QF04/0408-4.0E	Course Plan for Bachelor program - Study Plan Development and Updating Procedures/ Department of Basic Sciences

Study plan No.	**2024/2025**		**University Specialization**		**Bachelor of Mathematics**	
Course No.	**0420801**		**Course name**		**Calculus 1 for eng.**	
Credit Hours	**3**		**Prerequisite/ Co-requisite**		**None**	
Course type	☐ MANDATORY UNIVERSITY REQUIREMENT	☐ UNIVERSITY ELECTIVE REQUIREMENTS	✓ **FACULTY MANDATORY REQUIREMENT**	☐ Support course family requirements	☐ Mandatory requirements	☐ Elective requirements
Teaching style	☐ Full online learning		☐ Blended learning		✓ **Traditional learning**	
Teaching model	☐ 1 Synchronous: 1 asynchronous		☐ 1 face to face : 1 asynchronous		✓ **2 Traditional**	

Faculty member and study divisions' information (to be filled in each semester by the subject instructor)

Name	Academic rank	Office No.	Phone No.	E-mail	
Division number	**Time**	**Place**	**Number of students**	**Teaching style**	**Approved model**

Brief description

Functions types (polynomials, rational functions, piecewise functions, trigonometric functions, exponential and logarithmic functions), Limits, Continuity, The derivative, Chain rule, Implicit differentiation, Applications of derivative, Finite integration, Infinite integration.

Learning resources

Course book information (Title, author, date of issue, publisher ... etc)	Calculus, 10th edition By Howard Anton, Irl Bivens and Stephen Davis.
Supportive learning resources (Books, databases, periodicals, software, applications, others)	1. Calculus, 8th Edition Publisher: Cengage Learning 2016, by James Stewart. 2. Calculus, by Salas and Hille, 10th Ed, 2011. 3. Calculus Learning by James Stewart, 7th Ed, 2012 4.Thomas' Calculus ,14th Ed , 2011
Supporting websites	• Calculus at S.O.S. Mathematics • http://www.sosmath.com/calculus/calculus.html • Visual Calculus; tutorials and demos • http://archives.math.utk.edu/visual.calculus/index.html • Calculus online • http://www.ugrad.math.ubc.ca/coursedoc/math100/index.html • Online tutorials and quizzes • http://www.math.hmc.edu/calculus/tutorials/

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The physical environment for teaching	✓ Class room	☐ labs	☐ Virtual educational platform	☐ Others
Necessary equipment and software				
Supporting people with special needs				
For technical support				

Course learning outcomes (S= *Skills, C= Competences K= Knowledge,)*

No.	Course learning outcomes	The associated program learning output code
	Knowledge	
K1	Concept of functions (algebraic and transcendental).	**MK 2**
K2	Demonstrating the relation between some functions like the exponential and logarithmic functions.	**MK 2**
K3	Concept of limits of a function.	**MK 2**
K4	Demonstrating the concept of limits at infinity	**MK 2**
K5	Demonstrating knowledge about the idea of continuity of a function	**MK 2**
K6	Concept of differentiating	**MK 2**
	Skills	
S1	Graphing of functions and determining their domain and range.	**MS 4**
S2	Applying derivatives to graph functions and to solve certain optimization problems	**MS 4**
	Competences	
C1	Cooperate to work effectively in the group assignments.	**MC 1**

Mechanisms for direct evaluation of learning outcomes

Type of assessment / learning style	Fully electronic learning	Blended learning	Traditional Learning (Theory Learning)	Traditional Learning (Practical Learning)
Mid exam	30%	30%	**30%**	30%
Participation / practical applications	0	0	**30%**	30%
Asynchronous interactive activities	30%	30%	**0**	0
Final exam	40%	40%	**40%**	40%

Schedule of simultaneous / face-to-face encounters and their topics

Week	Subject	learning style	Reference
1	Introduction to Functions, Types of Functions, properties of essential functions, Equation of line	Lecture 1+2	1-16
2	Domain and Range of functions, Absolute Value. Functions Sum, Differences, Product, and Quotient of functions.	Lecture 3 +4	17 – 27
3	Composition of functions. Even and Odd Function,	Lecture 5+6	28 – 40

	Trigonometric Functions.		
4	Logarithmic Equations .Shifting Graphs of functions. Stretching and compression	Lecture 7+8	40 - 51
5	Informal Definition. Right-Hand and Left-Hand Limits. Two – Sided Limits. Properties.	Lecture 9 +10	84 – 105
6	Limits of Polynomials and Rationals. Limits Involving Infinity.	Lecture 11 +12	105 – 125
7	The Sandwich Theorem. Limits of Trigonometric Functions Vertical and horizontal asymptotes.	Lecture 13+14	125 – 137
8	Informal Definition for limits. Continuity of Polynomials and Rationals..Some Properties **Mid Exam**	Lecture 15+16	137 – 146
9	Composites of Continuous Functions. Removable discontinuities. The Intermediate Value Theorem. Slopes and Tangent Lines	Lecture 17+18	146 – 171
10	Definition of Derivative. Rules of Differentiation. Higher Order Derivatives.	Lecture 19+20	171 – 206
11	Derivatives of Trigonometric.	Lecture 21+22	225 – 245
12	The Chain Rule.	Lecture 23+24	225 – 245
13	Implicit Differentiation .	Lecture 25+26	245 - 276
14	The second Derivative Test for concavity. Points of Inflection. Graph of functions	Lecture 27+28	276 - 281
15	Rolle's Theorm, Mean value Theorem	Lecture 29+30	281 – 289
16	**Final Exam**		