

# Course Specifications

Course Title:	Integration and Differential Equations
Course Code:	114 Math-3
Program:	Bachelor of Science
Department:	Mathematics
College:	Art & Sciences
Institution:	Najran University

## Table of Contents

A. Course Identification.....	3
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6. Mode of Instruction (mark all that apply) .....	3
<b>B. Course Objectives and Learning Outcomes.....</b>	<b>4</b>
1. Course Description .....	4
2. Course Main Objective.....	4
3. Course Learning Outcomes .....	4
<b>C. Course Content.....</b>	<b>4</b>
<b>D. Teaching and Assessment .....</b>	<b>5</b>
1. Alignment of Course Learning Outcomes with Teaching Strategies and Assessment Methods.....	5
2. Assessment Tasks for Students .....	5
<b>E. Student Academic Counseling and Support .....</b>	<b>6</b>
<b>F. Learning Resources and Facilities.....</b>	<b>6</b>
1. Learning Resources .....	6
2. Facilities Required.....	6
<b>G. Course Quality Evaluation .....</b>	<b>7</b>
<b>H. Specification Approval Data .....</b>	<b>7</b>

## A. Course Identification

1. Credit hours: 3
2. Course type
a. University <input type="checkbox"/> College <input type="checkbox"/> Department <input checked="" type="checkbox"/> Others <input type="checkbox"/>
b. Required <input checked="" type="checkbox"/> Elective <input type="checkbox"/>
3. Level/year at which this course is offered: First Level
4. Pre-requisites for this course (if any): 101math-4
5. Co-requisites for this course (if any): none

## 6. Mode of Instruction (mark all that apply)

No	Mode of Instruction	Contact Hours	Percentage
1	Traditional classroom	3	100%
2	Blended		
3	E-learning		
4	Correspondence		
5	Other		

## 7. Actual Learning Hours (based on academic semester)

No	Activity	Learning Hours
<b>Contact Hours</b>		
1	Lecture	45
2	Laboratory/Studio	
3	Tutorial	15
4	Others (specify)	
	<b>Total</b>	60
<b>Other Learning Hours*</b>		
1	Study	30
2	Assignments	10
3	Library	10
4	Projects/Research Essays/Theses	
5	Others (o.h)	15
	<b>Total</b>	125

\* The length of time that a learner takes to complete learning activities that lead to achievement of course learning outcomes, such as study time, homework assignments, projects, preparing presentations, library times



## B. Course Objectives and Learning Outcomes

### 1. Course Description

- Students know the concept of the inverse operation of the differential derivative or the so-called integration and how to calculate the integration in different ways.
- Identify the geometric meaning of the specified integration and its various applications from calculating the lengths of the curves and finding areas.
- Students know the type of equations that depend on differentiation and integration, which are differential equations and assimilation of the students' methods of solving differential equations of different kinds.
- Identify the sequences and how to use different tests to study the convergence or spacing of these sequences

### 2. Course Main Objective

Students are expected to have strong and sound understanding of the integration calculus in term of its concepts, techniques and theorems. Students are expected to apply them on studying the differential equations.

### 3. Course Learning Outcomes

CLOs		Aligned PLOs
1	<b>Knowledge:</b>	
1.1	define the definite and indefinite integrals.	
1.2	understanding how to classify, formulate and solve the differential equation.	
1.3	understanding convergence and divergence of some series	
1...		
2	<b>Skills :</b>	
2.1	Identify the appropriate way to find an integration	
2.2	Classify the differential equation and distinguish between methods of solution	
2.3	describe the relationship between convergence and absolute convergence of the series	
3	<b>Competence:</b>	
3.1	promoting free, creative and critical thinking.	
3.2	working independently.	
3.3	searching for data and information and analyzing them.	
3.4		
3.5		

## C. Course Content

No	List of Topics	Contact Hours
	The original function - the presence of the original function (unspecified integration) - basic integrals	3
	Methods of integration (fractional integration - compensation integration - trigonometric and hyperbolic compensation - complete square	٦
	Integration of relative functions (partial fractions) - integration of non - relative functions	٦



Specific Integration - Algebraic Properties of Specific Integration - Some Applications of Specific Integration (Finding Bracket Lengths - Finding Area Under the Curve - Finding Area Between Two Curves)	٦
Classification of differential equation - Rank and grade - Concept of solution - Composition of differential equation - Separation of variables	٦
Homogeneous and nonhomogeneous differential equations	٦
Exact and not exact differential equations - Linear differential equations	٦
Linear differential equations with constant coefficients of the second order	٣
Series - Convergence tests - Absolute convergence	٣
<b>Total</b>	<b>45</b>

## D. Teaching and Assessment

### 1. Alignment of Course Learning Outcomes with Teaching Strategies and Assessment Methods

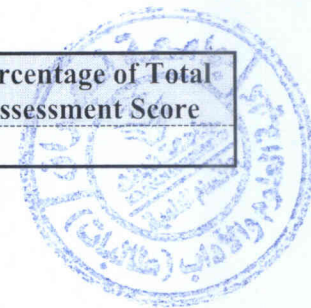
Code	Course Learning Outcomes	Teaching Strategies	Assessment Methods
<b>1</b>	<b>Knowledge:</b>		
1.1	define the definite and indefinite integrals.	Lecture Cooperative learning Problem solving	Final Exam
1.2	understanding how to classify, formulate and solve the differential equation.		
1.3	understanding convergence and divergence of some series		
1...			
<b>2</b>	<b>Skills :</b>		
2.1	Identify the appropriate way to find an integration	-Lecture -Cooperative learning -Problem solving	Observation Final Exam
2.2	Classify the differential equation and distinguish between methods of solution		
2.3	describe the relationship between convergence and absolute convergence of the series		
<b>3</b>	<b>Competence:</b>		
3.1	promoting free, creative and critical thinking.	Brain storming Self-Learning	Final Exam
3.2	working independently.		
3.3	searching for data and information and analyzing them.		
3.4			
3.5			

### 2. Assessment Tasks for Students

#	Assessment task*	Week Due	Percentage of Total Assessment Score
1	1 <sup>st</sup> midterm Exam	7 <sup>th</sup> week	20
2	2 <sup>nd</sup> midterm Exam	11 <sup>TH</sup> week	20
3	Assignments & Quizzes	During classes	10
4	Final Exam	At the end	50

#	Assessment task*	Week Due	Percentage of Total Assessment Score
8			

\*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 :

- Office Hours
- Blackboard

## F. Learning Resources and Facilities

### 1. Learning Resources

Required Textbooks	<p>١- تطبيقات في حساب التفاضل والتكامل ، ابراهيم سرميني وآخرون ، جامعة الملك سعود</p> <p>٢- مبادئ المعادلات التفاضلية ، عبد المجيد نصير</p>
Essential References Materials	<p>1- Calculus with analytic geometry , 4<sup>th</sup> ed . John Wiley &amp; Sons , New York 1992.</p> <p>2- W . E . Boyce and R . C . DiPrima.( Elementary Differential Equations ) John Wiley New York</p> <p>3- S . Ross ( Ordinary Differential Equations ) John Wiley and Sons N .</p>
Electronic Materials	<a href="http://www.math.math.com">http://www.math.math.com</a>
Other Learning Materials	

### 2. Facilities Required

Item	Resources
<b>Accommodation</b> (Classrooms, laboratories, demonstration rooms/labs, etc.)	Classroom
<b>Technology Resources</b> (AV, data show, Smart Board, software, etc.)	<ul style="list-style-type: none"> <li>- Data Show</li> <li>- Free software as :</li> </ul>



Item	Resources
	Matlab Mathematica
<b>Other Resources</b> (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	Students	Questioner (Indirect)
achievement of course learning outcomes	Lecturer	Software (Direct)
Quality of learning resources	all	Questioner (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	