American University of Beirut - Faculty of Arts and Sciences
Department of Mathematics
Math 201: Calculus III
Fall 2018

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Office hours: 14:00-15:30 MF and by appointment
Class meetings: 11:00-11:50 MWF, Nicely Hall 415, Aug 30 – Dec 20, 2018
Recitations: Section 9: 15:00 F, Nicely Hall 108
Section 10: 16:00 F, Nicely Hall 412
Section 11: 17:00 F, Nicely Hall 412

Text
Thomas' Calculus, 13th edition by Thomas, Weir, and Hass

Catalogue course description
Sequences and series, multivariable functions, partial derivatives, cylindrical and spherical coordinates, multiple integrals, and integration in vector fields.

Course learning outcomes
At the end of the course, students will be able to:

• Define the sum of a series as a limit of a sequence

• Use tests to decide about the convergence of a series

• Use series to approximate functions

• Define differentiability for functions of several variables

• Find the derivative of a function in a given direction
• Maximize or minimize a function subject to a given constraint
• Define the integral of a function of several variables
• Use Fubini's theorem to evaluate double and triple integrals
• Apply double integrals (in cartesian & polar coordinates) to find areas & centers of "mass"

• Apply triple integrals (in cartesian, cylindrical and spherical coordinates) to find volumes & centers of mass

• Study substitutions in double & triple integrals.
• Line Integrals
• Green's Theorem (if time permits)

'AUB strives to make learning experiences as accessible as possible. If you anticipate or experience academic barriers due to a Disability (including mental health, chronic or temporary medical conditions), and in order to help establish reasonable accommodations and facilitate a smooth accommodations process, you are encouraged to contact the Accessible Education Office in West Hall 314'.

Title	Section	Assigned homework problems
Sequences	10.1	1, 5, 7, 10, 13, 16, 20, 21, 24, 28, 31, 32, 41-55, 65, 67, 78-82, 87, 88.
Infinite series	10.2	11,15,16,19, 23, 25, 28, 34, 36-40, 43, 44, 47- 68.
Integral test	10.3	6, 9, 10, 11, 16, 21, 22, 25- 28, 32-38, 43, 55, 56
Comparison tests	10.4	6-14,18, 25-32,34,42, 43,47, 56, 58, 60,63,65,67
Absolute convergence;		
Ratio and Root tests	10.5	8, 11, 18,14, 20, 22, 23, 25, 27-40.
Alternating series	10.6	8-10,14, 18, 21,22, 23, 26, 29,30,34, 36, 40, 43, 49-51.
Power series	10.7	4,8,10,14,18,20,22,25,29,31,33,34,36,39,41,42,53- 60.
Taylor series	10.8	3, 5, 11, 21, 23, 26, 29.
Error estimates	10.9	1, 5, 8-10,11-13,15, 18, 19, 20, 22, 23, 25, 28,35-50.
Binomial series	10.10	2, 3, 5, 12, 15-24, 53-55.

Exam 1 (25% of course grade) Saturday, September 29, 1:00 → 2:00 pm

Polar coordinates	11.3	1,3, 6,7, 9,11, 13, 15, 17, 19,21,23,25, 27, 28, 33-38, 63, 68
Graphing in polar coordinates	11.4	1, 3 ,5, 6, 21-24.
Cylinders and quadric surfaces	12.6	1-12
Functions of several variables	14.1	2, 6, 7, 8, 13-15, 22- 30.
Limits and continuity	14.2	3, 6, 17, 18, 27, 35, 36, 39, 41,44,46, 47,49 50,54- 58.
Partial derivatives	14.3	1, 7, 12, 17, 19, 21, 22, 25, 26, 30, 43, 49, 51,55.
The chain rule	14.4	1, 3, 4, 7, 8, 9, 25, 26, 27, 30, 31,32, 33, 35, 37.
Directional derivative	14.5	5, 7, 12, 16, 17, 20, 23, 26, 29, 31, 32,33.
Tangent planes	14.6	1, 3, 8, 9,12, 13, 17, 19-22.
Extreme values	14.7	1, 3, 7, 9, 12, 30, 31, 41, 49.

Exam 2 (25% of course grade) Saturday, November 3, 1:00 → 2:00 pm

Lagrange multipliers	14.8	1, 9, 11, 12, 17, 21, 23, 25,27.
Double integrals I	15.1	6, 7, 10, 11, 12, 15,16, 21, 22.
Double integrals II	15.2	9- 25, 33,35,37,39,41,43,45,47,49,51,83.
Area by double integration	15.3	1,3, 5, 7,9, 11,13,15,17, 19, 21.
Double integrals in polar	15.4	3,5,7,13,15,17,19,28,31,32,41.
Triple integrals	15.5	3, 5, 8, 9, 10, 13, 15, 17, 22, 25, 31, 33, 41, 43.
Moments and centers of mass	15.6	1,3, 5, 13.
Triple integrals in cylindrical and spherical	15.7	3, 5, 7, 9, 11,15, 17,21,23,27,29,31,34,37,43,50,61.
Substitutions in multiple integrals	15.8	1, 3, 5, 7,9, 13,18,19, 20,21,23,24.
Line integrals	16.1	1-9, 11, 13, 15, 16, 17, 19, 21,23,25,26-28.

Final Exam comprehensive (50 % of course grade) TBA