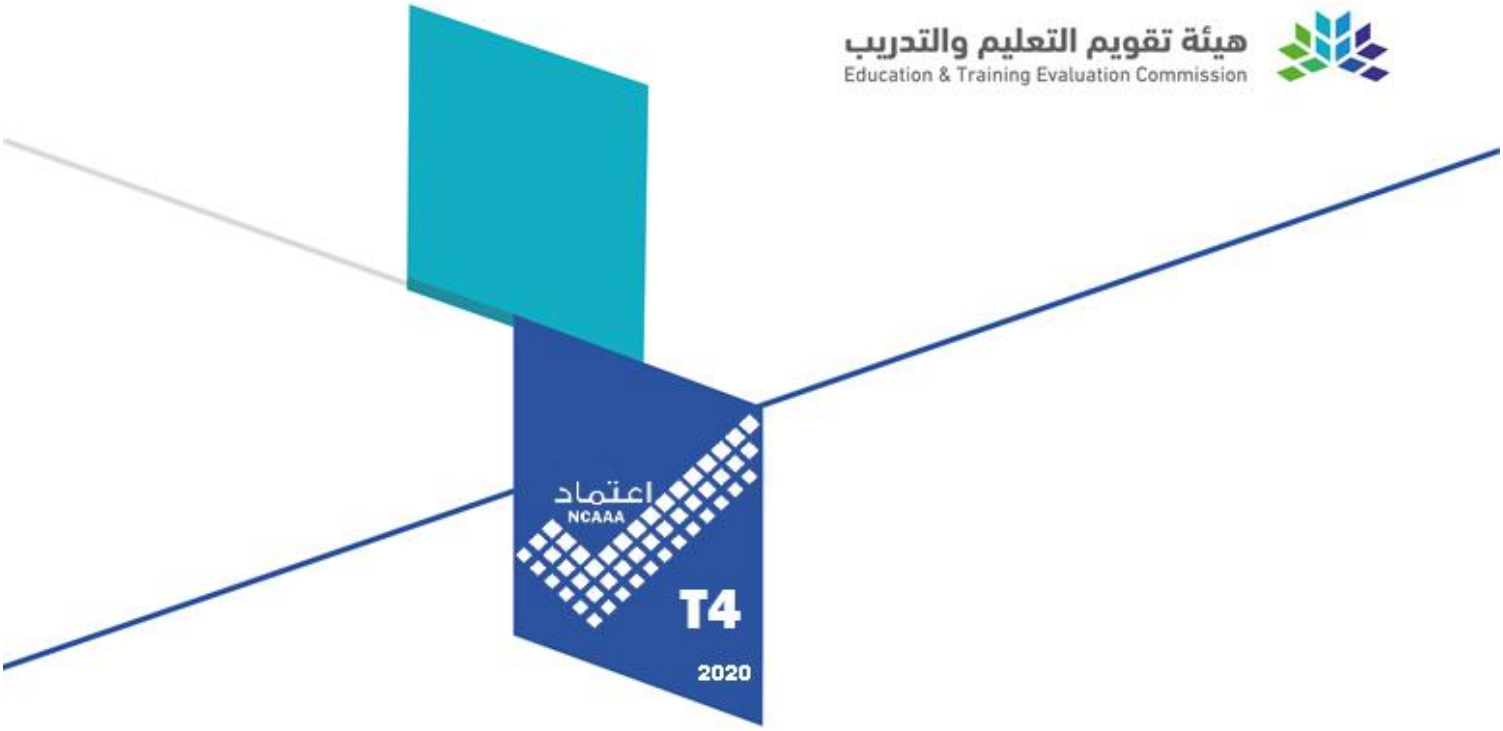
هيئة تقويم التعليم والتدريب
Education & Training Evaluation Commission



Course Specifications

Course Title:	**Calculus II**
Course Code:	**Mat224**
Program:	**CSI**
Department:	**CSI**
College:	**Science**
Institution:	**Majmaah University**

Table of Contents

A. Course Identification

1. Credit hours: **3 hours**
2. Course type **a.** University ☐ College ☐ **Department** ✓ Others ☐ **b.** **Required** ✓ Elective ☐
3. Level/year at which this course is offered: **3rd Level**
4. Pre-requisites for this course (if any)**:** **Calculus I**
5. Co-requisites for this course (if any)**:**

6. Mode of Instruction (mark all that apply)

No	Mode of Instruction	Contact Hours	Percentage
1	**Traditional classroom**		
2	**Blended**	**5**	**10%**
3	**E-learning**	**8**	**20%**
4	**Distance learning**	**32**	**70%**
5	**Other**		

7. Contact Hours (based on academic semester)

No	Activity	Contact Hours
1	**Lecture**	**30**
2	**Laboratory/Studio**	
3	**Tutorial**	**15**
4	**Others** (specify)	
	Total	**45**

B. Course Objectives and Learning Outcomes

1. Course Description

Recognize Definite Integral and its properties- Mean value theorem of integral.

Define The fundamental theorem of Calculus- Indefinite integrals- Standard integrals- Derivatives and Integrals of hyperbolic and inverse hyperbolic functions.

Reproduce and State Techniques of Integrations: Substitution method- Integration by Parts- Trigonometric Substitutions- Integrals involving Quadratics- Integration by Partial Fractions**. Describe** Convergence and Divergence of sequences and series- Taylor and Maclaurin series- Improper Integrals- Applications of Integration

2. Course Main Objective

Generally,

1- To enable the students to understand the concepts of Integration.

2- The course aims at providing the student with the proper knowledge, cognitive skills, interpersonal skills, responsibility, communication skills and use of information technology skills.

Specially, Study of main concepts of Integration as follows

1-Studying Definite integral and its properties.
2- Studying the mean value theorem of integral.
3- Studying the fundamental theorem of Calculus.
4- Having the knowledge of Indefinite integral and Standard integrals.
5- Having the knowledge of integrals of hyperbolic and inverse hyperbolic functions.
6- Having the knowledge of Integration technique.
7- Studying Convergence and Divergence of sequences and series.
8- Studying Taylor and McLaurin series.
9- Studying Improper Integrals.

3. Course Learning Outcomes

CLOs		Aligned PLOs
1	**Knowledge and Understanding**	
1.1	**Define** integration, fundamental theorem of calculus, mean value theorem, area under a curve.	
1.2	**Outline** the integration by parts and other method of integrations.	
1.3	**Enable** students to analyses the mathematical problems.	
1.4.	**Explain** and **interpret** a general knowledge of important mathematical concepts.	
2	**Skills :**	
2.1	**Illustrate** how to be communicating with: Peers, Lecturers and Community.	
2.2	**Interpret** how to Know the basic mathematical principles using the internet.	
2.3	**Appraise** how to Use the computer skills and library.	
2.4	**Illustrate** how to Search the internet and using software programs to deal with problems.	
3	**Values:**	
3.1	Illustrate how take up responsibility.	
3.2	Must be shown the ability of working independently and with groups.	
3.3	Students can actively and critically participate in class activities;	
3.4	Illustrate how take up responsibility.	

C. Course Content

No	List of Topics	Contact Hours
1	Definite Integral and its properties. Mean value theorem of integral. The fundamental theorem of Calculus.	**6**

2	Indefinite integrals - Standard integrals - Derivatives and Integrals of hyperbolic and inverse hyperbolic functions.	**6**
3	Techniques of Integrations: Substitution method- Integration by Parts- Trigonometric Substitutions.	**10**
4	Techniques of Integrations: Integrals involving Quadratics- Integration by Partial Fractions	**11**
5	Convergence and Divergence of sequences and series- Taylor and McLaurin series. Improper Integrals	**6**
6	Applications of Integration. Calculating areas and volumes using definite integration.	**6**
Total		**45**

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	**Define** integration, fundamental theorem of calculus, mean value theorem, area under a curve.	Start each chapter by general idea and the benefit of it.	Quizzes Midterms Final examination.
1.2	**Outline** the integration by parts and other method of integrations.	**Demonstrate** the course information and principles through lectures.	Home work.
1.3	**Enable** students to analyses the mathematical problems.	**Provide** main ways to deal with the exercises.	Continuous discussions with the students during the lectures.
1.4.	**Explain** and **interpret** a general knowledge of important mathematical concepts.	**Provide** main ways to deal with the exercises.	Continuous discussions with the students during the lectures.
2.0	**Skills**		
2.1	**Illustrate** how to be communicating with: Peers, Lecturers and Community.	Ask the students to search the internet and use the library.	Quizzes of some previous lectures. Ask the absent students about last lecture.
2.2	**Interpret** how to Know the basic mathematical principles using the internet.	Teach them how to cover missed lectures. Give students tasks of duties	Discussion during the lecture.
2.3	**Appraise** how to Use the computer skills and library.	Encourage them how to attend lectures regularly by assigning marks for attendance.	Quizzes
2.4	**Illustrate** how to Search the internet and using software programs to deal with problems.	Ask the students to search the internet and use the library.	Quizzes of some previous lectures. Ask the absent students about last lecture

Code	Course Learning Outcomes	Teaching Strategies	Assessment Methods
3.0	**Values**		
3.1	Illustrate how take up responsibility.	Creating working groups with peers to collectively prepare: solving problems and search the internet for some topics.	Discussing a group work sheets.
3.2	Must be shown the ability of working independently and with groups.	Give the students tasks to measure their: mathematical skills, computational analysis and problem solving.	Discuses with them the results of computations analysis and problem solutions.
3.3	Students can actively and critically participate in class activities;	Encourage the student to ask for help if needed.	Give homework's to know how the student understands the numerical skills.
3.4	Illustrate how take up responsibility.	Encourage the student to ask good question to help solve the problem.	Give them comments on some resulting numbers.

2. Assessment Tasks for Students

#	Assessment task*	Week Due	Percentage of Total Assessment Score
1	**Midterm Exam 1**	**6th**	**20**
2	**Midterm Exam 2**	**11th**	**20**
3	**Homework + Presentation**	**During semester**	**10**
4	**Quizzes**	**4th - 9th**	**10**
5	**Final Examination**	**16th**	**40**
6		**Total**	**100**

***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 :

1- Two - office hours per week in the lecturer schedule.

2- The contact with students by e-mail and website (Blackboard- system).

F. Learning Resources and Facilities

1. Learning Resources

Required Textbooks	R. Smith and R. Minton, Calculus: Early Transcendental Functions, Mc Graw Hill, 2012.
Essential References Materials	2-George B. Thomas, Ross L. Finney, Calculus and analytical Geometry (9th Edition), Addison-Wesley publishing company, 1996.
Electronic Materials	• http://WWW.cmi.univ-mrs.fr// • http://WWW.arxiv.org// • http://WWW.Ims.ac.u//

Other Learning Materials	

2. Facilities Required

Item	Resources
Accommodation (Classrooms, laboratories, demonstration rooms/labs, etc.)	• Lecture room with speakers and internet access. • Classroom with capacity of 20-students. • Library
Technology Resources (AV, data show, Smart Board, software, etc.)	• Desktop or laptop with internet facility • Data show to facilitate going over students' papers in class
Other Resources (Specify, e.g. if specific laboratory equipment is required, list requirements or attach a list)	

G. Course Quality Evaluation

Evaluation Areas/Issues	Evaluators	Evaluation Methods
Effectiveness of teaching and assessment	Peer Reviewer	Direct
Quality of learning resources	Peer Reviewer	Direct
Extent of achievement of course learning outcomes	Peer Reviewer	Direct
Course Evaluation	Student	Indirect

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	
Reference No.	
Date