اعتماد
NCAAA

T4

2020

Course Specifications

Course Title:	Calculus II
Course Code:	2022104-4
Program:	Bachelor in Mathematics.
Department:	Mathematics and Statistics Department
College:	Faculty of sciences
Institution:	Taif university

Table of Contents

A. Course Identification

1. Credit hours: **(4)**
2. Course type
a. University ☐ College ☐ Department √ Others ☐
b. Required √ Elective ☐
3. Level/year at which this course is offered: 4th level / 2th year
4. Pre-requisites for this course (if any)**:** Calculus I (**2021204-4**)
5. Co-requisites for this course (if any)**:** None

3. Level/year at which this course is offered: 4th level / 2th year

6. Mode of Instruction (mark all that apply)

No	Mode of Instruction	Contact Hours	Percentage
1	**Traditional classroom**	**5Hr /Week**	100
2	**Blended**		
3	**E-learning**		
4	**Distance learning**		
5	**Other**		

7. Contact Hours (based on academic semester)

No	Activity	Contact Hours
1	**Lecture**	50
2	**Laboratory/Studio**	
3	**Tutorial**	
4	**Others** (specify)	
	Total	50

B. Course Objectives and Learning Outcomes

1. Course Description

This course covers basics of calculus and how they can use to solve several problems. The course focus The Fundamental Theorem of Calculus, The Indefinite Integrals and The Net Change Theorem, studying most known techniques of integration (The Substitution Rule, Trigonometric Integrals, Integration by Parts, Trigonometric Substitution and Integration of Rational Functions by Partial Fractions). Improper integrals and applications of integration (Area Between Curves and Volume and, Volumes by Cylindrical Shells and Average Value of a Function and Arc Length of Curves). The course focuses also on the link between theory and practice.

2. Course Main Objective

The student will be taught as follows:

1. Understanding the elementary theorems and properties of Integral Calculus such as The Definite Integral, Fundamental Theorem of Calculus, Indefinite Integrals and The Net Change Theorem. And recognizing the Substitution Rule, Application of Integration (Area Between Curves, Volumes, Volumes by Cylindrical Shells, Average

Value of a Function).

2. Applying the Techniques of Integration (Integration by Parts, Trigonometric Integrals, Trigonometric Substitution, and Integration of Rational Functions by Partial Fractions) and Illustrating the Applications of Integration (Area of a Surface Revolution, Applications to Physics and Engineering, Applications to Economics and Biology.

3. Course Learning Outcomes

	CLOs	Aligned PLOs
1	**Knowledge and Understanding:**	
1.1	Memorize the Definite Integral Rules and the Fundamental Theorem of Calculus.	K1
1.2	Outline the rate of convergence and complexity requirements of various optimization algorithms.	K1
2	**Skills:**	
2.1	Evaluate anti-derivatives, indefinite and definite integrals of elementary functions.	S2
2.2	Calculate definite integrals for computing areas, volumes and length	S2
3	**Values:**	
3.1	Realize the professional and ethical responsibility in conducting their work	V3

C. Course Content

No	List of Topics	Contact Hours
1	The Definite Integral and The Fundamental Theorem of Calculus and the Indefinite Integrals and The Net Change Theorem	5
2	Techniques of Integration (The Substitution Rule).	5
3	Techniques of Integration (Trigonometric Integrals) and Techniques of Integration (Trigonometric Substitution).	5
4	Techniques of Integration (Integration of Rational Functions by Partial Fractions)	5
5	Techniques of Integration (Integration by Parts).	5
6	**Midterm exam,** Improper Integrals, and application of Integration (Area Between Curves and Volumes)	5
7	Application of Integration (Volumes by Cylindrical Shells and Average Value of a Function	5
8	Further Applications of Integration (Arc Length of Curves).	5
9	Further Applications of Integration (Area of a Surface Revolution)	5
10	Further Applications of Integration (Applications to Physics and Engineering, Applications to Economics and Biology).	5
	Total	50

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	<u>Memorize</u> the Definite Integral Rules and the Fundamental Theorem of Calculus.	• Lectures • Group discussions	• Quizzes Assignments
1.2	<u>Outline</u> the rate of convergence and complexity requirements of various optimization algorithms.	• Lectures • Group discussions	• Exams • Assignments
2.0	**Skills**		
2.1	<u>Evaluate</u> anti-derivatives, indefinite and definite integrals of elementary functions.	• Interactive classes Group discussions	• Quizzes Assignments
2.2	<u>Calculate</u> definite integrals for computing areas, volumes and length	• Lectures • Group discussions	• Exams • Quizzes
3.0	**Values**		
3.1	<u>Realize</u> the professional and ethical responsibility in conducting their work	• Lecture.	Quizzes Assignments

2. Assessment Tasks for Students

#	Assessment task*	Week Due	Percentage of Total Assessment Score
1	**Quizzes + Home works**	**Continues**	**10 %**
2	**Midterm exam**	**5th-6th**	**30 %**
3	**Class Work (Homework- report- class test….)**	**8th**	**10 %**
4	**Final exam**	**11th**	**50 %**

*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:

6 hours per week (as defined in the teaching schedule of the faculty member) for academic advice and consultations.
Teaching staff is also available using Blackboard web site and Taif University "Edugate" System.

F. Learning Resources and Facilities
1.Learning Resources

Required Textbooks	H. Anton, I. Bivens and S. Davis, (2010), Calculus: Early Transcendentals, International Student Version, 10th Edition, USA, John Wiley & Sons, Inc.
Essential References Materials	J. Stewart, (2012), Calculus: Early Transcendentals,7th edition, USA, Brooks/Cole.

Electronic Materials	https://www.abebooks.com/book-search/title/calculus-early-transcendentals-7th-edition/author/james-stewart/
Other Learning Materials	**Black Board**

2. Facilities Required

Item	Resources
Accommodation (Classrooms, laboratories, demonstration rooms/labs, etc.)	**Lecture halls, containing white boards, and electronic monitors - The seats fit the number of students - Laboratories equipped with suitable numbers of computers**
Technology Resources (AV, data show, Smart Board, software, etc.)	**Data show and smart board**
Other Resources (Specify, e.g., if specific laboratory equipment is required, list requirements or attach a list)	**Wi-Fi internet connections and Black Board**

G. Course Quality Evaluation

Evaluation Areas/Issues	Evaluators	Evaluation Methods
Effectiveness of teaching and assessment	Students	Indirect
Quality of learning resources	Peer Reviewer Students	Direct Indirect
Extent of achieving the course learning outcomes	Peer Reviewer Students	Direct 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	Department of Mathematics and Statistics
Reference No.	11
Date	12-7-1443 H

قسم الرياضيات والإحصاء
Mathematics and Statistics Department

جامعة الطائف
TAIF UNIVERSITY