced Engineering Mathematics* by Michael Greenberg (second edition).

Homework/Problem sets: A new problem set will be posted each week on the course webpage. Although these will not be graded, you are stongly encouraged to work through all of the problem sets. The quiz questions will be closely based on these problems.

Quizzes/Tutorials: Most weeks during the tutorial there will be a quiz covering the previous week's (or two weeks') material. See the course schedule on the following page. During weeks with no scheduled quiz, tutorials will give an opportunity to ask questions related to course material. (Your lowest quiz score will be dropped at the end of the term.)

Midterm: Thursday October 24, 16:45-19:00 in E7-4417.

Final grade: The final grade will be calculated using the following scheme: Final exam 50%, Midterm 30%, Quizzes 20% (your lowest quiz score will be dropped).

Course Schedule

Week	**Lectures (Tues, Wed, Thurs)**	**Tutorial** (Wed)
1	September 4 and 5	(no tutorial)
2	September 10, 11, and 12 (+makeup)	
3	September 17, 18, and 19	Quiz 1
4	September 24, 25, and 26 (+makeup)	Quiz 2 (in class (15:30) on Sep 26)
5	October 1, 2 and 3	No quiz
6	October 8, 9, and 10 (+makeup)	Quiz 3 (Oct 9)
-	No lectures (reading week)	No tutorial
7	No lectures (midterm week)	No tutorial
8	October 29, 30, and 31 (+makeup)	Quiz 4 (in class (15:30) on Oct 31)
9	November 5, 6, and 7	Quiz 5 (Nov 6)
10	November 12, 13, and 14 (+makeup)	Quiz 6 (Nov 13)
11	November 19, 20, and 21	
12	November 26, 27, and 28 (+makeup)	Quiz 7 (Nov 27)
13	December 3	(no tutorial)

Policies

Missed exam policy: Supporting documentation (i.e. verification of illness form) must be provided for any missed exam. Absence for the midterm will result in the weight being shifted to the final exam. Absence for the final exam may result in a grade of INC at the discretion of the instructor. To be considered for an INC, you must have a passing grade up to that point.

Academic Integrity: In order to maintain a culture of academic integrity, members of the University of Waterloo community are expected to promote honesty, trust, fairness, respect and responsibility. [Check www.uwaterloo.ca/academicintegrity/ for more information.]

Grievance: A student who believes that a decision affecting some aspect of his/her university life has been unfair or unreasonable may have grounds for initiating a grievance. Read http://www.adm.uwaterloo.ca/infosec/Policies/policy70.htm (Section 4) for details. When in doubt please be certain to contact the department's administrative assistant who will provide further assistance.

Discipline: A student is expected to know what constitutes academic integrity to avoid committing academic offenses and to take responsibility for his/her actions. A student who is unsure whether an action constitutes an offense, or who needs help in learning how to avoid offenses (e.g., plagiarism, cheating) or about "rules" for group work/collaboration should seek guidance from the course professor, academic advisor, or the undergraduate associate dean. For information on categories of offenses and types of penalties, students should refer to Policy 71 – Student Discipline. For typical penalties check Guidelines for the Assessment of Penalties.

Appeals: A decision made or penalty imposed under Policy 70, Student Petitions and Grievances (other than a petition) or Policy 71, Student Discipline may be appealed if there is a ground. A student who believes he/she has a ground for an appeal should refer to Policy 72 – Student Appeals.

Note for Students with Disabilities: AccessAbility Services, located in the new addition to Needles Hall, Room 1401, collaborates with all academic departments to arrange appropriate accommodations for students with disabilities without compromising the academic integrity of the curriculum. If you require academic accommodations to lessen the impact of your disability, please register with the office at the beginning of each academic term.

Topics

Part 1 – Vector Calculus

- Paths and curves
- Scalar fields and vector fields; gradient vector
- Line integrals of scalar functions and vector fields; fundamental theorem for line integrals; Green's Theorem
- Multiple integrals (area, volume)
- Change of coordinates (polar, cylindrical, spherical coordinates)
- Parameterization of surfaces
- Surface integrals of scalar functions and vector fields; flux
- Divergence and curl; Divergence Theorem, Stokes' Theorem
- Application: Maxwell's equations

Part 2 – Complex Analysis

- Review of complex numbers (Cartesian/polar forms, nth roots)
- Complex functions; mappings
- Complex differentiation (holomorphic functions, Cauchy-Riemann equations)
- Integration (path integrals, Cauchy's Theorem, Cauchy's Integral formulas)
- Power series and residues (Taylor/Laurent series, singularities, the Residue Theorem)
- Conformal maps; applications to potential theory