Future Academy
Higher Future Institute for Specialized Technological Studies

Course Specification

1- Course information:	
Course Code:	BSC101
Course Title:	Calculus
Year/level	1st
Academic Programs	Computer Science Program (B.Sc.)
Contact hours/ week	(Theoretical= 2hrs / Tutorial = 2hrs), Total= 4hrs

2- Course aims:

This course aims to provide students with the basic concepts of Calculus, Prepare a graduate who is able to recognize the importance and possess the problem-solving skills that are necessary for life-long learning.

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

a- Knowledge and understanding:

On successful completion of this course, the student should be able to:
a-1 recognize the fundamental ideas, facts of calculus
a-2 understand the methods, procedures, and tools used in calculus
a-3 comprehend the fundamentals of calculus as it is related to the field of computer science.

b- Intellectual skills:

On completing this course, the student should be able to:
b-1 realize and evaluate the ideas, principles, theories, and methods of mathematics
b.2 classify the different scientific approaches (methods, methodologies and algorithms).
b-3 interpret characteristics, elements, connections, trends, primary concepts, and faults.

c- Professional and practical skills:

At the end of this course, the student will be able to:
c-1 apply knowledge and understanding of computing and mathematics to projects to solve real-world issues.
c-2 identify the required mathematical methods to the solution of the calculus problems.

d- General and transferable skills:

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

d-1 display the skills necessary to manage one's learning and to use a variety of learning resources
d-2 demonstrate suitable numeracy abilities while understanding and explaining situations with a quantitative component.
d-3 use information effectively.

4- Course contents

Week No.	Topics/units	Number of hours		ILO's
		Lecture hours	Tutorial hours	
1	Sets & Functions	2	2	a1,b2, c1,d1
2	Inverse of function	2	2	a3,b3, c2,d3
3	Limits & Continuity	2	2	a1, a2 , b2, b3,c1,d2, d3
4	Introduction to derivatives+ Quiz 1	2	2	a1, a2, b2, b3,c1,d2, d3
5	Techniques Of differentiation	2	2	a1,b3, c1,d3
6	Application on derivative	2	2	a1,b2, c2,d1
7	Midterm Exam	2	2	a1, a2, b2, b3,c1,d2, d3
8	Integration	2	2	a1,b1, c1,d1
9	Integration of trigonometric functions	2	2	a3,b3, c1,d1
10	Integration by substitution	2	2	a3,b2, c2,d2
11	Integration by parts+ Quiz 2	2	2	a1, a2, a3,b2, b3,c1, c2, d2, d3
12	Integration of rational functions	2	2	a1,b3, c1,d1
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

5- 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	√															√				

6- 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

7- 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

8-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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