جامعة التقنية والعلوم التطبيقية بـإبـراء
University of Technology and Applied Sciences - Ibra

Department : Information Technology	**Specialization : GFP**		**Academic Year: 2020-2021**	Semester: II
Course Code: MATH 1102	**Contact hours**	**Lecture: 3 hrs.**	**Qualification: Intermediate**	
Course Name: PURE MATH		**Problem Solving: 1 hr**	**Passing Mark: 50**	
Pre-requisite: Basic Mathematics (FPMT 0001)				

Colleges of Technology Moto	"Where Technology is Invented"
Vision	To be at the forefront of higher education institutions in technological education nationally and regionally.
Mission	To provide high quality learning, training and research environment towards developing technological, innovative and entrepreneurial capabilities to meet the ever evolving social and economic needs.
GFP Aims :	• Help students to gain effective command of the required skills in English Language, Mathematics and Information Technology. • Provide realistic learning opportunities for students to speak, listen, read and write social, workplace and academic English confidently and effectively. • Provide a solid foundation in English, Mathematics, and Information Technology to allow them to perform successfully in a variety of academic programs at a higher level. • Equip students with the skills and attitudes to successfully participate in lifelong learning in their academic programs and future careers. • Develop social competence by helping students to acquire teamwork and decision making skills. • Develop academic competences which will include logical and abstract reasoning, problem solving, higher level cognitive and critical thinking.

Course Goals	To introduce to students the mathematical knowledge on reasoning function, relations, trigonometry, geometry and fundamentals of statistics that could be applied in solving natural problems.

Course Objectives	Course Learning Outcomes
Upon completion of this course, the students will be able to:	A student who satisfactorily complete the course should be able to:
1. Acquire the knowledge of definitions, graphs of quadratic, trigonometric functions and trigonometric identities.	a. Demonstrate and understanding of the definition of a function and its graph.
	b. Solve quadratic equations using quadratic formula.
	g. Demonstrate and understanding of trigonometric identities.
2. Learn about special functions, the relation between them and exploit their applications to real world problems.	c. Define and manipulate exponential and logarithmic functions and solve problems from real life applications.
	d. Understand the inverse relationship between exponents and logarithms and use this relationship to solve related problems.
	e. Understand the definition of the different types of angles and measure them in degrees and radians l. Apply arithmetic and geometric formula to solve various computing problems.
	f. Describe analytically the trigonometric and circular functions.
3. Acquire the knowledge of real life problem solving techniques using laws of trigonometric functions in usage of software in drawing and interpreting graphs and equations.	h. Use the law of sine and cosines to solve a triangle and real life problems.
	i. Use appropriate software to interpret equations and graphs.
4. Learn the basic elements of descriptive statistics and their applications.	j. Understand basic concepts of descriptive statistics, mean, median, mode and summarize data into tables and simple graphs (bar charts, histogram and pie chart).
5. Get introduced to the basic concepts of probability theory which has wide applications in almost all specializations.	k. Understand basic probability concepts and compute the probability of simple events using tree diagrams and formulas for permutations and combinations.

GRADUATE ATTRIBUTES

No.	Graduate Attributes	Learning Outcome
Attribute 1:	Effective Communication	-
Attribute 2:	Scholastic rigors practical competence	a - k
Attribute 3:	Team Work	c, j, k
Attribute 4:	Lifelong Learning	a, b, c, e, l, j, g
Attribute 5:	Autonomy and Accountability	a - k
Attribute 6:	Innovation	a, b, c, l, i, k
Attribute 7:	Entrepreneurship	g, c, i, l, j

College Principles / Values	Assessment & Activities (Study Skill)	Mapping with College Principles/ Values
1. **Integrity** - to demonstrate ethical practices in all transactions, interactions and processes 2. **Professionalism** - To apply agreed rules and regulations, following set policies including code of conduct and standard operating procedures and working diligently to attain set outcomes 3. **Pursuit of Knowledge and Excellence** - To establish life-long learning excellence in technological knowledge acquisition, application and innovation 4. **Participation and Partnership** - To enhance participation and partnership relations within and beyond Colleges of Technology	Information Provided in Course outline	2
	Group/Unique Assignment	1, 3
	Class participation	4
	Usage of OER	1, 4
	Class activity	4
	Online quiz	4
	Home work	2, 4
	MHC	1, 2, 3, 4
	E-Learning	3, 4
	Usage of Moodle by means of Mobile	4
	Group Discussion / Activities	1, 4
	Class presentation	3, 4
	Plagiarism (Information Provided in Course Outline)	1

Course Outline

Course Code: MATH 1102 **Course Name: PURE MATH**

Course Outcome No.	Topics & Contents to be Covered	Contact hours			Week No.	Method/s (Plan/s) for coverage of Outcomes	Source (Text/ Reference books)
		Lecture	Problem Solving	Self-learning			
a	**Introduction, Technical setup issues**	1	-	-	1	Step by Step Construction, Heuristic methods, Discussion and Lecture method. online discussion	1. Raymond A. Barnett, Michael R. Zigler & Karl E. Byleen, 7th edition, College Algebra with Trigonometry, McGraw Hill. 2. Pre-Calculus, Fifth edition by James Stewart.
	Chapter 1: Functions and Graphs **1.1 Functions** **1.2 Graphing Functions** **1.3 Composite functions** **1.4 Inverse functions**	5	4	4	1, 2 & 3		
b	**Chapter 2: Quadratic Equations** **2.1 Quadratic Formula**	1	1	2	3	Lecture method, online discussion, personal work (assignment etc.). Online Quiz 1: (Ch.1.1,1.2 & 1.3)	
c & d	**Chapter 3: Exponential and Logarithmic Functions** **3.1 Exponential and Logarithmic Functions** **3.2 Applications of Exponential and Logarithmic Functions**	2	2	4	4	Online Class room discussion, class room activities by giving worksheets, Lecture Method.	
e, f, & g	**Chapter 4: Trigonometric Functions** **4.1 Angles and their Measures** **4.2 Circular Functions** **4.3 Trigonometric Identities**	2	2	4	5	Heuristic method, Lecturer method and Online class room activities by giving worksheets, etc. Class Activiy on Ch. 3.1 (5 Marks)	1. Raymond A. Barnett, Michael R. Zigler & Karl E. Byleen, 7th edition, College Algebra with Trigonometry, McGraw Hill. 2. Pre-Calculus, Fifth edition by James
	Test, Test revision and preparation (Chapter 1 to 4.1)				6		

g & h	**Chapter 5: Trigonometry: Oblique Triangles** **5.1 Inverse Trigonometric Functions** **5.2 Non-right Triangles: Law of Sines** **5.3 Non-right Triangles: Law of Cosines**	2	2	6	7	Lecture method and classroom discussion (student centered learning) and extra work in e-learning	Stewart. 3. Higher Engineering Mathematics, John Baird, 6th Edition, Elsevier, 2010.
h & l	**Chapter 6: Sequences** **6.1 Arithmetic Sequences** **6.2 Geometric Sequences**	2	2	4	8	Heuristic method, Lecturer method and class room activities by giving worksheets, etc. Online Quiz 2: (Ch.5)	
l & j	**Chapter 7: Statistics** **7.1 Measures of Central Tendency** **7.2 Summarizing Data into Tables and Graphs**	1	1	2	9	**Through Moodle Resource** Heuristic method, Lecture method, group discussion, Self study quiz (Ch.7: 7.1, Ch. 9)	1. Allan G. Bluman, 5th edition, Elementary Statistics, McGraw Hill Publishing Company.
k	**Chapter 8: Probability** **8.1 Basic Concepts of Probability** **8.2 Probability Using Tree Diagrams** **8.3 Probability Using Permutations and Combinations**	3	3	6	9, 10	Lecture method and classroom discussion and extra work in e-learning	Introduction to probability and statistics by Seymour LipschutxandJohn Schiller. Online open software: Geogebra classic
k & i	**Chapter 9: Introduction of GeoGebra** **9.1 GeoGebra Installers** **9.2 Opening GeoGebra Files** **9.3 Exploring Polynomials** **9.4 Visualizing a System of Linear Equations**	Self-study		6	9	Lecture method and classroom discussion and extra work in e-learning. Software demonstration, online practice session.	
	Tutorial	2	2		11		
	Total:	**21**	**19**				
		40					

Additional Information

	Course Work	Marks Distribution	Total Marks
Assessment Plan	Test (Chapter 1 to 4.1)	25	45
	Self – Study (Chapter 7: 7.1 - Measures of central tendency, Chapter 9: Introduction of GeoGebra)	5	
	Quiz*	10	
	Class Activities* (Chapter 3: 3.1-Exponential and Logarithmic Functions) • Online activities • Work in pairs/group activities • Class presentation • Unique class activities	5	
	Final Exam	55	55
	TOTAL	**100**	

Class activity – 5 Marks: (during Week 5) The topics will be from **Chapter3: 3.1- Exponential and Logarithmic Functions** as mentioned in Course Outline. The student has to attempt the online quiz in the e-learning portal. Marks will be awarded based on the performance of the student.

Self-study test – 5(4+1) Marks: (during Week 9) The topic will be **Chapter 7: 7.1-Measures of Central Tendency, Chapter 9: Introduction of GeoGebra** as mentioned in Course Outline. The student has to study these topics and a online quiz for **40 minutes** will be conducted and it will be announced well ahead to the students.

Quiz-10 Marks: Online Quiz-1:Chapter 1: 1.1, 1.2, 1.3 (during Week 3), Online Quiz-2:Topic:Chapter-5 (during Week 8)
The student has to attempt the assessment quizzes from the E – learning Portal, average of marks of these two quizzes will be considered as the quiz marks.

Final Exam-55 Marks: (during Week 12/13) Final Exam can be comprehensive and include all material (chapters) covered in the course. Ensure that larger weight is given to the outcomes covered after Test . For the Final Exam 30% (16.5 Marks) of the learning outcomes from Test topics (Chapter 1, Chapter 2, Chapter 3 and Chapter 4: 4.1) and 70% (38.5 Marks) from the remaining topics (Chapter 4: 4.2 to Chapter 7) to be considered.

Class Behavior & Attendance Guidelines	
Cheating	In case an accusation of cheating during a Test is proven, the following will be imposed: Disciplinary Action for Cheating Case/s: • First Offense : Zero Mark • Second Offense : Dismissal from the college
Plagiarism	Plagiarism occurs when other's work such as print material, images, audio-visual creations, computer programs, electronic materials, etc. are used without appropriate acknowledgement. Disciplinary Action for Student Plagiarism: ➢ First Offense : Written warning and repeat the work ➢ Second Offense : Zero mark and suspension for one semester ➢ Third Offense : Dismissal from the college
Attendance	➢ Students will get the first warning letter if his/her absence reaches 10% without any valid excuses, second warning letter will be issued for 20%. If the absence reaches 30%, a Debar Letter will be issued. ➢ A student will be considered as LATE when s/he arrives after 10 minutes of the class start time. Being LATE for THREE times in a class will be considered as ONE class absence. ➢ If a student failed to take any of the tests with a valid reason, s/he has to submit the supporting documents within one week from the date of examination which s/he failed to attend.
Health & Safety	HCT is committed to provide a healthy and safe working and learning environment for staff, students and visitors. Students are requested to ➢ manage and maintain a work environment where risks to health and safety are minimal ➢ be aware and protected against hazards at the workplace ➢ help the college in protecting staff, students, and visitors from any dangers in case of emergency or crisis ➢ read the procedures from this policy, that are to be followed in case of events such as fire, smoke, natural calamities and accidents

Note: *Course Outline is subject to change at the discretion of the instructor to accommodate instructional and/or students' needs.*

MATH HELP CENTER TIME TABLE

S. No.	Day	Time
1	Sunday	
2	Monday	
3	Tuesday	
4	Wednesday	
5	Thursday	

Pure Math Course – Calender of Activities

Week No.	Date / Day (Sunday to Thursday)	1st class (2 hrs)	2nd class (2 hrs)
1	24 – 01 – 2021 to 28 – 01 – 2021	**Introduction, Explain CDP & Assessment plan,** Chapter 1: Functions and Graphs 1.1	
2	31 – 01 – 2021 to 04 – 02 – 2021	Chapter 1: Functions and Graphs 1.2 and 1.3	
3	07 – 02 – 2021 to 11 – 02 – 2021	Chapter 1: Functions and Graphs 1.3, 1.4, Chapter 2: Quadratic Equations	
Quiz-1: Online during week 3 (Marks: 10, Duration: 45 minutes, Topics: Chapter 1: 1.1, 1.2, 1.3)			
4	14 – 02 – 2021 to 18 – 02 – 2021	Chapter 3: Exponential and Logarithmic Functions 3.1, 3.2	
5	21 – 02 – 2021 to 25 – 02 – 2021	Chapter 4: Trigonometric Functions 4.1, 4.2, 4.3	
Class Activity: Online during week 5 (Marks: 5, Duration: 20 minutes, Topics: Chapter 3: 3.1: Exponential and Logarithmic Functions)			
6	28 – 02 – 2021 to 04 – 03 – 2021	**ELC Progress Test for English and Math**	
Test: During week 6 (Marks: 25, Duration: 90 minutes, Topics: Chapter 1 to Chapter 4: 4.1)			
7	07 – 03 – 2021 to 11 – 03 – 2021	Chapter 5 Trigonometry: Oblique Triangles 5.1, 5.2, 5.3	
8	14 – 03 – 2021 to 18 – 03 – 2021	Chapter 6: Sequences 6.1, 6.2	
Quiz-2: Online during week 8 (Marks: 10, Duration: 45 minutes, Topics: Chapter-5)			
9	21 – 03 – 2021 to 25 – 03 – 2021	Chapter 7: Statistics 7.2, Chapter 8: Probability 8.1	
Self-Study during week 9 (Marks: 5(4+1), Duration: 20 minutes, Topics: Chapter7: 7.1 and Chapter-9)			
10	28 – 03 – 2021 to 01 – 04 – 2021	Chapter 8: Probability 8.2, 8.3	
11	04 – 04 – 2021 to 08 – 04 – 2021	Tutorial	
Final Exam: during week 12/13 (Duration:2 hours) (55 Marks) Topics: All Chapters (Full Book) Chapter 1 to Chapter 4: 4.1 – Marks - 16.5 - 30%, Chapter 4: 4.2 to Chapter 9 – Marks - 38.5 -70%			

Quiz* = Average of quiz 1 and quiz 2