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, 2020, 9th Edition, Brooks/Cole Cengage Learning,

14.   References:

Thomas Calculus, by Thomas, Weir 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:

CILOs	Mapping to PILOs										
	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	CILOs coverage	Number	Weight	Date
Online Quizzes	-	-		
Tests	1-6	2	40%	Test 1 27/3 11:00-12:00 Test 2 8/5 11:00-12:00
Laboratory/Practical	-	-		
Assignments/Online Homework	1-6	22	20%	Throughout the semester
Projects/Case Studies	-	-		
Final	1-6	1	-	1/6/21 11:30-13:30
Total			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	7/2/21	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	14/2/21	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	21/2/21	2.5 Continuity	2	Lecture & Problem solving	HW 3, HW4, Test 1 & Final Exam
4	28/2/21	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	7/3/21	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	14/3/21	3.3 Derivative of trigonometric functions 3.4 Chain Rule	3 3	Lecture & Problem solving	HW 8, Test 1 & Final Exam
7	21/3/21	3.5 Implicit Differentiation	3	Lecture & Problem solving	HW 9, HW 10, Test 1 & Final Exam
8	28/3/21	3.6 Logarithmic Differentiation	3	Lecture & Problem solving	HW 11, Test 2 & Final HW 12, Test 2 & Final
9	4/4/21	**Midsemester break**			
10	11/4/21	3.9 Related Rates	3,6	Lecture & Problem solving	HW 13,HW 14 , Test 2 & Final Exam
11	18/4/21	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	25/4/21	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	2/5/21	4.3 The shape of a graph 4.7 Optimization problems	3 3,6	Lecture & Problem solving	HW 19, HW 20 & Final Exam
14	9/5/21	4.7 Optimization problems 4.9 Antiderivative	3,6 4	Lecture & Problem solving	HW 21, HW 22 & Final Exam
15	16/5/21	4.9 Antiderivative 5.2 The definite integral 5.3 The fundamental theorem of Calculus 5.4 Indefinite integral	4 4 3,4 4	Lecture & Problem solving	Final Exam

Weekly Problems & Important Dates

Week	Date	Topics covered	Examples	Problems	Important Dates
1	*7/2/21*	1.1 Four Ways to represent a function	1,2,3,6-9,11	1-4, 7-18, 33-46,48	
		1.3 New functions from old functions	6-9	33-58, 68-71	
		1.4 Exponential functions	5	1-4, 9-14, 21	
		1.5 Inverse functions and logarithms	1-4,6-10,13	1-20, 23-30, 37-46, 57-60, 69-74	
2	*14/2/21*	2.2 The limit of a function	1-6	4-9, 29-40	
		2.3 Limit rules	1-11	1-34, 39-48, 51(a,b), 52(a,b), 53-57	
3	*21/2/21*	2.5 Continuity	1-9	3-5, 13-24, 27-38, 47-49	
4	*28/2/21*	2.6 Limits at infinity	1-11	3,4,13-42	
		2.8 The derivative as a function	1-7	3-11, 21-32, 57, 63	
5	*7/3/21*	3.1 Derivative of Polynomials and Exponential functions	1-9	1, 3-42, 45, 49-50, 53, 54(a,b), 59-63, 65, 68, 74-76	
		3.2 Differentiation rules	1-5	1-38, 43-50	
6	*14/3/21*	3.3 Derivative of trigonometric functions	1-7	1-30, 31(a), 32(a), 33(a), 34(a), 35-40, 45-62	
		3.4 Chain Rule	1-10	1-60, 61(a), 65-70, 74-78	
7	*21/3/21*	3.5 Implicit Differentiation	1-4	1-36, 39-44	
8	*28/3/21*	3.6 Logarithmic Differentiation	1-10	2-40, 43-78	
9	*4/4/21*	**Midsemester break**			
10	*11/4/21*	3.9 Related Rates	1-5	3-12, 13-16, 17-19, 22, 33, 35, 47, 49, 50	
11	*18/4/21*	3.10 Linearization and differentials	1	1-4,11-18, 31-36	
		3.11 Hyperbolic functions	1-2	1-14, 35-46	
		4.1 Maximum and Minimum	1-8	29-48, 51-66	
12	*25/4/21*	4.1 Maximum and Minimum	1-8	29-48, 51-66	**Labor day 1/5**
		4.2 The mean value theorem	3,5	15-18, 21, 29-31	
		4.3 The shape of a graph	1-3,5-7	9-41, 45-55	
13	*2/5/21*	4.3 The shape of a graph	1-3,5-7	9-41, 45-55	
		4.7 Optimization problems	1-3,5	2-8, 13-21, 25-27, 29-32, 37, 40, 41-44, 60-63	
14	*9/5/21*	4.7 Optimization problems	1-3,5	2-8, 13-21, 25-27, 29-32, 37, 40, 41-44, 60-63	**Eid 12/5-16/5**
		4.9 Antiderivative	1-4,6	1-24, 29-54, 65-70	
15	*16/5/21*	4.9 Antiderivative	1-4,6	1-24, 29-54, 65-70	
		5.2 The definite integral	8	35-36, 58, 59	
		5.3 The fundamental theorem of Calculus	1-9	9-54	
		5.4 Indefinite integral	1-5	5-24, 27-54	