ATTACHMENT 5.

T6. COURSE SPECIFICATIONS (CS)

Math 106

هيئة تقويم التعليم
Education Evaluation Commission

Course Specifications

Institution: King Saud University	Date: 24/2/2018
College/Department : College of Sciences/ Math department	

A. Course Identification and General Information

1. Course title and code: Integral Calculus Math106
2. Credit hours: 3
3. Program(s) in which the course is offered.
(If general elective available in many programs indicate this rather than list programs)
Bachelor in engineering and computer sciences
4. Name of faculty member responsible for the course
Dr Houcine Sadraoui
5. Level/year at which this course is offered: first level/ second year
6. Pre-requisites for this course (if any): Math150
7. Co-requisites for this course (if any):
8. Location if not on main campus:
9. Mode of Instruction (mark all that apply):

- Traditional classroom	yes	What percentage?	100
- Traditional and online	no	percentage?	
- E-learning	no	What percentage?	
- Correspondence	no	What percentage?	
-Other	no	What percentage?	

Comments:

B Objectives

What is the main purpose for this course?

The course aims to introduce the following concepts:
1- Definite and indefinite integrals
2- Various methods of integration
3- Applications of integrals in different areas

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)

- Encourage students to read about applications of integral calculus from different sources.
- Encourage students to use internet to look for related websites and references.

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

Course Description:
This course covers the basics of integral calculus: indefinite and definite integrals, the fundamental theorem of calculus, the mean value theorem, numerical integration, L'Hopital's rule , various methods of integration, applications of integrals to compute areas and volumes, parametric curves and polar coordinates.

1. Topics to be Covered

List of Topics	No. of Weeks	Contact hours
Anti-derivatives , the substitution method, the definite integral, the fundamental theorem of calculus and numerical integration	3	15
Logarithmic and exponential functions natural and general. Derivation and integration formulae. Inverse trigonometric and inverse hyperbolic functions, Derivation and integration formulae.	3	15
L'hopital's rule, integration by parts, trigonometric integrals, trigonometric substitutions, integrals of rational functions.	3	15

Miscellaneous substitutions, integrals involving quadratic functions, improper integrals.	1	5
Applications of integrals: areas of regions, volume by cylindrical shells and by washer method, surface area and arc length.	2	10
Parametric curves, polar coordinates and polar curves.	3	15

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

		Lecture	Tutorial	Laboratory/ Studio	Practical	Other:	Total
Contact Hours	Planed						
	Actual	45	30	0	0	0	75
Credit	Planed						
	Actual	3	1	0	0	0	4

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

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

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	• Recall the definition of indefinite and definite integrals • State the mean-value theorem and the fundamental theorem of calculus. • Define the natural logarithmic , natural exponential, general exponential and logarithmic functions, their derivation and integration formulae.	• At the beginning of studying each topic some examples will be laid out and discussed with the students encouraging them to discover the	Class discussions and quizzes.

		relevant concepts.	
		•	
1.2	Recognize the different techniques of integration(by parts, trigonometric integrals, partial fractions)	• At the beginning of each lecture a discussion is conducted with the students about what have been done in the previous lecture in order to establish a link with the current lecture	
1.3	• Recall formulae for calculating the area of a plane region, the volume of a solid of revolution, arc length and the area of a surface of revolution.		
1.4	• Recognize the different types of indeterminate forms and improper integrals. • Convert between polar and Cartesian coordinate systems. • Outline methods of finding the area of plane regions in polar coordinates.		
2.0	**Cognitive Skills**		
2.1	Evaluate indefinite and definite integrals	Homework assignments and discussions during lectures	
2.2	Solve problems involving the fundamental theorem of calculus and the mean value theorem	Problem sheets may be distributed and some of these problems solved during lectures	
2.3	Evaluate integrals using various methods of integration		
2.4	Test the convergence of improper integrals		
2.5	Find limits using L'Hopital's rule		
2.6	Calculate areas of plane regions		
2.7	Calculate volumes by the disk method and cylindrical shell method		
2.8	Find areas of plane regions in polar coordinates		
3.0	**Interpersonal Skills & Responsibility**		
3.1	Study, learn and work independently		
3.2	Work effectively in a team		
4.0	**Communication, Information Technology, Numerical**		
4.1	Present some of the topics studied to others both in oral and written form in a well organized manner		
4.2	Use IT facilities as an aid to mathematical processes and for acquiring available information		
5.0	**Psychomotor**		
5.1			

5.2			

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	First midterm exam	6	25%
2	Second midterm exam	12	25%
3	Final exam	16	40%
4	Quizzes	Every 3 weeks	10%
5			
6			
7			
8			

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) 10 office hours are available for students to get help. Academic counseling is also available.

E Learning Resources

1. List Required Textbooks Calculus by Swokowski and Pence(sixth edition)
2. List Essential References Materials (Journals, Reports, etc.) Anton,H Calculus with analytic geometry 2nd edtion , John Wiley, New York.
3. List Electronic Materials, Web Sites, Facebook, Twitter, etc. Various sites on the internet offer help on calculus subjects. Also some teaching videos of calculus are available
4. Other learning material such as computer-based programs/CD, professional standards or regulations and software. LMS course

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.) A classroom which accommodates 25 students equipped with the usual black board and smart board, with adequate ventilation and lighting.
2. Technology resources (AV, data show, Smart Board, software, etc.) Smart board is widely used by teachers and is available in all class rooms
3. Other resources (specify, e.g. if specific laboratory equipment is required, list requirements or attach list)

G Course Evaluation and Improvement Processes

1. Strategies for Obtaining Student Feedback on Effectiveness of Teaching Open discussions with students The evaluation of the course at the end of each semester by the students
2. Other Strategies for Evaluation of Teaching by the Instructor or by the Department • Peer evaluations • Meetings and discussions with peers about possible improvements
3. Processes for Improvement of Teaching • Discussions during lectures • Encouraging students to get involved during the lecture • Peer attendance of lectures and suggestions from peers
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) • Common exam for classes with many sections. • Marking some exams by different teachers
5. Describe the planning arrangements for periodically reviewing course effectiveness and planning for improvement. Periodic meetings of instructors to evaluate teaching effectiveness and discussions aiming at improving the effectiveness

Name of Course Instructor: _____Dr Houcine Sadraoui_____

Signature: _____ Date Specification Completed: _____24/2/2018_____

Program Coordinator: _____Dr Houcine Sadraoui_____

Signature: _____ Date Received: _____