



**Maths 121 Syllabus**

1. College	Science										
2. Department	Mathematics										
3. Program	B.Sc in Mathematics										
4. Course code	Maths 121										
5. Course title	Calculus and Analytic Geometry I										
6. Course credits:	Lecture Hours: 3	Lab Hours: 0	Credit Hours: 3								
7. Pre-requisites:	None										
8. Course web-page:	www.webassign.com										
9. Lectures Timing & Location											
10. Course coordinator	Dr. Ahmed Matar										
11. Academic year	2020-2021										
12. Semester:	✓	First		Second		Summer					
13. Textbook(s):	James Stewart, Calculus, Early Transcendentals, 2017, 8th Edition, Brooks/Cole Cengage Learning,										
14. References:	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)										
15. Other resources used (e.g. e-Learning, field visits, periodicals, software, etc.):	<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>										
16. Course description (from the catalog):	<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>										
17. Course Intended Learning Outcomes (CILOs):	<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. Evaluate limits of functions both geometrically and algebraically.	✓								✓	✓	
2. Examine continuity of various types of functions at a point or on a set.									✓	✓	
3. Find derivatives of explicit and implicit functions.	✓								✓		
4. Evaluate definite and indefinite integrals.	✓								✓	✓	
5. Employ differentiation to describe the behavior of functions.	✓								✓		

6. Apply derivatives to solve real life problems such as optimization and related rates.	√									√		
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<b>18. Course assessment:</b>				
<i>Assessment Type</i>	<i>CILOs coverage</i>	<i>Number</i>	<i>Weight</i>	<i>Date</i>
<i>Online Quizzes</i>	TBA	TBA		TBA
<i>Tests</i>	TBA	TBA		TBA
<i>Laboratory/Practical</i>				
<i>Assignments/Online Homework</i>	TBA	TBA		TBA
<i>Projects/Case Studies</i>			-	
<i>Final</i>	TBA	TBA	-	TBA
<b>Total</b>			100%	

<b>19. Attendance Policy:</b>
<i>Extracts from the University Bulletin regarding withdrawal and enforced withdrawal:</i>
<i>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.</i>
<i>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.</i>
<i>b) A grade of (WF) is given to a student who misses 25% or more, but with no valid excuse.</i>
<b>20. Academic Honesty and Plagiarism:</b>
<i>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.</i>

## 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	1.1 Four Ways to represent a function 1.3 New functions from old functions 1.4 Exponential functions 1.5 Inverse functions and logarithms	1	<i>Lecture &amp; Problem solving</i>	HW 1, Test 1 & Final Exam
2	27/9/2020	2.2 The limit of a function 2.3 Limit rules	1 1	<i>Lecture &amp; Problem solving</i>	HW 1, HW 2, Test 1 & Final Exam
3	4/10/2020	2.5 Continuity	2	<i>Lecture &amp; Problem solving</i>	HW 3, HW4, Test 1 & Final Exam
4	11/10/2020	2.6 Limits at infinity 2.8 The derivative as a function	1 1,3	<i>Lecture &amp; Problem solving</i>	HW 4, HW 5, Test 1 & Final Exam
5	18/20/2020	3.1 Derivative of Polynomials and Exponential functions 3.2 Differentiation rules	3 3	<i>Lecture &amp; Problem solving</i>	HW 6, HW 7, Test 1 & Final Exam
6	25/10/2020	3.3 Derivative of trigonometric functions 3.4 Chain Rule	3 3	<i>Lecture &amp; Problem solving</i>	HW 8, Test 1 & Final Exam
7	1/11/2020	3.5 Implicit Differentiation	3	<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	3.6 Logarithmic Differentiation	3	<i>Lecture &amp; Problem solving</i>	HW 11, Test 2 & Final HW 12, Test 2 & Final
10	22/11/2020	3.9 Related Rates	3,6	<i>Lecture &amp; Problem solving</i>	HW 13, HW 14 , Test 2 & Final Exam
11	29/11/2020	3.10 Linearization and differentials 3.11 Hyperbolic functions 4.1 Maximum and Minimum	3,6 3 3	<i>Lecture &amp; Problem solving</i>	HW 15, HW16, Test 2 & Final Exam
12	6/12/2020	4.1 Maximum and Minimum 4.2 The mean value theorem 4.3 The shape of a graph	3 3 3	<i>Lecture &amp; Problem solving</i>	HW 17, HW 18, Test 2 & Final Exam
13	13/12/2020	4.3 The shape of a graph 4.7 Optimization problems	3 3,6	<i>Lecture &amp; Problem solving</i>	HW 19, HW 20 & Final Exam
14	20/12/2020	4.7 Optimization problems 4.9 Antiderivative	3,6 4	<i>Lecture &amp; Problem solving</i>	HW 21, HW 22 & Final Exam
15	27/12/2020	4.9 Antiderivative 5.2 The definite integral 5.3 The fundamental theorem of Calculus 5.4 Indefinite integral	4 4 3,4 4	<i>Lecture &amp; Problem solving</i>	Final Exam

## Weekly Problems & Important Dates

Week	Date	Topics covered	Examples	Problems	Important Dates
1	20/9/2020	1.1 Four Ways to represent a function 1.3 New functions from old functions 1.4 Exponential functions 1.5 Inverse functions and logarithms	1,2,3,6,7,11  6,7,8  1-4,6-10,12	1-4, 7-10, 25, 27-30, 31-37  31-53  1-4,6, 11-16, 23 1-12, 15-18, 21-26, 33-42, 51-54,63-68	
2	27/9/2020	2.2 The limit of a function 2.3 Limit rules	1-5,7-9 1-6,8-11	4-9, 31-43 1-32, 37-46, 52(a), 53, 54(b), 55	
3	4/10/2020	2.5 Continuity	1-9	3,4,11-32,45-49	
4	11/10/2020	2.6 Limits at infinity 2.8 The derivative as a function	1-11 2-7	3,4,13-42 21-31,57,63	
5	18/20/2020	3.1 Derivative of Polynomials and Exponential functions 3.2 Differentiation rules	1-9 1-5	1, 3-38, 45, 46, 50(a)(b), 55-59,61, 71-72 1-34,41-44,45-48	
6	25/10/2020	3.3 Derivative of trigonometric functions 3.4 Chain Rule	1-6 1-9	1-24,39-52 1-54,61-64,77,78	<b>29/10 Prophet's birthday</b>
7	1/11/2020	3.5 Implicit Differentiation	1-5	1-32,35-38,49-60	
8	8/11/2020	<b>Midsemester break</b>			
9	15/11/2020	3.6 Logarithmic Differentiation	1-8	2-26,31-34,39-50	
10	22/11/2020	3.9 Related Rates	1-5	3-12, 13-16, 17-19,22- 23,32-33,45,47,48	
11	29/11/2020	3.10 Linearization and differentials 3.11 Hyperbolic functions 4.1 Maximum and Minimum	1 1-2 1-4,7,8	1-4,11-14,23-28  1-10,30-41 29-44,47-62	
12	6/12/2020	4.1 Maximum and Minimum 4.2 The mean value theorem 4.3 The shape of a graph	1-4,7,8 3,5 1-3,5,6	29-44,47-62 11-14,17,25-27 9-21,24-31,37-45	
13	13/12/2020	4.3 The shape of a graph 4.7 Optimization problems	1-3,5,6 1-3,5	9-21,24-31,37-45 2-8, 13-15, 21-23, 27- 28,31,34,37,38,54-57	<b>16-17/12 National Day</b>
14	20/12/2020	4.7 Optimization problems 4.9 Antiderivative	1-3,5 1-4	2-8, 13-15, 21-23, 27- 28,31,34,37,38,54-57 1-18,20-22,31-43,45- 48,59-64	
15	27/12/2020	4.9 Antiderivative 5.2 The definite integral 5.3 The fundamental theorem of Calculus 5.4 Indefinite integral	1-4 7 1-9 2-5	1-18,20-22, 31-43, 45- 48,59-64 33,34,48,49 7-18,19-44 5-18,21-46	