



**ATTACHMENT 5.**

## **T6. COURSE SPECIFICATIONS (CS)**

## Course Specifications

Institution: Umm Al-Qura University	Date: 2018
College/Department: Deanship of the first year common, Natural Sciences Department.	

### A. Course Identification and General Information

1. Course title and code: Calculus (I), <a href="#">48021400-4</a>	
2. Credit hours: 4.2 credit hours - "1 <sup>st</sup> Term (Semester) 3+2= 4.2 cr. hrs."	
3. Program(s) in which the course is offered. (If general elective available in many programs indicate this rather than list programs) <ul style="list-style-type: none"> <li>➤ The first year common Engineering Track.</li> <li>➤ Engineering students.</li> </ul>	
4. Name of faculty member responsible for the course: Members of staff.	
5. Level/year at which this course is offered: the first year common	
6. Pre-requisites for this course (if any): Real numbers.	
7. Co-requisites for this course (if any): None.	
8. Location if not on main campus: Main Campus.	
9. Mode of Instruction (mark all that apply):	
a. traditional classroom	<input checked="" type="checkbox"/> / What percentage? <input type="text" value="80%"/>
b. blended (traditional and online)	<input checked="" type="checkbox"/> / What percentage? <input type="text" value="5%"/>
c. e-learning	<input type="checkbox"/> / What percentage? <input type="text"/>
d. correspondence	<input checked="" type="checkbox"/> / What percentage? <input type="text" value="5%"/>
f. other	<input checked="" type="checkbox"/> / What percentage? <input type="text" value="10%"/>
Comments:	
<ul style="list-style-type: none"> <li>➤ Exchange of experiences among faculty members who contribute in teaching the same course about the course's vocabulary, requirements and references.</li> <li>➤ To benefit from the experiences of other universities inside and outside the Kingdom in teaching this course in terms of its objectives and vocabulary.</li> </ul>	

## B Objectives

1. What is the main purpose for this course?

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

2. Briefly describe any plans for developing and improving the course that are being implemented. (e.g. increased use of IT or web based reference material, changes in content as a result of new research in the field)

- 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.

## C. Course Description (Note: General description in the form used in Bulletin or handbook)

Course Description:

1. Topics to be Covered

No. of Weeks	Contact hours	List of Topics
1	3+2= 4.2	Lesson 1: Real numbers.
		Lesson 2: Inequalities and absolute values.
		REVIEW & SUMMARY & PROBLEMS.

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

2. Course components (total contact hours and credits per semester):

		Lecture	Tutorial	Laboratory/ Studio	Practical	Other: Office hours	Total
Contact Hours	Planned	3*15= 45	16		2*15= 30	6*15= 80	171
	Actual	3*15= 45	16		1.2*15= 18	6*15= 80	159
Credit	Planned						
	Actual						

3. Additional private study/learning hours expected for students per week.

28 hour

- To carry out the duties and to review and prepare the subjects of the course.

4. Course Learning Outcomes in NQF Domains of Learning and Alignment with Assessment Methods and Teaching Strategy.

- A brief summary of the knowledge or skill the course is intended to develop;
- A description of the teaching strategies to be used in the course to develop that knowledge or skill;
- The methods of student assessment to be used in the course to evaluate learning outcomes in the domain concerned.

**On the table below are the five NQF Learning Domains, numbered in the left column.**

**First**, insert the suitable and measurable course learning outcomes required in the appropriate learning domains (see suggestions below the table). **Second**, insert supporting teaching strategies that fit and align with the assessment methods and intended learning outcomes. **Third**, insert appropriate assessment methods that accurately measure and evaluate the learning outcome. Each course learning outcomes, assessment method, and teaching strategy ought to reasonably fit and flow together as an integrated learning and teaching process. (Courses are not required to include learning outcomes from each domain.)

Code #	NQF Learning Domains And Course Learning Outcomes	Course Teaching Strategies	Course Assessment Methods
<b>1.0</b>	<b>Knowledge</b>		
1.1	Calculate various forms of limits.	Provide clear and informative lecture notes with learning objectives that focus on important points.	Solve some example during the lecture.
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		<p>Also;</p> <p><b>Written Homework</b></p> <p>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.</p> <p><b>In-class Group and Personal Assignments</b></p> <p>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.</p> <p><b>Group Work</b></p> <p>You will be assigned to a group of three for collaborative work. Your</p>	

		<p>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.</p> <p><b>Tests</b></p> <p>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.</p>	
<b>2.0</b>	<b>Cognitive Skills</b>		
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 different references.	Continuous assessment (short quizzes).
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.		

<b>3.0</b>	<b>Interpersonal Skills &amp; Responsibility</b>		
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: <ul style="list-style-type: none"> <li>➤ Giving bonus marks for attendance</li> <li>➤ Assigning marks for attendance.</li> <li>➤ Give students tasks of duties.</li> </ul>	
<b>4.0</b>	<b>Communication, Information Technology, Numerical</b>		
4.1	Computation and designing presentations.	Know the basic mathematical principles.	Their interaction with the lectures and discussions.
4.2	Problem solving.	Use the web for research.	The reports of different asked tasks.
4.3	Data analysis and interpretation.	Discuss with the students	Research.
4.4	Enhance the ability to use the search engines.	Exams to measure the	Comments on some



		mathematical skill.	resulting numbers.
4.5		Clear the weakness points that should be eliminated.	Results of computations and analysis.
4.6		Encourage the student to ask for help if needed.	Homework, Problem solutions assignment and exam should focus on the understanding.
4.7		Encourage the student to ask good questions to help solve the problem.	
4.8		Display the lecture note and homework assignment at the web.	
<b>5.0</b>	<b>Psychomotor</b>		
5.1	Contributions in the improvement of Math education level.	Provide the role and the fundamental of Calculus for students.	It is not included in the overall assessment of the students.
5.2		Develop basic skills and techniques for the study of Math.	

5. Schedule of Assessment Tasks for Students During the Semester			
	Assessment task (i.e., essay, test, quizzes, group project, examination, speech, oral presentation, etc.)	Week Due	Proportion of Total Assessment
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%
Total Assessment		100%	

#### D. Student Academic Counseling and Support

<p>1. Arrangements for availability of faculty and teaching staff for individual student consultations and academic advice. (include amount of time teaching staff are expected to be available each week)</p> <p>➤ 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.</p>
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## E Learning Resources

<p>1. List Required Textbooks</p> <p>➤ Dale Varberg, Edwin Purcell and Steven Rigdon (2007) .Calculus, (Ninth Edition).oxford. British</p>
<p>2. List Essential References Materials (Journals, Reports, etc.)</p> <p>➤ H. Jerome Keisler (2013). Elementary Calculus: An Infinitesimal Approach revised December.</p>
<p>3. List Electronic Materials, Web Sites, Facebook, Twitter, etc.</p> <p>➤ <a href="http://faculty.ncu.edu.jm/hforbes/MATHMETHODS.pdf">http://faculty.ncu.edu.jm/hforbes/MATHMETHODS.pdf</a></p> <p>➤ <a href="http://www2.rps205.com/Parents/Academics/Learning/Science/Pages/Physics-First.aspx">http://www2.rps205.com/Parents/Academics/Learning/Science/Pages/Physics-First.aspx</a></p> <p>➤ <a href="http://www-math.mit.edu/~djk/calculus_beginners/">http://www-math.mit.edu/~djk/calculus_beginners/</a></p> <p>➤ <a href="http://tutorial.math.lamar.edu/Classes/CalcI/CalcI.aspx">http://tutorial.math.lamar.edu/Classes/CalcI/CalcI.aspx</a></p>
<p>4. Other learning material such as computer-based programs/CD, professional standards or regulations and software.</p> <p>➤ <a href="http://en.wikipedia.org/wiki/calculus">http://en.wikipedia.org/wiki/calculus</a></p>

## F. Facilities Required

<p>Indicate requirements for the course including size of classrooms and laboratories (i.e. number of seats in classrooms and laboratories, extent of computer access, etc.)</p>
<p>1. Accommodation (Classrooms, laboratories, demonstration rooms/labs, etc.)</p> <p>➤ Audio-visual equipment for teaching (projector, microphones, speakers, board.</p>
<p>2. Technology resources (AV, data show, Smart Board, software, etc.)</p> <p>None</p>
<p>3. Other resources (specify, e.g. if specific laboratory equipment is required, list requirements or attach list)</p> <p>None</p>

## G Course Evaluation and Improvement Processes

<p>1. Strategies for Obtaining Student Feedback on Effectiveness of Teaching</p> <ul style="list-style-type: none"> <li>➤ Evaluation questionnaires of the staff at the end of the semester.</li> </ul>
<p>2. Other Strategies for Evaluation of Teaching by the Instructor or by the Department</p> <ul style="list-style-type: none"> <li>➤ discussion.</li> <li>➤ Brainstorming.</li> <li>➤ Oriented Discovery.</li> </ul>
<p>3. Processes for Improvement of Teaching</p> <ul style="list-style-type: none"> <li>➤ Reviewing and implementing appropriate changes in the course based on the student feedback and evaluations.</li> </ul>
<p>4. Processes for Verifying Standards of Student Achievement (e.g. check marking by an independent member teaching staff of a sample of student work, periodic exchange and remarking of tests or a sample of assignments with staff at another institution)</p> <p>None</p>
<p>5. Describe the planning arrangements for periodically reviewing course effectiveness and planning for improvement.</p> <ul style="list-style-type: none"> <li>➤ Regular meeting with the staff to review the course effectiveness.</li> </ul>

Name of Course Instructor: \_\_\_\_\_

Signature: \_\_\_\_\_ Date Specification Completed: \_\_\_\_\_

Program Coordinator: \_\_\_\_\_

Signature: \_\_\_\_\_ Date Received: \_\_\_\_\_