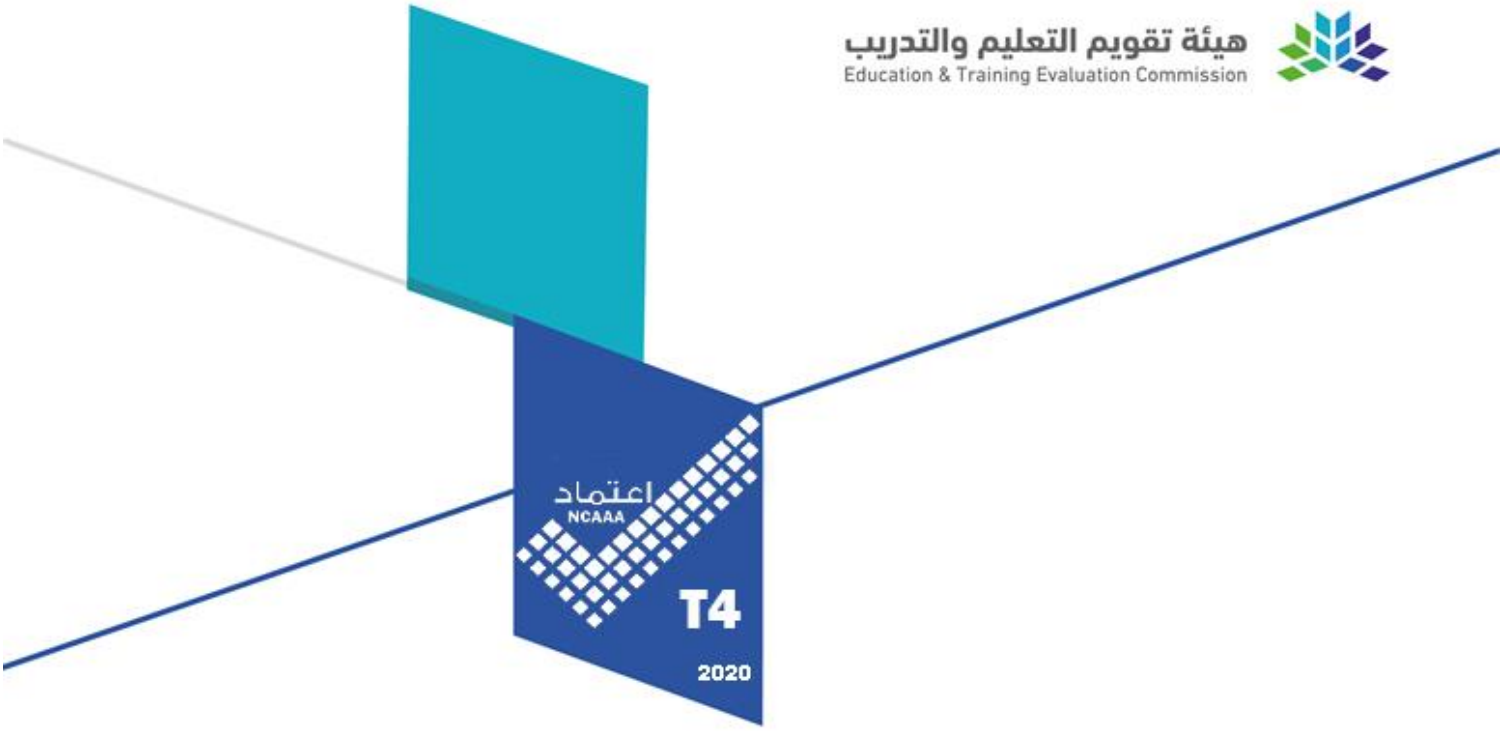
هيئة تقويم التعليم والتدريب
Education & Training Evaluation Commission



Course Specifications

Course Title:	**Calculus (1).**
Course Code:	**48021400-4**
Program:	➢ **The first year common Engineering Track.** ➢ **Engineering students.**
Department:	**Natural Sciences Department**
College:	**Common First Year Deanship**
Institution:	**Umm Al-Qura University**

Table of Contents

A. Course Identification

1. Credit hours:	4.2 credit hours - "1 st Term (Semester) 3+2= 4.2 cr. hrs."
2. Course type	
a.	University ☐ College ☐ Department ■ Others ☐
b.	Required ■ Elective ☐
3. Level/year at which this course is offered:	the first year common
4. Pre-requisites for this course (if any)**: Real numbers**	
5. Co-requisites for this course (if any)**:** **None.**	

6. Mode of Instruction (mark all that apply)

No	Mode of Instruction	Contact Hours	Percentage
1	**Traditional classroom**	3*15=45	80%
2	**Blended**	2	5%
3	**E-learning**		
4	**Distance learning**	2	5%
5	**Other**	4	10%

7. Contact Hours (based on academic semester)

No	Activity	Contact Hours
1	**Lecture**	3*15=45
2	**Laboratory/Studio**	
3	**Tutorial**	16
4	**Practical**	2*15=30
5	**Others (specify)**	4*15=60
	Total	151

B. Course Objectives and Learning Outcomes

1. Course Description

- a process of quarterly review of the content of the course, through the cards assessment of the decision by the teachers of the course.
- Make some proposals for the amendment, in a manner that is suitable for the developers in the light of the quality standards.
- Use modern teaching methods that limit the use of traditional methods.
- Continues updating for content of lectures as a result of recent achievements and researches in the field.
- Encouraging the students to deal with electronic books, as they are using many web based reference material and by providing them with continues update for information.
- Trying to Decrease the direct theoretical teaching load of the course and putting more time for explaining correlations and student-directed learning sessions and seminars.
- Planning for elective self-studies in the course to encourage students to engage in depth study of areas of interest.
- More efforts will be exerted to develop and improve the course to enable the student to clearly

understand the Calculus basis.

2. Course Main Objective

- Using the concepts of introductory calculus.
- Studying a function.
- Studying Applications of the derivative.

3. Course Learning Outcomes

	CLOs	Aligned-PLOs
1	**Knowledge and Understanding**	
1.1	Calculate various forms of limits.	Solve some example during the lecture.
1.2	Calculate derivative of trigonometric functions and polynomials.	Ask the student to clear the misunderstanding of some Math principles.
1.3	Use limits and derivatives to study different functions.	Discussions with the students, and ask quality question.
1.4	Subject taught using the TEAL (Technology Enabled Active Learning) studio format which utilizes small group interaction and current technology to help students develop intuition about, models of problems.	Quizzes, Mid Term Exam, Final Exam
2	**Skills :**	
2.1	How to use laws and principles of Math to understand the subject.	Improvement in the overall performance of the student in consequent examinations during the course.
2.2	How to simplify problems and analyze it.	Interaction of the course and its effect on other courses offered for the students, which can be measured by their feedback.
2.3	Ability to explain the idea with the student own words.	Midterm Exam, Exams.
2.4	Represent the problems mathematically.	Continuous assessment (short quizzes).
2.5	Develop Effective Learning skills.	Homework.
2.6	Develop Problem solving skills.	
2.7	Develop Self-assessment and development.	
2.8	Develop Reading and searching.	
3	**Values:**	
3.1	Work independently.	Those skills are reflected on the student behaviour inside and outside the class. It can be assessed by the feedback from the lecturer regard the student's interaction and behaviour.
3.2	The students learn independently and take up responsibility.	Quizzes.
3.3	Following the learner manners and ethics including; commitment, respect and communication with confidence.	Discussion, Homework.

C. Course Content

No	List of Topics	Contact Hours
1	Lesson 1: Real numbers.	3+2= 4.2
2	Lesson 2: Inequalities and absolute values.	
3	REVIEW & SUMMARY & PROBLEMS.	
4	Lesson 3: Functions and their graphs.	3+2= 4.2

5	Lesson 4: Operation on function.	
6	REVIEW & SUMMARY & PROBLEMS.	
7	Lesson 5: Trigonometric functions.	3+2= 4.2
8	Lesson 6: Introduction to limits	
9	Lesson 7: Limit theorems.	
10	REVIEW & SUMMARY & PROBLEMS.	
11	Lesson 8: Limits at infinity.	3+2= 4.2
12	Lesson 9: Continuity of functions.	
13	REVIEW & SUMMARY & PROBLEMS.	
14	Lesson 10: The derivative.	3+2= 4.2
15	Lesson 11: Rules for finding derivatives.	
16	REVIEW & SUMMARY & PROBLEMS.	
17	Lesson 12: Derivative of trigonometric functions.	3+2= 4.2
18	Lesson 13: The chain rule.	
19	REVIEW & SUMMARY & PROBLEMS.	
20	Lesson 14: Higher order derivatives.	3+2= 4.2
21	Lesson 15: Implicit differentiation.	
22	REVIEW & SUMMARY & PROBLEMS.	
23	Lesson 16: Review1.	3+2= 4.2
24	Midterm Exam.	
25	Lesson 17: Maxima and minima	3+2= 4.2
26	Lesson 18: Monotonicity.	
27	REVIEW & SUMMARY & PROBLEMS.	
28	Lesson 19: concavity.	3+2= 4.2
29	Lesson 20: Local extrema.	
30	REVIEW & SUMMARY & PROBLEMS.	
31	Lesson 21: Graphing functions.	3+2= 4.2
32	Lesson 22: Graphing functions (Complete).	
33	REVIEW & SUMMARY & PROBLEMS.	
34	Lesson 23: The mean value Theorem for derivative.	3+2= 4.2
35	Lesson 24: Antiderivative.	
36	REVIEW & SUMMARY & PROBLEMS.	
37	Lesson 25: Introduction to of differential equation.	3+2= 4.2
38	Lesson 26: Introduction to area..	
39	REVIEW & SUMMARY & PROBLEMS.	
40	Lesson 27: The definite integral	3+2= 4.2
41	Lesson 28: The first fundamental.	
42	REVIEW & SUMMARY & PROBLEMS.	
43	Lesson 29: Review2.	3+2= 4.2
	Final Exam	

D. Teaching and Assessment

1. Alignment of Course Learning Outcomes with Teaching Strategies and Assessment Methods

Code	Course Learning Outcomes	Teaching Strategies	Assessment Methods
1.0	**Knowledge and Understanding**		
1.1	Calculate various forms of limits.	Provide clear and informative lecture notes with learning objectives	Solve some example during the lecture.

Code	Course Learning Outcomes	Teaching Strategies	Assessment Methods
		that focus on important points.	
1.2	Calculate derivative of trigonometric functions and polynomials.	Give clear, informative, and stimulating 50-minute lectures with PowerPoint or other visual electronic aids to enhance the learning experience for students.	Ask the student to clear the misunderstanding of some Math principles.
1.3	Use limits and derivatives to study different functions.	Answer questions either in or outside class or via e-mail or telephone	Discussions with the students, and ask quality question.
1.4	Subject taught using the TEAL (Technology Enabled Active Learning) studio format which utilizes small group interaction and current technology to help students develop intuition about, models of problems.	Compose thoughtful and fair exam questions that assess student learning and application of the course content.	Quizzes
1.5		Directing the case sessions and facilitators to provide an effective learning experience in small group, team-oriented sessions.	Mid Term Exam.
1.6		Providing answers and explanations to student inquiries regarding any aspect of the course.	Final Exam
1.7		Providing advice and assistance to students for improving their learning strategies and performance in the course.	Discussions with the students
1.8		Reviewing and implementing appropriate changes in the course based on student feedback and evaluations.	
1.9		Also; **Written Homework** There will be one homework handed in on paper each week. To receive full credit for your hardcopy homework handed in, you must prepare and submit lucid and clearly reasoned written solutions. These problems will be graded and returned. **In-class Group and**	

Code	Course Learning Outcomes	Teaching Strategies	Assessment Methods
		Personal Assignments In almost all classes, individuals and groups will submit answers to questions done in class, material covered in the lecture in that class, and so on. You must be present in class to receive credit for assignments submitted either by you or by your group. **Group Work** You will be assigned to a group of three for collaborative work. Your group assignment will be announced near the beginning of the term. If you are not satisfied with the way your group is working, first try to discuss it with your group members. If you cannot arrive at a satisfactory solution, then discuss the problems with your instructor. **Tests** There is tests will be given. There will be Midterm and Final exams in the course. The final will be a comprehensive exam and will cover all of the subject material, also Quizzes and Problem sets.	
2.0	**Skills**		
2.1	How to use laws and principles of Math to understand the subject.	Preparing main outlines for teaching.	Improvement in the overall performance of the student in consequent examinations during the course.
2.2	How to simplify problems and analyze it.	Homework assignments	Interaction of the course and its effect on other courses offered for the students, which can be measured by their feedback.
2.3	Ability to explain the idea with the student own words.	Ask the student to do small research.	Midterm Exam, Exams.
2.4	Represent the problems mathematically.	Encourage the student to look for the information in	Continuous assessment (short quizzes).

Code	Course Learning Outcomes	Teaching Strategies	Assessment Methods
		different references.	
2.5	Develop Effective Learning skills.	Reading the problems carefully.	Homework.
2.6	Develop Problem solving skills.		
2.7	Develop Self-assessment and development.		
2.8	Develop Reading and searching.		
3.0	**Values**		
3.1	Work independently.	Learn how to search on the internet and use the library.	Those skills are reflected on the student behaviour inside and outside the class. It can be assessed by the feedback from the lecturer regard the student's interaction and behaviour.
3.2	The students learn independently and take up responsibility.	Learn how to cover missed lectures	Quizzes.
3.3	Following the learner manners and ethics including; commitment, respect and communication with confidence.	Learn how to collect materials of the course.	Discussion
3.4		Learn how to solve difficulties in learning: solving problems – enhance educational skills.	Homework.
3.5		Develop the interest in Math.	Presenting the required research on time and the degree of the quality will show the sense of responsibility.
3.6		Encourage the student to attend lectures regularly by: ➢ Giving bonus marks for attendance ➢ Assigning marks for attendance. ➢ Give students tasks of duties.	

2. Assessment Tasks for Students

#	Assessment task*	Week Due	Percentage of Total Assessment Score
1	Problem sets (Quizzes +Homework).	Around the semester.	10%
2	Midterm Exam	8	30%
3	Test the work of the year	13	15%
4	Final Exam	16	45%

***Assessment task** (i.e., written test, oral test, oral presentation, group project, essay, etc.)

E. Student Academic Counseling and Support

Arrangements for availability of faculty and teaching staff for individual student consultations and academic advice :

- The student has the right to contact the lecturer or coordinators by their e-mails or during their office hours for academic advices or consultations.

F. Learning Resources and Facilities

1. Learning Resources

Required Textbooks	Dale Varberg, Edwin Purcell and Steven Rigdon (2007) .Calculus, (Ninth Edition).oxford. British
Essential References Materials	H. Jerome Keisler (2013). Elementary Calculus: An Infinitesimal Approach revised December.
Electronic Materials	http://faculty.ncu.edu.jm/hforbes/MATHTMETHODS.pdf http://www2.rps205.com/Parents/Academics/Learning/Science/Pages/Physics-First.aspx http://www-math.mit.edu/~djk/calculus_beginners/ http://tutorial.math.lamar.edu/Classes/CalcI/CalcI.aspx
Other Learning Materials	http://en.wikipedia.org/wiki/calculus

2. Facilities Required

Item	Resources
Accommodation (Classrooms, laboratories, demonstration rooms/labs, etc.)	Audio-visual equipment for teaching (projector, microphones, speakers, board.
Technology Resources (AV, data show, Smart Board, software, etc.)	None
Other Resources (Specify, e.g. if specific laboratory equipment is required, list requirements or attach a list)	None

G. Course Quality Evaluation

Evaluation Areas/Issues	Evaluators	Evaluation Methods
Evaluation questionnaires of the staff at the end of the semester.	Students	Discussion.
Reviewing and implementing appropriate changes in the course based on the student feedback and evaluations.	Faculty	Brainstorming.
	Members of staff.	Oriented Discovery.

Evaluation areas (e.g., Effectiveness of teaching and assessment, Extent of achievement of course learning outcomes, Quality of learning resources, etc.)
Evaluators (Students, Faculty, Program Leaders, Peer Reviewer, Others (specify)
Assessment Methods (Direct, Indirect)

H. Specification Approval Data

Council / Committee	Vice Dean of Common First Year for Academic Affairs, Dr Ahmad Fawzi Arbaeen
Reference No.	_
Date	27/3/2022