



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 (II), 48021401-4			
2. Credit hours: 4.2 credit hours - "2 nd 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)			
 The first year common Engineering Track.  Engineering students.			
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): Calculus (I).			
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 type="text" value="/"/>	What percentage?	<input type="text" value="80%"/>
b. blended (traditional and online)	<input type="text" value="/"/>	What percentage?	<input type="text" value="5%"/>
c. e-learning	<input type="text"/>	What percentage?	<input type="text"/>
d. correspondence	<input type="text" value="/"/>	What percentage?	<input type="text" value="5%"/>
f. other	<input type="text" value="/"/>	What percentage?	<input type="text" value="10%"/>
Comments:			
 Exchange of experiences among faculty members who contribute in teaching the same course about the course's vocabulary, requirements and references.			
 To benefit from the experiences of other universities inside and outside the Kingdom in teaching this course in terms of its objectives and vocabulary.			

B Objectives

1. What is the main purpose for this course?

This course aims to develop the skills of students in the art of integration. This is easily achievable by recalling previous knowledge gained from Calculus (I). Thus in this course, special techniques are introduced that will make integration more of a routine than a guess work.

By the end of the course the students will be able to:

- Compute numerically the area under a curve.
- Evaluate definite integrals.
- Evaluate indefinite integrals.
- Solving separable differential equation.
- Evaluate integrals involving trigonometric functions such as $\sin x$, $\cos x$, $\tan x$, $\cot x$, $\operatorname{cosec} x$ and $\sec x$.
- Evaluate integrals involving rational functions.
- Evaluate integrals involving product functions.
- Obtain reduction formula for certain categories of functions.
- Compute area bounded by two intersecting curves.
- Compute the volumes of solid of revolution by different way.
- Find the distance traveled by a moving object with a constant.
- Compute the work done by compressing or stretching a spring.

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)

- 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 continuous 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: Review of Calculus (I).
		Lesson 2: Antiderivatives.
		REVIEW & SUMMARY & PROBLEMS.
2	3+2= 4.2	Lesson 3: introduction of differential equation.
		Lesson 4: Introduction to area.
		REVIEW & SUMMARY & PROBLEMS.
3	3+2= 4.2	Lesson 5: The first fundamental theorem of calculus.
		Lesson 6: The second fundamental theorem of calculus.
		REVIEW & SUMMARY & PROBLEMS.
4	3+2= 4.2	Lesson 7: Method of substitution.
		Lesson 8: Inverse functions and their derivatives.
		REVIEW & SUMMARY & PROBLEMS.
5	3+2= 4.2	Lesson 9: The natural logarithm function.
		Lesson 10: The natural exponential function.
		REVIEW & SUMMARY & PROBLEMS.
6	3+2= 4.2	Lesson 11: The general exponential and logarithmic functions.
		Lesson 12: The inverse trigonometric functions and their derivatives.
		REVIEW & SUMMARY & PROBLEMS.
7	3+2= 4.2	Lesson 13: The hyperbolic functions and their derivatives.
		Lesson 14: Integration by parts
		REVIEW & SUMMARY & PROBLEMS.
8	3+2= 4.2	Lesson 15: Rationalizing substitutions.
		Lesson 16: Review1.
		REVIEW & SUMMARY & PROBLEMS. Midterm Exam.
9	3+2= 4.2	Lesson 17: Integration of rational functions.
		Lesson 18: Indeterminate forms of type $\frac{0}{0}$.
		REVIEW & SUMMARY & PROBLEMS.
10	3+2= 4.2	Lesson 19: Other indeterminate forms.
		Lesson 20: Improper integrals: Infinite limits of integration.
		REVIEW & SUMMARY & PROBLEMS.
11	3+2= 4.2	Lesson 21: Improper integrals, infinite integrands.
		Lesson 22: The area of a plan region
		REVIEW & SUMMARY & PROBLEMS.
12	3+2= 4.2	Lesson 23: Volume of solids: Slabs, disks.
		Lesson 24: Volume of solids: washers
		REVIEW & SUMMARY & PROBLEMS.

13	3+2= 4.2	Lesson 25: Volume of solids of revolution: Shells.
		Lesson 26: Length of a plan curve.
		REVIEW & SUMMARY & PROBLEMS.
14	3+2= 4.2	Lesson 27: Review2.
		REVIEW & SUMMARY & PROBLEMS.
15	3+2= 4.2	Lesson 28: 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
1.0	Knowledge		
1.1	Develop the skills in the art of integration. This is easily achievable by recalling previous knowledge gained	Provide clear and informative lecture notes with learning objectives that focus on important points.	Solve some example during the lecture.

	from Calculus (I). Thus in this course.		
1.2	Special techniques are introduced that will make integration more of a routine than a guess work.	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	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.	Answer questions either in or outside class or via e-mail or telephone	Discussions with the students, and ask quality question.
1.4	The knowledge is given in form of lectures. Each lecture is accompanied by an assigned reading which is important for mastering the learning objectives	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. (Short exams)
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 Personal	

		<p>Assignments</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>Group Work</p> <p>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.</p> <p>Tests</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>	
2.0	Cognitive Skills		
2.1	The ability to understand integration and identify the most appropriate way to find and understand its applications.	Preparing main outlines for teaching.	Improvement in the overall performance of the student in consequent examinations during the course.
2.2	How to use laws and principles of Math to understand the subject.	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	How to simplify problems, analyze and integrate it.	Encourage the student to look for the information in different references.	Continuous assessment (short quizzes).
2.5	Use simple mathematical methods to integrate.	Reading the problems carefully.	Homework.
2.6	Solve some problems using multiple mathematical rules.	Use available tools (different references and calculators) to develop skills.	
2.7	Develop Problem solving skills.		
2.8	Develop Self-assessment and development.		
2.9	Develop Reading and searching.		
2.10	Develop Effective Learning skills.		
2.11	Represent the problems mathematically.		
3.0	Interpersonal Skills & Responsibility		
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 and brainstorming
3.4	Self-reliance in homework and self-study.	Learn how to solve difficulties in learning: solving problems – enhance educational skills.	Homework.
3.5	Follow the students through their interaction with some.	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"> ➤ Giving bonus marks for attendance ➤ Assigning marks for attendance. ➤ Rewarding students financially and morally ➤ Give students tasks of duties. 	
3.7		Learn how to summarize lectures or to collect materials of the course.	
4.0	Communication, Information Technology, Numerical		
4.1	Design and display presentations accurately.	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 aspects of learning calculus (2).	Comments on some resulting numbers.
4.5	Attention to duties and the use of information technology and the Internet in research.	Treating weaknesses points that should be eliminated.	Results of computations and analysis.
4.6		Strengthen the strengths to be strengthened.	Homework, Problem solutions assignment and exam should focus on the understanding.
4.7		Encourage the student to ask for help if needed	
4.8		Encourage students to develop their skills in using the means available to understand the scientific material.	

4.9		Encourage the student to ask good questions to help solve the problem.	
4.10		Display the lecture note and homework assignment at the web.	
5.0	Psychomotor		
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 general Math, special calculus.	

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	practical Exam	13	15%
4	Final Exam	16	45%
Total Assessment		100%	

D. Student Academic Counseling and Support

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)

- 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.

E Learning Resources

1. List Required Textbooks

- Dale Varberg, Edwin Purcell and Steven Rigdon (2007) .Calculus, (Ninth Edition).oxford. British

2. List Essential References Materials (Journals, Reports, etc.)

- Dummit, Evan (2012). Introduction to Integration.

<p>3. List Electronic Materials, Web Sites, Facebook, Twitter, etc.</p> <ul style="list-style-type: none"> ➤ 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/CalcII/CalcII.aspx ➤ http://faculty.ncu.edu.jm/hforbes/MATHTMETHODS.pdf
<p>4. Other learning material such as computer-based programs/CD, professional standards or regulations and software.</p> <ul style="list-style-type: none"> ➤ http://en.wikipedia.org/wiki/calculus

F. Facilities Required

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.)
1. Accommodation (Classrooms, laboratories, demonstration rooms/labs, etc.)
➤ Audio-visual equipment for teaching (projector, microphones, speakers, board.
2. Technology resources (AV, data show, Smart Board, software, etc.)
MathXpert program
3. Other resources (specify, e.g. if specific laboratory equipment is required, list requirements or attach list)
None

G Course Evaluation and Improvement Processes

1. Strategies for Obtaining Student Feedback on Effectiveness of Teaching
➤ Evaluation questionnaires of the staff at the end of the semester.
➤ Competition, homework, and self-learning
2. Other Strategies for Evaluation of Teaching by the Instructor or by the Department
➤ Discussion.
➤ Brainstorming.
➤ Oriented Discovery.
➤ Evaluation by the coordinator
➤ Evaluation by The trainer.
3. Processes for Improvement of Teaching
➤ Reviewing and implementing appropriate changes in the course based on the student feedback and evaluations.
➤ Drafting the course for people with special needs.

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)

None

5. Describe the planning arrangements for periodically reviewing course effectiveness and planning for improvement.

➤ Regular meeting with the staff to review the course effectiveness.

Name of Course Instructor: _____

Signature: _____ Date Specification Completed: _____

Program Coordinator: _____

Signature: _____ Date Received: _____