Future Academy
Higher Future Institute for Specialized Technological Studies

Course Specification

1- Course information:	
Course Code:	BSC201
Course Title:	Mathematics (2)
Year/level	2nd
Academic Programs	Computer Science Program (B.Sc.)
Contact hours/ week	(Theoretical= 2hrs / Tutorial=2hrs), Total= 4hrs

2- Course aims:

This course aims to provide a firm foundation of the concepts of calculus mainly integrations and its application especially how to calculate areas and volumes of bounded regions. Studying the behavior of infinite sequences add more skills to how to deal with data.

3- Intended learning outcomes of the course (ILOs):

a- Knowledge and understanding:

On successful completion of this course, the student should be able to:
a1. provide firm foundation in the concepts and techniques of calculus.
a2. provide good knowledge of integrable one variable functions.
a3. general understanding of major concepts and approaches in mathematics.
a4. evaluate and manipulate integration.

Intellectual skills:

On completing this course, the student should be able to:
b1. choose the suitable approach to solve mathematical problems .
b2. develop a general appreciation of the goals, subareas, achievements and difficulties of the problem.
b3. use mathematical and intellectual skills.
b4. apply the basic skills of integration for calculating areas and volumes of complicated regions.

c- Professional and practical skills:

At the end of this course, the student will be able to:
c1. introduce best techniques for solving integral problems.
c2. introduce best techniques for applying integration methods.
c3. introduce good analysis for studying the behavior of infinite sequences.

d- General and transferable skills:

On successful completion of this course, the student should be able to:

d1. demonstrate suitable numeracy abilities while understanding and explaining situations with a quantitative component.

d2. work effectively both in team and independently.

d3. use internet and electronic library.

4- Course contents

Week No.	Topics/units	Number of hours		ILO's
		Lecture hours	Tutorial hours	
1	introduction to calculus	2	2	a1, a2, a3, b1, b2, b3, c1,c2, c3, d1, d2, d3
2	summation, notation, riemann summation	2	2	a4,b4,c2,d3
3	antiderivatives	2	2	a1, a2, b2, b3,c1,d2, d3
4	basic rules of integrations, & q1	2	2	a1, a4, b2, b4,c1,d2, d3
5	indefinite integral change variables	2	2	a1,b3,c1,d3
6	properties of definite integral	2	2	a1,b2, c2,d1
7	midterm exam	2	2	a1, a2 , a4 b1, b2, b3,c1, c2 d2, d3
8	application of the definite integral, area, volume by cylindrical shells	2	2	a1,b1,c1,d1
9	application of the definite integral, volume by cross sections			a1, a2 , a4, b1, b2, b3,c1, c2 d2, d3
10	integration of trigonometric functions	2	2	a3,b3,c1,d1
11	integration by substitution + quiz 2	2	2	a1, a2 , a4 , b1, b2, b3,c1, c2 d2, d3
12	integration by parts and integration of rational functions	2	2	a1, a2, a3,b2, b3,c1, c2,d2, d3
13	numerical integration & application of definite integrals	2	2	a1, a2, b2, b3 , c1, c2, d1, d3
14	functions of several variables	2	2	a1, a2 b1, c2 , d1,d2

4- teaching and learning methods

Methods	ILO's																			
	a1	a2	a3	a4	a5	b1	b2	b3	b4	b5	c1	c2	c3	c4	c5	d1	d2	d3	d4	d5
Lectures	√	√	√	√		√	√	√	√		√	√	√			√	√	√		

Tutorial / Practical sections	√					√						√				√			
Self-learning	√					√						√				√			
Assays and reviews																			
Discussion groups	√					√					√						√		
Brainstorming	√						√					√				√			
Blended-learning																			
E-learning																			

5- Teaching and learning methods for Low-achieving students

- Extra teaching hours for those who need help
- More quizzes to assess their ability for understanding the course
- Encourage the team work for those students with other advanced ones to increase their participation and understanding

6- Student assessment

Assessment method	Time	Grade weight (%)	Week	ILOs
Course Work (Tutorial Exercise and Assignments)	Every week	15	Every week	a1, a2, b1, b2, b3, c1, c2, d1, d2
Quiz 1	1	5	Week#4	a1, a2 , b2, b3,c1,d2, d3
Mid-term exam	2	15	Week#7	a1, a2 , b2, b3,c1,d2, d3
Quiz 2	1	5	Week#11	a1, a2, b2, b3, c1,d2, d3
Final Written exam		60		a1, a2, b2, b3, c1,d2, d3

7-List of references

8.1. Student notebooks:

- Comprehensive instructor notes are available on the course web page (google Classroom).

8.2. Essential textbooks: Calculus, Stokowski, Fifth Edition, 1991**.**

8.3. Recommended textbooks:

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8.4. Journals, Periodical and Reports ……..etc.

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8.5. Websites

- **https://www.wolfram.com/wolfram-u/courses/mathematics/introduction-to-calculus**
- **https://centerofmath.com/**

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