Course Descriptor
FPPM002 GFP Pure Mathematics

جـامـعـة الشـرقـيـة
A' SHARQIYAH UNIVERSITY

ACADEMIC YEAR	2018-19		
Course Code & Title	FPPM002 - Pure Mathematics		
Credit hours	0	**Level of study**	Foundation
College / Centre	Centre for Language & Foundation Studies		
Co-requisites		**Pre-requisites**	

1. COURSE OUTLINE

Pure Math course covers Properties of Functions and their Graphs, Use of functions to model real world situations, Exponential and Logarithmic Functions, inverse relationship between them, Graphical, Geometric and Algebraic properties of the Trigonometric Functions. It also includes Basic concepts on Statistics and Probability.]

2. AIMS

[This course aims to ensure that students are equipped with the mathematical background, knowledge and skills necessary to meet the cognitive and practical requirements of higher education studies in Engineering, Applied Sciences and in a variety of academic discipline where mathematics plays a vital role.]

3. LEARNING OUTCOMES, TEACHING, LEARNING and ASSESSMENT METHODS

Learning Outcomes *(Definitive)* Upon successful completion of this course, students will be able to**:**	Teaching and Learning methods *(Indicative)*	Assessment *(Indicative)*
1. Describe the function and its graph.	**Lectures:-** Define and explain the concept of function through various real life examples. Domain and Range of functions, Three types of Symmetry. **Board Demonstration**:- Venn diagram, Machine diagram, Graphs of different functions, Table of Different types of symmetry. **Problem Solving Session:-** 1.1, 1.2, 1.3 Exercises Questions. **Group work**:- Work sheet **Self Study :-**Home work and assignment	Quiz 1 Mid-Term Test, Final Exam, Class Works and Home Works.
2. Define and manipulate exponential and logarithmic functions and	**Lectures:-** Importance of exponential functions in population growth, growth of	Assignment 1, Mid-Term Test, Final Exam,

	solve problems arising from real life applications.	an investment (compound interest), radioactive decay and logarithmic functions which is used to measure intensity of earthquakes, light and sound intensity etc. Definition of exponential function, Natural exponential function, logarithmic function, common logarithms and natural logarithms, it's properties, Laws of Logarithm, Expanding and combining logarithms, Guidelines for solving Exponential and logarithmic equation, Modeling with exponential and logarithmic functions. **Board Demonstration:-** Graphs of exponential functions. Graphs of natural exponential function; Graphs of logarithmic functions; **Problem Solving Session:-** 2.1, 2.2, 2.3, 2.4, 2.5 and 2.6 Exercises Questions. **Group work:-** Work sheet **Self-Study :-**Home work and assignment	Class Works and Home Works.
3.	Analyze the trigonometric and circular functions.	**Lectures:-** Different Types of angles, Significance of trigonometry in real life, Concept of circular function, Trigonometric Identities, values, properties, periodic properties and Graphs of Trigonometric functions. **Board Demonstration:-** Graphs of Sine, Cosine and tangent. **Problem Solving Session:-** 3.1 and 3.2 Exercises Questions.	Assignment 2, Quiz 2, Final examination, Class Works and Home Work.

		Group work:- Work sheet **Self-Study** :-Home work and assignment	
4.	Demonstrate an understanding of trigonometric identities and solve oblique triangles in Real life applications by Law of Sines and Cosines.	**Lectures:-** Explain methods to solve oblique triangles using Law of sines and cosines which is applicable in tracking a satellite, in surveying etc. Simplifying trigonometric expressions and verifying identities. **Board Demonstration:-** Formulas for Law of Sines and Cosines. **Problem Solving Session:-** 3.3 and 3.4 Exercises Questions. **Group work:-** Work sheet **Self-Study** :-Home work and assignment	Quiz 3, Final examination, Class Works and Home Works.
	5. Define and formulate the basic concepts of statistics and probability.	**Lectures:-** Measures of central tendency, Measures of dispersion, representation of data using different types of graphs. **Board Demonstration:-** Different types of graphs such as bar graphs, histogram & pie chart, Probability using tree diagrams. **Problem Solving Session:-** 4.1, 4.2, 4.3, 4.4 and 4.5 Exercises Questions. **Group work:-** Work sheet. **Self-Study :-** Home work and assignment.	Quiz 4, Final examination, Class Works and Home Works.

| 6. Manage Time, accept responsibility, carry out research skills, Take notes and develop presentation skills. | a) Work in groups, follow class room rules, class attendance and punctuality, meet deadlines, use a variety of study techniques and maintain portfolio with required information.
b) Use the library system or internet facility in assignments and for reference in studies.
c) Write down learning outcomes, main ideas, formulas, equations, process and solving techniques, organize lesson wise information, daily reflection and summarize the lessons and glossary.
d) Outline and define main concepts, enhance mode of presentation, address questions from audience and invite constructive feedback. | Group Work, Class work, Assignments, Assessments, Portfolio and Presentation. |

4. ASSESSMENT WEIGHTING

Assessment	Percentage of final mark (%)
Final Examination	40
Mid-Term Examination	20
Quizzes	15
Assignments	10
Portfolio	10
Participation	5
TOTAL	**100%**

5. ACHIEVING A PASS

Students will achieve 0 credit hours for this course by passing and achieving a **minimum overall score of 60%**

*NB *Ensure that ALL learning outcomes are taken into account*

6. COURSE CONTENT (Indicative)

LECTURE TOPIC	TIME (HOURS)
Introduction (Basic concepts of Mathematics)	2
Functions and Graphs: Definition of function, examples, Analyzing Functions, Evaluating functions.	2
Domain and Range of functions.	2
Graphs of Functions; Vertex, Domain, Range, Axis of symmetry and Intercepts, Transformation of graphs.	2
Three types of symmetry of an equation.	2
Exponential and Logarithmic Functions: Evaluating Exponential Functions, Graphs of Exponential functions, The Natural Exponential Function: Evaluating Natural Exponential Function and its graph.	2
Compound interest and Continuous Compound Interest.	2
Logarithmic functions: Definition and Graph of Logarithmic functions. Properties of logarithm, Inverse relationship between exponents and logarithmic functions.	2
Common and Natural logarithm and its properties, Evaluating logarithmic function, Laws of logarithm.	2
Using laws of logarithms to evaluate expressions, Expanding and combining logarithmic expression.	2
Practice Session for Mid-Term Exam	2
Exponential and Logarithmic Equations: Solving Exponential and logarithmic Equations.	2
Modeling with Exponential and Logarithmic function: Exponential growth, Radio active Decay.	2
Newton's Law of cooling	2
Trigonometry: Different types of angles.	2
Circular Functions, Trigonometric Functions and their Graphs: Graphs of of Sine, Cosine, tangent Functions.	2
The Law of Sines and The Law of Cosines.	2
Real life Application; The Law of sines and cosines.	2
Analytic Trigonometry: Simplifying trigonometric expressions Proving trigonometric expressions.	2
Introduction to Statistics & Probability: Statistics; Types of data	2
Measures on Central Tendency	2
Measures of Dispersion, Graphical representation of data.	2
Introduction to Probability; Basic Definitions, Formula, Finding probability of events.	2
Probability of an event using tree diagram.	2
Permutation and combination concepts.	2
Review and Practice for Final Exam (Learning outcomes 1,2,3,4,5)	2
TOTAL HOURS	**52**
Plus **RECOMMENDED INDEPENDENT STUDY HOURS**	

TOTAL COURSE HOURS	56

7.   RECOMMENDED READING

Core text/s:

Pure Mathematics Study Material.

Library + online resources:

1.   Pre-calculus Mathematics for Calculus

   Authors: JAMES STEWART, LOTHAR REDLIN AND SALEEM WATSON

2.   Title of book: Active Mathematics.
    Authors: B.V.HONY AND D.A.TURNER

3.   Title of book: Mathematics for the Future
    Authors: JIM MILLER AND GRAHAM NEWMAN

4.   Title of book: Extended Mathematics
    Author: COLIN NYE

5.   Title of book: Applied Calculus 11th – edition
    Authors: HOFFMANN, BRADLEY, SOBECKI AND PRICE

Online resources:
1) http://www.purplemath.com/modules/index.htm
2) http://en.wikipedia.org/wiki/Portal:Mathematics#Topics_in_mathematics
3) http://www.coolmath.com/precalculus-review-calculus-intro/index.html
4) http://www.freemathhelp.com/
5) http://www.intmath.com/
6) http://www.mathsisfun.com/index.htm
7) http://patrickjmt.com/
8) http://hotmath.com/hotmath_help/topics/index_hotmath_review.html
9) http://www.brightstorm.com/math/precalculus/
10) http://www.khanacademy.org/math/algebra/algebra-function