



**Maths 204 Syllabus**

<b>1. College</b>	Science										
<b>2. Department</b>	Mathematics										
<b>3. Program</b>	B.Sc in Mathematics										
<b>4. Course code</b>	Maths 204										
<b>5. Course title</b>	Calculus and Analytic Geometry III										
<b>6. Course credits:</b>	Lecture Hours: 3	Lab Hours: 0	Credit Hours: 3								
<b>7. Pre-requisites:</b>	None										
<b>8. Course web-page:</b>	www.webassign.com										
<b>9. Lectures Timing &amp; Location</b>											
<b>10. Course coordinator</b>	Dr. Ahmed Matar										
<b>11. Academic year</b>	2020-2021										
<b>12. Semester:</b>	✓	<b>First</b>		<b>Second</b>		<b>Summer</b>					
<b>13. Textbook(s):</b>	James Stewart, Calculus, Early Transcendentals, 2017, 8th Edition, Brooks/Cole Cengage Learning,										
<b>14. References:</b>	Thomas Calculus, by Thomas, Weirr and Hass, 12 <sup>th</sup> Edition (Pearson) Calculus, by Smith and Minton. 4 <sup>th</sup> edition (McGraw-Hill)										
<b>15. Other resources used (e.g. e-Learning, field visits, periodicals, software, etc.):</b>	<ul style="list-style-type: none"> <li>Paul's Online Math. Notes : <a href="http://tutorial.math.lamar.edu">http://tutorial.math.lamar.edu</a></li> <li>Salman Khan Academy: <a href="http://www.khanacademy.org/math/calculus/differential-calculus/">http://www.khanacademy.org/math/calculus/differential-calculus/</a></li> </ul>										
<b>16. Course description (from the catalog):</b>	<i>Algebra. Functions and graphs. Trigonometry. Conic sections. Limits and continuity. Derivatives and integrals . Applications of derivatives which include Mean-Value Theorem , extrema of functions and optimization. Definite integrals and the Fundamental Theorem of Calculus. Derivatives and integrals of exponential, logarithmic and inverse trigonometric functions</i>										
<b>17. Course Intended Learning Outcomes (CILOs):</b>	<i>Students who successfully complete this course should be able to:</i>										
	<b>Mapping to PILOs</b>										
<b>CILOs</b>	<i>a</i>	<i>b</i>	<i>c</i>	<i>d</i>	<i>e</i>	<i>f</i>	<i>g</i>	<i>h</i>	<i>i</i>	<i>j</i>	<i>k</i>
1-Recall basic theory, concepts and graphs of vectors, vector-valued functions and multivariable functions.	✓			✓							
2-Sketch cylinders and quadrics in space.	✓										
3-Evaluate limits, derivatives, and integrals for multivariable functions and vector-valued functions.	✓										
4-Find extrema and tangent planes of multivariable functions.	✓		✓								
5-Utilize multiple integrals to find areas and volumes.	✓		✓	✓							
6-Apply theorems of vector calculus to simplify integration problems.	✓			✓							

<b>18. Course assessment:</b>				
<i>Assessment Type</i>	<i>CILOs coverage</i>	<i>Number</i>	<i>Weight</i>	<i>Date</i>
<i>Tests</i>	All	2	20% each	TBA
<i>Laboratory/Practical</i>				
<i>Assignments/Online Homework</i>	All	22	20%	TBA
<i>Projects/Case Studies</i>			-	
<i>Final</i>	All	1	40%	11/1/21
<b>Total</b>			100%	

**19. Attendance Policy:**

*Extracts from the University Bulletin regarding withdrawal and enforced withdrawal:*

*A student's absence from lectures or classes in excess of 25% of the total assigned session will result in an automatic withdrawal of the student from the course, regardless of the causes for his/her absence.*

- a) A grade of (W) is given to a student who misses 25% or more of the total sessions assigned to the course if he/she presents a valid excuse for his/her absence.*
- b) A grade of (WF) is given to a student who misses 25% or more, but with no valid excuse.*

**20. Academic Honesty and Plagiarism:**

*All students are expected to follow the specific rules of academic honesty and plagiarism as per The Regulation of Professional conduct Violations for University of Bahrain Students, decision # 4/2006. Please refer the UoB website-Deanship of Students Affairs-Guidance Office.*

## 21.Course Weekly Breakdown:

<i>Week</i>	<i>Date</i>	<i>Topics covered</i>	<i>CILOs</i>	<i>Teaching Method</i>	<i>Assessment</i>
1	20/9/2020	12.1 Three-Dimensional Coordinate Systems 12.2 Vectors 12.3 The Dot Product	1 1 1	<i>Lecture &amp; Problem solving</i>	HW 1, Test 1 & Final Exam
2	27/9/2020	12.4 The Cross Product 12.5 Equations of Lines and Planes	1 1	<i>Lecture &amp; Problem solving</i>	HW 1, HW 2, Test 1 & Final Exam
3	4/10/2020	12.6 Cylinders and Quadric Surfaces 13.1 Vector Functions and Space Curves	2 1	<i>Lecture &amp; Problem solving</i>	HW 3, HW4, Test 1 & Final Exam
4	11/10/2020	13.2 Derivatives and Integrals of Vector Functions 13.3 Arc Length and Curvature	1,3 1,3 1,3	<i>Lecture &amp; Problem solving</i>	HW 4, HW 5, Test 1 & Final Exam
5	18/20/2020	14.1 Functions of Several Variables 14.3 Partial Derivatives	3 3	<i>Lecture &amp; Problem solving</i>	HW 6, HW 7, Test 1 & Final Exam
6	25/10/2020	14.4 Tangent Planes 14.5 The Chain Rule	3,4 3	<i>Lecture &amp; Problem solving</i>	HW 8, Test 1 & Final Exam
7	1/11/2020	14.6 Directional Derivatives and the Gradient Vector	3,4	<i>Lecture &amp; Problem solving</i>	HW 9, HW 10, Test 1 & Final Exam
8	8/11/2020	<b>Midsemester break</b>			
9	15/11/2020	14.7 Maximum and Minimum Values 14.8 Lagrange Multipliers	3,4 3,4	<i>Lecture &amp; Problem solving</i>	HW 11, Test 2 & Final HW 12, Test 2 & Final
10	22/11/2020	15.1 Double Integrals over Rectangles 15.2 Double Integrals over General Regions	5 5	<i>Lecture &amp; Problem solving</i>	HW 13, HW 14, Test 2 & Final Exam
11	29/11/2020	15.3 Double Integrals in Polar Coordinates 15.6 Triple Integrals	5 5	<i>Lecture &amp; Problem solving</i>	HW 15, HW16, Test 2 & Final Exam
12	6/12/2020	15.7 Triple Integrals in Cylindrical Coordinates 15.8 Triple Integrals in Spherical Coordinates	5 5	<i>Lecture &amp; Problem solving</i>	HW 17, HW 18, Test 2 & Final Exam
13	13/12/2020	16.1 Vector fields	6	<i>Lecture &amp; Problem solving</i>	HW 19, HW 20 & Final Exam
14	20/12/2020	16.2 Line Integrals	6	<i>Lecture &amp; Problem solving</i>	HW 21, HW 22 & Final Exam
15	27/12/2020	16.3 The Fundamental Theorem for Line Integrals 16.4 Green's Theorem	6 5,6	<i>Lecture &amp; Problem solving</i>	Final Exam

### Weekly Problems & Important Dates

Week	Date	Topics covered	Examples	Problems	Important Dates
1	20/9/2020	12.1 Three-Dimensional Coordinate Systems 12.2 Vectors 12.3 The Dot Product	1-6 1-6 1-6	1-20,22-24,38 1-29,41,42 1-13,15-47	
2	27/9/2020	12.4 The Cross Product 12.5 Equations of Lines and Planes	1-5 1-10	1-38,43 1-40,45-68,71-74	
3	4/10/2020	12.6 Cylinders and Quadric Surfaces 13.1 Vector Functions and Space Curves	1,2,5,6,7,8 1-6	31-38 1-14,17-20	
4	11/10/2020	13.2 Derivatives and Integrals of Vector Functions 13.3 Arc Length and Curvature	1-5 1,3,4,5,6	9-16,28,33-42 1-9	
5	18/20/2020	14.1 Functions of Several Variables 14.3 Partial Derivatives	1,4,5,6,8,10,11,14,15 1,2,4-10	9-22, 45-52, 61-70, 71-72 15-72	
6	25/10/2020	14.4 Tangent Planes 14.5 The Chain Rule	1 1,3-9	1-6 1-34,45-48	<b>29/10 Prophet's birthday</b>
7	1/11/2020	14.6 Directional Derivatives and the Gradient Vector	2-8	4-29	
8	8/11/2020	<b>Midsemester break</b>			
9	15/11/2020	14.7 Maximum and Minimum Values 14.8 Lagrange Multipliers	1-5,7 2-4	5-22, 31-38,41-43 3-14	
10	22/11/2020	15.1 Double Integrals over Rectangles 15.2 Double Integrals over General Regions	2,4-8 1-5	9-11,13-34, 37-43 1-10, 13-32,51-58	
11	29/11/2020	15.3 Double Integrals in Polar Coordinates 15.6 Triple Integrals	1,2 1-5	7-14, 19-27, 29-32 1-22,27-36	
12	6/12/2020	15.7 Triple Integrals in Cylindrical Coordinates 15.8 Triple Integrals in Spherical Coordinates	1-3 1-4	1-12, 17-24, 29, 30 1-14,17-26, 41-43	
13	13/12/2020	16.1 Vector fields	1,2	1-10,21-24	<b>16-17/12 National Day</b>
14	20/12/2020	16.2 Line Integrals	1,2, 4-8	1-16, 19-22	
15	27/12/2020	16.3 The Fundamental Theorem for Line Integrals 16.4 Green's Theorem	2-5 1,2	3-10, 12-20 1-14	