

QF01/0408-4.0E	Course Plan for Bachelor program - Study Plan Development and Updating Procedures/ Mathematics Department
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Study plan No.	2021/2022	University Specialization	Bachelor of Mathematics			
Course No.	0101101	Course name	Calculus 1			
Credit Hours	3	Prerequisite/ Co-requisite	None			
Course type	<input type="checkbox"/> MANDATORY UNIVERSITY REQUIREMENT	<input type="checkbox"/> UNIVERSITY ELECTIVE REQUIREMENTS	<input checked="" type="checkbox"/> FACULTY MANDATORY REQUIREMENT	<input type="checkbox"/> Support course family requirements	<input type="checkbox"/> Mandatory requirements	<input type="checkbox"/> Elective requirements
Teaching style	<input type="checkbox"/> Full online learning		<input type="checkbox"/> Blended learning		<input checked="" type="checkbox"/> Traditional learning	
Teaching model	<input type="checkbox"/> 1 Synchronous: 1 asynchronous		<input type="checkbox"/> 1 face to face : 1 asynchronous		<input checked="" type="checkbox"/> 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, 10 th 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	<ul style="list-style-type: none"> • 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/ 				
The physical environment for teaching	<input checked="" type="checkbox"/> Class room	<input type="checkbox"/> labs	<input type="checkbox"/> Virtual educational platform	<input type="checkbox"/> Others	

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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	Justify the Concept of functions (algebraic and transcendental).	MK 2
K2	Identify the relation between some functions like the exponential and logarithmic functions.	MK 2
K3	Recognize the Concept of limits of a function.	MK 2
K4	Recognize the concept of limits at infinity	MK 2
K5	Describe the idea of continuity of a function	MK 2
K6	Identify the Concept of differentiating	MK 2
Skills		
S1	Sketch the basic functions.	MS 4
S2	Determine the domain and range of basic functions	MS 4
S3	Calculate limits of algebraic functions.	MS 4
S4	Calculate the derivative of a function.	MS 4
S5	Apply derivatives to graph functions and to solve certain optimization problems	MS 4
Competences		
C1	Cooperate to work effectively in the group assignments.	MC 1
C2	Develop the individual's ability to communicate and interact with other mathematical courses.	MC 2

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	20%	30%
Asynchronous interactive activities	30%	30%	0	0
Final exam	40%	40%	50%	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

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3	Composition of functions. Even and Odd Function, Trigonometric Functions.	Lecture 5+6	28 – 40
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. The Chain Rule.	Lecture 21+22	225 – 245
12	Implicit Differentiation. The second Derivative Test for concavity	Lecture 23+24	245 - 276
13	Points of Inflection. Graph of functions	Lecture 25+26	276 - 281
14	Rolle's Theorm, Mean value Theorem. Indefinite integral	Lecture 27+28	281 – 289 322-332
15	Substitution method. Definite integral	Lecture 29+30	332-362
16	Final Exam		