ECE 205 – Advanced Calculus for Electrical and Computer Engineers

Instructor: Michael Brannan
Office: MC 5447 (Department of Pure Mathematics)
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Course Website: https://learn.uwaterloo.ca/

Lecture Location: All lectures take place in E7 4043.

Lecture Times:

- **Lecture Section 001**: TTh 8:30AM - 9:20AM, F 9:30AM - 10:20AM every week, and W 10:30AM - 11:20AM only on January 24, February 7, March 6, March 20, April 3.
- **Lecture Section 002**: T 1:30PM - 2:20PM, Th 3:30PM - 4:20PM, F 2:30PM - 3:20PM and W 3:30PM - 4:20PM only on January 24, February 7, March 6, March 20, April 3.

Instructor Office Hours: Tuesdays 9:30AM-11:00AM in MC 5447.

Tutorial Times and Locations:

- **Tutorial Section 101**: M 3:30PM - 4:20PM in E7 4053.
- **Tutorial Section 102**: M 9:30AM - 10:20AM in E7 4417.

Course TAs:
Brayden Hull, b2hull@uwaterloo.ca
Brittany Howell, b6howell@uwaterloo.ca
Andrew Gray, acdgray@uwaterloo.ca
Haocheng Chang, h48chang@uwaterloo.ca
Yazdan Babazadeh Maghsoodlo, ybabazad@uwaterloo.ca

TA Office Hours: TBA – These will be posted in Learn.

Course Description and Objectives: This courses introduces students to some simple types of ordinary differential equations. In addition to classical methods of solving them, Laplace transforms will be introduced as an alternative method of solving differential equations. The Fourier series representation of periodic functions will be detailed, and Fourier transforms will be introduced. Partial differential equations and the method of separation of variables to solve certain kinds of PDEs will be described; in particular the wave and heat equations will be studied.

Assessment Scheme		
	Homework (best 8 out of 10)	40 %
	Midterm Exam	20 %
	Final Exam	40 %

Recommended Textbooks and Resources: Prof. Eduardo Martin-Martinez has some great notes which can be found here: https://sites.google.com/site/emmfis/teaching/math-211-ece-205. In addition you may find the following (not required) text useful for additional notes and exercises:

(1) 1. Advanced Engineering Mathematics, Michael D. Greenberg (2nd Edition).

Assignments: There will be ten assignments distributed roughly equally through the term. The best eight of these will contribute to your final grade. Assignment are to be submitted on Crowdmark and will be due on the dates below at 5 pm. Late assignments will receive a grade of 0; exceptions will only be made in the case of unavoidable circumstances. Collaboration on assignments is allowed, even recommended; however, straight-up copying will not be accepted and the

final submission must be in your own words. Any help from your peers or external sources must be appropriately cited. You have at least 5 business days to complete each assignment.

Assignment Due Dates:		
	Assignment 1	January 17
	Assignment 2	January 24
	Assignment 3	January 31
	Assignment 4	February 7
	Assignment 5	February 14
	Assignment 6	March 6
	Assignment 7	March 13
	Assignment 8	March 20
	Assignment 9	March 27
	Assignment 10	April 3

Tutorials: The weekly tutorials will be run by the course TAs, and they will provide an opportunity for students to work through practice problems and ask questions about the assignments.

Midterm Exam: The midterm exam will be held on 5:00PM - 6:15PM on Friday March 1 in E7 4043, 4053, 4417, 4433.

Final Exam: The final exam will take place in-person and is to be scheduled by the registrar. Do not miss the exam unless it is a medical emergency. Documentation is required and could consist of a self-declaration of illness:
`https://uwaterloo.ca/quest/help/students/how-do-i/self-declare-my-illness`

Missed final exam: An incomplete is only an option if there is a legitimate reason for missing the exam (generally a medical emergency) *and* the term work has been satisfactory.

Missed lectures: Students are expected to attend every lecture. If a lecture is missed due to an illness, or for purposes of self-isolation due to COVID-19 exposure, lecture notes will be made available to the student upon request.

Crowdmark: You sign in to Crowdmark using Learn. Crowdmark is a system for uploading questions online so that graders have easy access to your solutions, and you have easy access to their comments. Each question should be scanned or photographed separately, and uploaded into the appropriate section for that question. Students experience serious time delays when they attempt to do this close to deadline, resulting in late work. I recommend uploading each question once you think it is complete. If you change something, you can delete and add a new solution as long as you have not submitted. Be sure to save after each change. For more information, see:

https://crowdmark.com/help/categories/support-for-students/

Note: When uploading to crowdmark, you can delete and resubmit solutions to questions as many times as you like. However, once the deadline has passed, you can only upload your solution once.

The University Senate mandates that every course outline must contain the following text.

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 *Policy 70, Student Petitions and Grievances, Section 4*,

http://www.adm.uwaterloo.ca/infosec/Policies/policy70.htm.

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*,

http://www.adm.uwaterloo.ca/infosec/Policies/policy71.htm.

For typical penalties check *Guidelines for the Assessment of Penalties*,

http://www.adm.uwaterloo.ca/infosec/guidelines/penaltyguidelines.htm.

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 grounds for an appeal should refer to *Policy 72, Student Appeals*,

http://www.adm.uwaterloo.ca/infosec/Policies/policy72.htm.

Students with disabilities: The *Office for Persons with Disabilities* (OPD), located in Needles Hall, Room 1132, 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 OPD at the beginning of each academic term.