



## COURSE SYLLABUS

<b>A. Course Title &amp; Number</b>	Calculus III – 110101201					
<b>B. Pre/Co-requisite(s)</b>	Calculus II (110101102)					
<b>C. Number of credits</b>	3					
<b>D. Faculty Name</b>	Ramzi albadarneh					
<b>E. Term/Year</b>	First Semester 2021/2022					
<b>F. Sections</b>	<b>Section No.</b>	<b>Time</b>	<b>Location</b>			
	1	10-11	مجمع شرقي م.ش.305			
	2	11-12	مجمع شرقي م.ش.306			
	3	14-15	مجمع شرقي م.ش.102			
<b>G. Instructor's Information</b>	<b>Instructor</b>	<b>Office</b>	<b>Email</b>			
	Dr.Ramzi albadarneh	مبنى كلية العلوم ٢١١	rbadarneh@hu.edu.jo			
<b>H. Office Hours</b>	<b>Sunday</b>	<b>Tuesday</b>	<b>Thursday</b>			
	12-13	12-13	12-13			
<b>I. Course Description</b>	Vectors and analytic geometry in space, functions of several variables, and their limits, partial differentiation, directional derivatives, extrema of functions of several variables with their applications, multiple integrals: double and triple integrals, and change of variables.					
<b>J. Course Learning Outcomes</b>	<b>Learning Outcomes</b>					<b>Assessment Instruments</b>
	1	Demonstrate the ability to analyze and visualize curves, surfaces, and regions in 2 and 3 dimensions, in Cartesian, polar, cylindrical, and spherical coordinate systems.				1 <sup>st</sup> &2 <sup>nd</sup> or Mid and/or Final Exam
	2	Perform calculus operations on vector-valued functions including limits, derivatives, integrals, curvature, and the description of motion in space.				1 <sup>st</sup> &2 <sup>nd</sup> or Mid and/or Final Exam
	3	Perform calculus operations on functions of several variables including limits, partial derivatives, directional derivatives, and multiple integrals.				1 <sup>st</sup> &2 <sup>nd</sup> or Mid and/or Final Exam
	4	Find and classify extrema and tangent planes of functions of several variables.				1 <sup>st</sup> &2 <sup>nd</sup> or Mid and/or Final Exam
<b>K. Textbook and References</b>	<b>Text Book:</b>					
	<ul style="list-style-type: none"> <li>○ Calculus Early transcendentals, by James Stewart, 7th Edition; McMASTER UNIVERSITY AND UNIVERSITY OF TORONTO.</li> </ul>					
	<b>References:</b>					
	<ul style="list-style-type: none"> <li>○ Calculus, Early Transcendentals, by H. Anton, I. Bivens, and S. Davis, John Wiley &amp; Sons, Inc., 11th edition, 2016.</li> <li>○ Thomas' Calculus, by Joel R. Hass, Christopher E. Heil, and Maurice D. Weir, Pearson, 14th Edition, 2017.</li> </ul>					
<b>L. Teaching and Learning Methodologies</b>	This is a traditional lecture based course. Students tested and given feedback throughout the semester regular exams and the discussions in class.					
<b>M. Assessment of Student Learning</b>	<b>Assessment Category</b>	<b>Assessment Type</b>	<b>%</b>	<b>Assessment Description</b>		<b>Due Date</b>
	Test	First Exam	30	This exam will cover topics learned from week 1 to week 6. It will measure the degree of conceptual and procedural understanding a student has gained.		will be assigned Later
	Test	Second Exam	30	This exam will cover topics learned from week 6 to week 12. It will measure the degree of conceptual and procedural understanding a student has gained.		will be assigned Later
	Test	Final Exam	40	This exam will cover topics learned from week 1 to week 16 with more focus on topics learned from weeks 12-15. Its structure, and the breakdown of the questions included are similar to the ones for the first and second exams.		It will be assigned by the registrar's office
<b>N. Rules and Regulations</b>	<p><b>Make-up:</b> If a student has a valid reason for missing an examination, he/she may be granted an opportunity to make up the exam by the Math department. The student must submit a request for a make-up exam in writing to the instructor of the course within 48 hours of the scheduled examination time. The request must state clear and compelling reasons for the student's absence and include any relevant supporting documentation: statement from a certified medical doctor, clinic or hospital, detailing the medical condition, or a written explanation regarding an emergency. The instructor will look into the requests and decide within 24 hours. Make-up exam will be paper based and completely different from the one given in class.</p> <p><b>Attendance:</b> Attendance and Lateness policy as described in the Undergraduate catalog will be strictly implemented in this course. In case you find yourself in a situation that prevents you from attending class or exam, you have to inform your instructor.</p>					
<b>O. Student Academic Integrity Code Statement</b>	All students are expected to abide by the Student Academic Integrity Code as articulated in the HU undergraduate catalog.					



## Weekly Outline

Week	CHAPTER
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
2	12.6 Cylinders and Quadric Surfaces
3	13.1 Vector Functions and Space Curves 13.2 Derivatives and Integrals of Vector Functions
3	13.3 Arc Length and Curvature 13.4 Motion in Space: Velocity and Acceleration-Optional
4	14.1 Functions of Several Variables
4	14.2 Limits and Continuity 14.3 Partial Derivatives
5	14.3 Tangent Planes and Linear Approximations 14.4 The Chain Rule
5	14.5 Directional Derivatives and the Gradient Vector 14.6 Maximum and Minimum Values
6	14.7 Lagrange Multipliers-Optional
6	15.1 Double Integrals over rectangles 15.2 Iterated Integrals
7	15.3 Double Integrals over General Regions 15.4 Double Integrals in Polar Coordinates
7	15.5 Applications of Double Integrals-Optional 15.7 Triple Integrals
8	15.8 Triple Integrals in Cylindrical Coordinates 15.9 Triple Integrals in Spherical Coordinates 15.10 Change of Variables in Multiple Integrals-Optional



## COURSE SYLLABUS

**Homework Assignments – Calculus III:** Students are strongly encouraged to solve at least all of the following suggested exercises from the textbook. If you need any help you can consult me during my office hours or by appointment.

Section	Page (7 <sup>th</sup> Ed)	Problems	Section	Page (7 <sup>th</sup> Ed)	Problems
12.1	790	2,5,6,11,13,17,23,30,31	15.1	981	11,12,13,14
12.2	798	3,4,6,17,22,24,25,26,29	15.2	987	1,3,7,9,15,16,20,23,25,29,30,31
12.3	806	1,6,7,10,11,17,19,22,24,26,41,47	15.3	995	1,2,5,7,9,13,16,17,19,20,25,26,29
12.4	814	3,8,11,13,14,16,19,27,31,33	15.4	1002	3,5,7,11,17,19,22,25,27
12.5	824	3,4,5,7,13,19,23,28,31,46,51,57,60, 69,71,73	15.5	1012	1,2,3,5
12.6	832	3,4,6,11,14,19,21,22,23,24,25,26,27,28	15.6	1016	3,5,9,11
13.1	845	1,4,5,7,11,21,22,23,24,25,26,27	15.7	1025	2,3,5,6,7,9,11,17,21,22
13.2	852	3,5,9,14,19,21,25,35,39,47	15.8	1031	1,3,5,6,7,9,11,19,21,22,23,29,30
13.3	860	3,4,5,17,20,24	15.9	1037	1,3,5,7,9,10,11,13,21,23,25,30, 35,39,40
13.4	870	3,5,6,9,10,11,15,16			
14.1	888	9,10,11,15,17,19,32,45,47,49			
14.2	899	5,7,9,10,11,13,15,16,17,31,32,37,39,41			
14.3	911	15,21,22,23,25,26,33,34,42,43, 47,51 53, 61,65,67			
14.4	922	3,4,5,13,14			
14.5	930	1,3,7,11,17,21,22,27			
14.6	943	5,7,9,11,12,15,19,21,22			
14.7	953	5,9,13,31,33,43			
14.8	971	3,5,7,17,21			

I advise you is to solve more than the above Exercises.