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	2019-2020						
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, 12th Edition (Pearson)
Calculus, by Smith and Minton. 4th edition (McGraw-Hill)

15. Other resources used (e.g. e-Learning, field visits, periodicals, software, etc.):

- Paul's Online Math. Notes : http://tutorial.math.lamar.edu
- Salman Khan Academy: http://www.khanacademy.org/math/calculus/differential-calculus/

16. Course description (from the catalog):

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

17. Course Intended Learning Outcomes (CILOs):

Students who successfully complete this course should be able to:

	Mapping to PILOs										
CILOs	*a*	*b*	*c*	*d*	*e*	*f*	*g*	*h*	*i*	*j*	*k*
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.	✓								✓		

18. Course assessment:			
Assessment Type	*Number*	*Weight*	*Date*
Quizzes	**-**	-	
Tests	***2***	*50%*	TBA
Laboratory/Practical	**-**	-	-
*Assignments/**Online Homework's***	***22***	*10 %*	See Weekly Problems Sheet
Projects/Case Studies	**-**	-	-
Final	***1***	*40%*	***Comprehensive***
Total	***25***	*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 automatics 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:

Week	*Date*	*Topics covered*	*CILOs*	*Teaching Method*	*Assessment*
1	15/9/19	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*	*Lecture & Problem solving*	HW 1,Test 1 & Final Exam
2	22/9/19	2.2 The limit of a function 2.3 Limit rules	*1* *1*	*Lecture & Problem solving*	HW 1, HW 2, Test 1 & Final Exam
3	29/9/19	2.5 Continuity	*2*	*Lecture & Problem solving*	HW 3, HW4, Test 1 & Final Exam
4	6/1019	2.6 Limits at infinity 2.8 The derivative as a function	*1* *1,3*	*Lecture & Problem solving*	HW 4, HW 5, Test 1 & Final Exam
5	13/10/19	3.1 Derivative of Polynomials and Exponential functions 3.2 Differentiation rules	*3* *3*	*Lecture & Problem solving*	HW 6, HW 7, Test 1 & Final Exam
6	20/10/19	3.3 Derivative of trigonometric functions 3.4 Chain Rule	*3* *3*	*Lecture & Problem solving*	HW 8, Test 1 & Final Exam
7	27/10/19	3.5 Implicit Differentiation	*3*	*Lecture & Problem solving*	HW 9, HW 10, Test 1 & Final Exam
8	3/11/19	**Mid-Semester break**			
9	10/11/19	3.6 Logarithmic Differentiation	*3*	*Lecture & Problem solving*	HW 11, Test 2 & Final HW 12, Test 2 & Final
10	17/11/19	3.9 Related Rates	*3,6*	*Lecture & Problem solving*	HW 13,HW 14 , Test 2 & Final Exam
11	24/11/19	3.10 Linearization and differentials 3.11 Hyperbolic functions 4.1 Maximum and Minimum	*3,6* *3* *3*	*Lecture & Problem solving*	HW 15, HW16, Test 2 & Final Exam
12	1/12/19	4.1 Maximum and Minimum 4.2 The mean value theorem 4.3 The shape of a graph	*3* *3* *3*	*Lecture & Problem solving*	HW 17, HW 18, Test 2 & Final Exam
13	8/12/19	4.3 The shape of a graph 4.7 Optimization problems	*3* *3,6*	*Lecture & Problem solving*	HW 19, HW 20 & Final Exam
14	15/12/19	4.7 Optimization problems 4.9 Antiderivative	*3,6* *4*	*Lecture & Problem solving*	HW 21, HW 22 & Final Exam
15	22/12/19	4.9 Antiderivative 5.2 The definite integral 5.3 The fundamental theorem of Calculus	*4* *4* *3,4*	*Lecture & Problem solving*	Final Exam
16	29/12/19	5.4 Indefinite integral	*4*	*Lecture & Problem solving*	Final Exam

Weekly Problems & Important Dates

Week	Date	Topics covered	Examples	Problems	Important Dates
1	15/9/19	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	22/9/19	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	29/9/19	2.5 Continuity	1-9	3,4,11-32,45-49	
4	6/1019	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	13/10/19	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	20/10/19	3.3 Derivative of trigonometric functions 3.4 Chain Rule	1-6 1-9	1-24,39-52 1-54,61-64,77,78	
7	27/10/19	3.5 Implicit Differentiation	1-5	1-32,35-38,49-60	
8	3/11/19	**Mid-Semester break**			**9/11 Prophet's birthday**
9	10/11/19	3.6 Logarithmic Differentiation	1-8	2-26,31-34,39-50	
10	17/11/19	3.9 Related Rates	1-5	3-12, 13-16, 17-19,22-23,32-33,45,47,48	
11	24/11/19	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	1/12/19	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	8/12/19	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	
14	15/12/19	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	**16-17/12 National day**
15	22/12/19	4.9 Antiderivative 5.2 The definite integral 5.3 The fundamental theorem of calculus	1-4 7 1-9	1-18,20-22, 31-43, 45-48,59-64 33,34,48,49 7-18,19-44	
16	29/12/19	5.4 Indefinite integral	2-5	5-18,21-46	**31/12 Last day of classes**