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A	**Course Title & Number**	**MTH 203 – CALCULUS III**
B	**Pre/Co-requisite(s)**	Prerequisite: MTH 104 (Calculus II)
C	**Number of credits**	3-1-3
D	**Faculty Name**	Ayman Badawi
E	**Term/ Year**	Spring 2021

F — Sections

Section Number	Course	Days	Time	Location
04	MTH203	MW	12:30-1:45pm	online
04	MTH203R	M	2:00-2:50 pm	online

∗ Location subject to change

G — Instructor's Information

Instructor	Office	Email
Ayman Badawi	NAB 262	abadawi@aus.edu

Office Hours: **My office hours are available upon request** (just email me abadawi@aus.edu ; if you need a different time than the below, also email me

Sunday	Monday	Tuesday	Wednesday	Thursday
3- 4:30pm (upon request)		3- 4:30pm (upon request)		

H — Course Description from Catalog

Covers calculus of functions of several variables, vectors and analytic geometry of three-dimensional space, partial derivatives, gradients, directional derivatives, maxima and minima, multiple integrals, line and surface integrals, Green's theorem, Divergence theorem and Stokes' theorem. Includes a computer laboratory component.

I — Course Learning Outcomes

Learning Outcomes	Assessment Instruments
1. Demonstrate the ability to analyze and visualize curves, surfaces, and regions in 2 and 3 dimensions and use vectors to study geometry in 3 space.	Quizzes, Exam 1, Final
2. Perform calculus operations on vector-valued functions including limits, derivatives, and integrals.	Quizzes, Exam 1, Final
Perform calculus operations on functions of several variables including limits, partial derivatives, and directional derivatives.	Quizzes, Exam 1, Final
3. Find extrema and tangent planes of functions of two variables.	Quizzes, Exam 2, Final
4. Evaluate multiple integrals in appropriate coordinate systems such as rectangular, polar, cylindrical and spherical coordinates and apply them to solve problems involving area, volume, and surface area. .	Quizzes, Exam 2, Final
5. Apply some of the theorems of vector calculus, such as the Fundamental Theorem of Line Integrals, Green's Theorem, the Divergence Theorem, and Stokes' Theorem, to simplify integration problems.	Quizzes, Final Exam

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		.
J	**Textbook and other Instructional Material and Resources**	**Primary:** Class notes, I-Learn: problems with solution on each section. My personal webpage for old quizzes, exams.: https://www.ayman-badawi.com/MTH%20203.html **(OPTIONAL)** Calculus Early Transcendental, 8th Edition, by James Stewart, 2016, CENGAGE Learning, International Metric Version. **Purchasing Options :** • Through The University Book Store • Through Cengage Website and use the below details : Website : https://login.cengagebrain.co.uk/cb/ **PRODUCT ISBN : 9781337771511** Discount Code : **895GENE25** **Video Link for Purchasing Steps: https://cengageo365-my.sharepoint.com/:v:/g/personal/ahmed_abdelsalam_cengage_com/EUoLMjzYxLFHhcWDHBVmqRoBTnWCK3WKCZEf5_gpWpZ9Xw?e=nWN4O1** **Supplemental:** The material in this course can be found in any standard Calculus textbook.
K	**Teaching and Learning Methodologies**	This course is designed to help the students: • Utilize three-dimensional geometry to model science/engineering problems. • Use functions of several variables, their partial derivatives and their integration to solve real life problems. • Grasp the main concepts and theorems of vector calculus and how they relate to science applications.
L	**Grading Scale, Grading Distribution, and Due Dates**	

Cut-off (%)	Grade Points		Cut-off (%)	Grade Points
93 ≤ A ≤ 100	4.0		73 ≤ C+ < 76.99	2.3
89 ≤ A- < 92.99	3.7		67 ≤ C < 72.99	2.0
85 ≤ B+ < 88.99	3.3		61 ≤ C- < 66.99	1.7
81 ≤ B < 84.99	3.0		45 ≤ D < 60.99	1.0
77 ≤ B- < 80.99	2.7		F < 44.99	0

Assessment	Weight	Due Date and Remarks
Quizzes	15%	TBA
Recitation	5%	Attendance activities in the recitation
Test I	25%	6:00-7:30 pm, Sunday, March 21, 2021
Test II	25%	8:00 -9:30 pm, Sunday, May 9, 2021
Final Exam	30%	As given by the registrar's office
Total	100%	

Warning:2. If you are flagged during the exam, you will be called for a meeting to discuss your exam paper. Based on the outcome of the discussion, an appropriate decision will be taken.

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M	**Explanation of Assessments, Remarks, Rules and Regulations**	**Exams and Quizzes: There will be 2 exams, a final exam and a number of quizzes. Only one quiz will be dropped**. There will be no make-up quizzes under any circumstances. **Laboratory component/Recitation:** This course has 1 hour per week laboratory component. This hour will be used in the following variety of ways: to solve problems/examples, Quizzes, or additional lecture **Help:** Students are encouraged to consult their instructor during his office hours or by appointment. **Remarks, Rules and Regulations:** Attendance Policy - Students in this course are required to follow the AUS Attendance Policy as outlined in the AUS Undergraduate Catalog 2020-2021. • **Material Sharing During Exams & Quizzes**: Students are not allowed to share calculators or any other material during exams and quizzes. • **Make-up exams/quizzes:** If a student fails to attend a midterm exam, then there will be no make-up exam for it. In certain cases, the instructor may give a missed assessment the average of the other elements in that component. • **Incomplete Grades:** Failing to show up in time for the final exam will result in a zero in that exam. Only in exceptional cases of compelling medical or other emergencies certified by a medical or other professional. • **Final Grades:** All students are treated equally. Tests and other graded assignments due dates are set. No addendum, make-up exams, or extra assignments to improve grades will be given.
N	**Student Academic Integrity Code Statement**	Student must adhere to the Academic Integrity code stated in the 2020-2021 undergraduate catalog and to the Fall 2020 FAQ's from the following link: https://www.aus.edu/about/aus-response-to-the-coronavirus-disease-covid-19

Tentative Weekly Schedule

Week	CHAPTER	NOTES
1	12.1 Three-Dimensional Coordinate Systems 12.2 Vectors 12.3 The Dot Product	
2	12.4 The Cross Product 12.5 Equations of Lines and Planes 12.6 Cylinders and Quadric Surfaces	
3	13.1 Vector Functions and Space Curves 13.2 Derivatives and Integrals of Vector Functions 13.3 Arc Length (curvature will not be examined)	
4	13.4 Motion in Space: Velocity and Acceleration 14.1 Functions of Several Variables 14.2 Limits and Continuity	
5	14.3 Partial Derivatives 14.4 Tangent Planes and Linear Approximations	
6	14.5 The Chain Rule 14.6 Directional Derivatives and the Gradient Vector	
7	14.7 Maximum and Minimum Values 14.8 Lagrange Multipliers	
8	15.1 Double Integrals over rectangles 15.2 Double Integrals over General Regions	
9	15.3 Double Integrals in Polar Coordinates 15.4 Applications of Double Integrals	

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	15.5 Surface Area	
10	15.6 Triple Integrals 15.7 Triple Integrals in Cylindrical Coordinates	
11	15.8 Triple Integrals in Spherical Coordinates 16.1 Vector Field	
12	16.2 Line Integrals 16.3 The Fundamental Theorem for Line Integrals	
13	16.4 Green's Theorem 16.5 Curl and Divergence	
14	16.6 Parameterized Surfaces and Their Areas 16.7 Surface Integrals 16.8 Stokes' Theorem	
15	16.9 The Divergence Theorem	
16	Final Exam	COMPREHENSIVE

Homework Assignments - MTH203 : (If you want to use a text book) The following are suggested homework exercises. Students are strongly encouraged to do all of them from the textbook by Stewart (8th edition).

Section	Page 8th Ed	Problems	Section	Page 8th Ed	Problems
12.1	792	3,4,5,9,11,13,17,23,31	15.1	988	15,21,25,29,31,34,35,37,39
12.2	798	1,2,3,6,8,9,15,19,23,25,27,41,43	15.2	1001	1,3,7,9,15,16,20,23,25,29,45,47,53
12.3	807	1,6,7,15,17,23,25,27,29,39,45,47	15.3	1010	1,2,5,7,9,15,19,25,26,29
12.4	814	3,7,11,13,16,19,27,33	15.4	1016	3,5,7,11,17
12.5	823	1,3,7,13,19,23,31,51,63, 69,71,73	15.5	1026	1,2,3,5
12.6	834	1,2,3,5,7,11,19,21,22,23,24,25,26,27,28	15.6	1029	3,5,9,11,21,29,35
13.1	848	1,3,5,7,11,21,22,23,24,25,26,27	15.7	1040	3,5,6,7,9,11,17,21
13.2	855	3,5,9,16,19,21,25,35,39,47,53,55	15.8	1044	1,3,5,6,7,9,11,21,22,23
13.3	861	3,4,5,17,20	16.1	1068	3,11,21
13.4	870	3,5,6,9,10,11,15,16	16.2	1075	3,7,11,15,19,21,39
14.1	888	9,10,11,17,19,20,25,27,32,45,47,49	16.3	1087	3,5,14,15,20,31,32,35
14.2	903	1,5,9,10,11,13,15,16,17,31,32,37,39,41	16.4	1096	1,3,7,11,17
14.3	911	15,21,22,23,25,26,33,34,42,43, 51 53, 61,65,67	16.5	1103	1,5,12,13,19,25
14.4	927	3,4,5,13,14,17,19	16.6	1111	1,13,19,23,33,39,45,49
14.5	937	1,3,7,8,17,21,22,27	16.7	1122	4,9,17,20,27
14.6	946	5,7,9,11,12,15,21,22,41,42,43	16.8	1134	1,3,5,7,15

14.7	959	5,9,13,21,31,33,43,45,48	16.9	1141	1,5,7,10
14.8	971	3,5,7,17,21			