Multivariable Calculus for Engineering or Physics

Carleton University, Mathematics 2004

Updated December 2, 2020.

TEXTBOOK: **The ABC's of Calculus, Volume 2**, by Angelo Mingarelli, Nolan Company, July 2019 edition will be available in the Carleton University Bookstore at

www.carleton.ca/bookstore 613-520-3832

thebookstore@carleton.ca

in either digital or softcover format. Please contact the bookstore for orders and pricing.

Solutions Manual to go with the above text can be found here: https://people.math.carleton.ca/~angelo/calculus/ABC2-Solutions-Nov-15-2020.pdf

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Email: angelo.mingarelli@carleton.ca

Office Hours: N/A

Classes Fall 2020: N/A

Classes start: January 11, 2021

This site can be used by all students (except for Term Test dates) registered in MATH 2004 during the Fall Term regardless of section.

PREREQUISITES:

The prerequisites for this course are: 69.1005 or 2007, *and* 69.1104 or 1107. Students who have not passed the prerequisite courses may be automatically de-registered during the term. Those that have done poorly in the prerequisites are strongly urged to take 69.1005 before attempting this course. Do get advice from the instructor or from the Mathematics Undergraduate Advisor, Gary Bazdell in Math. **Optional:** In case you forgot your methods of integration, or inverse functions, or just about everything else over the summer, see my ABC-s of Calculus book currently used in 69.1004.

TWITTER @amingarelli Tweet

YOUTUBE: myawesomemathprof Channel - created by some of your past ENG classmates, during the 2011-2012 academic year.

The Calendar Year, 2020-2021: https://carleton.ca/registrar/registration/dates-and-deadlines/

Tell us what you think about our teaching at Rate My Professors.com

Calculators: This is the year of the great pandemic, so all classes will be online and pretty much anything is permitted.

Tutorials

N/A this term

(Locations TBA)

FAQ on Tutorials

Where do I go? Normally your section is given to you at registration time. Otherwise, this depends on your section letter and/or on the first letter of your family name; see the preceding paragraph for details about which room you'll go to.

Do I HAVE to go? Well, if you want to pass those tests and get your attendance to count on your behalf, then, YES, do go. If all you want to do is write the final exam, then that's OK, too; see the EVALUATION item above.

Who is my T.A.? Go the required class and ask him/her. There are too many changes for us to confirm TA's during the first few weeks of classes.

Private tutors: zitateaching@gmail.com, super.sam@hotmail.com (Please contact them directly.)

Detailed Class Outline

In the following table 1 week represents 2 lectures @1.5 hours, and NOT a full week, as usual.

WEEK	HOMEWORK	TESTS	SECTIONS	TOPICS
			1.1-1.10	Vectors: Dot Product, Cross Product, Triple Product; Direction Cosines; Lines and Planes
1	Suggested Homework Problems from Exercise Set 1 through Set 9		2.1-2.5, 2.6	Rotations of axes and translations in the plane.
			2.7-2.8	Planar curves and their parametric representations; Conic sections; Sketching parametric curves.
2	Suggested Homework Problems from Exercise Set 10 through Set 18		2.9-2.10	Applications to Area and Length of curves;
			2.11-2.14	Polar coordinates, Curve sketching in polar coordinates, Applications
3	Suggested Homework Problems from Exercise Set 19 through Set 25 (Skip Set 26)		3.1-3.3	Limits; Continuity; Partial Derivatives (Read over 3.4, p. 184 on Differentiability for completeness.)
4	Suggested Homework Problems from Exercise Set 27, Set 29, Set 30 (Skip Set 28)		3.5 - 3.5.1 3.6	Directional derivatives; Gradients (Read over MVT in 3.5.2, p. 199 for completeness) The Chain Rule, Implicit differentiation, Tangent planes and normal lines
5	Suggested Homework Problems from Exercise Set 31 through 36		3.8 4.1-4.3	Conservative fields, Divergence, and Curl. Line Integrals

	Suggested Homework	5.1-5.2.2	Double Integral, Iterated integrals
6	Problems from Exercise Set 37 through 39	5.3	Applications to Volume under a surface,
7	October 16 to 30		**Fall Break, no classes**
	Exercise Set 40	5.4	Change of variables in double integrals
8	Suggested Homework Problems from Exercise Set 41	5.5	Three dimensional plots
	Suggested Homework	5.6	Parametric equations of a surface
9	Problems from Exercise Sets 42 and 43	6.1-2	Surface integrals and some applications
	Suggested Homework	6.3	Green's Theorem
10	Problems from Exercise Set 44 and 45	6.4	Stokes' Theorem
	Suggested Homework Problems from Exercise Set 46	6.5-6.6	Triple integrals; Change of variables in triple integrals
11	Suggested Homework Problems from Exercise Set 47	6.7	Describing solids in cylindrical and spherical coordinates
12	Suggested Homework Problems from Exercise Set 48	6.8	The Divergence Theorem
13	Suggested Homework Problems from Exercise Sets 30 and 32	7.2-3	Maxima and minima of functions of two variables, Lagrange multipliers

EVALUATION

Your final grade will be calculated as:

Tutorial attendance: expected but not graded.

2 online tests of 120 minutes at a time TBA by your individual instructors: 15%+15%

3 assignments 3 x 15 = 45%

Final: 25%

Missed tests and assignments will be dealt with at a unique predetermined time before the end of term. Ask your instructor for more details.

Students with disabilities requiring academic accommodations in this course are encouraged to contact the Paul Menton Center for Students with Disabilities (500 University Center) to complete the necessary forms. After registering with the Center, make an appointment to meet with me in order to discuss your needs at least two weeks before the first in-class test. This will allow for sufficient time to process your request. Please note the following deadlines for submitting completed forms to the PMC for formally scheduled exam accommodations: TBA for fall and fall/winter term courses, and TBA for winter term courses."

TUTORIAL CENTRE: N/A

Course Sharing Websites

"Classroom teaching and learning activities, including lectures, discussions, presentations, etc., by