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:FPMT0001	**Contact hours**	**Lecture: 3 hrs**	**Qualification: Elementary**	
Course Name: Basic Mathematics		**Problem solving/practical: 1hr**	**Passing Mark: 50**	
Pre-requisite: None				

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 to, 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 ensure that students are equipped with the mathematical understanding and skills necessary to meet the cognitive and practical requirements of postsecondary or higher education studies in a variety of disciplines.

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. Bridge the gap in mathematical skills between secondary school and higher education	a) Describe the set of real numbers, all its subsets and their relationship.
	b) Identify and use the arithmetic properties of subsets of integers, rational, irrational, and real numbers, including closure properties for the four basic arithmetic operations where applicable.
	c) Demonstrate an understanding of the exponent laws, and apply them to simplify expression and manipulate fractions, ratios, decimals, and percentages.
2. Learn mathematical concepts and problems through English medium of instruction and teaching and get prepared to achieve the prescribed learning outcomes.	d) Understand measurements and conversion from one unit to another.
	f) Translate worded problems into mathematical expression and model simple real life problems with equations and inequalities.
3. Solve and interpret results using algebraic tools.	h) Use coordinate plane to solve algebraic and geometric problem, and understand geometric concepts such as equation of circle, perpendicular, parallel, and tangent lines.
	i) Use the three types of symmetry of an equation to sketch its graph.
4. Acquire necessary knowledge and skills to pursue Higher studies.	l) Know the relationship between degree and radian measure of an angle and find the length of a circular arc and the area of a sector.
	m) Understand trigonometric and circular functions and use the fundamental trigonometric identities in various problems.
	n) Solve a right angle triangles using angle of elevation and depression.
	o) Apply knowledge of basic algebra and trigonometry in real life problems.
5. Apply their knowledge of mathematics using appropriate methods, to rewrite problems from one form to another and to solve problems using suitable strategies.	e) Simplify rational expressions and rationalize numerators or denominators.
	g) Solve linear equations, equations involving radicals, fractional expression and inequalities.
	j) Perform operations on polynomials and manipulate numerical and polynomial expressions and solve first degree equations.
	k) Use the quadratic formula to find roots of a second-degree polynomial.

GRADUATE ATTRIBUTES

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

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: FPMT0001 **Course Name: BASIC MATHEMATICS**

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 / Practical	Self-Learning			
	Introduction	1			1		
a, b, c, o	1. REAL NUMBERS 1.1 Classification of Real Numbers 1.2 Properties of Real Numbers 1.3 Fractions, Ratios and Percent	3	2	4	1, 2	White board teaching, Class discussion	College Algebra with Trigonometry, 7th edition by Raymond A. Barnett, Michael R. Ziegler, Karl E. Byleen, Tata Mcgraw hill publishers
c ,e, g	2. EXPONENTS AND RADICALS 2.1 Integer Exponents 2.2 Rational Exponents 2.3 Radicals	3	3	3	2, 3	Analytic method, class assignment	Mathematics for engineering, 2nd edition by W. Bolton, Routledge publishers
j	3. POLYNOMIALS 3.1 Add and Subtract Polynomials 3.2 Multiply Polynomials	1	1	3	4	Analytic method, class assignment	Mathematics for engineering, 2nd edition by W. Bolton, Routledge publishers
j	4. FACTORING POLYNOMIALS 4.1 Greatest Common Factor and Factor by Grouping 4.2 Factor Trinomials 4.3 Factor Special Products	2	2	5	4, 5	Student centered learning, Class discussion	Mathematics for engineering, 2nd edition by W. Bolton, Routledge publishers
	Test, Test revision and preparation (Chapter 1 to 4)				6	Class discussion	

e	5. RATIONAL EXPRESSIONS 5.1 Multiply and Divide Rational Expressions 5.2 Add and Subtraction of Rational Expressions 5.3 Simplify Complex Rational Expressions	2	2	5	5,7	White board teaching, Class participation, Home assignment	College Algebra with Trigonometry, 7th edition by Raymond A. Barnett, Michael R. Ziegler, Karl E. Byleen, Tata Mcgraw hill publishers
d, o	6. SYSTEMS OF MEASUREMENT 6.1 U.S. System 6.2 Metric System 6.3 Conversion Between U.S. and Metric Systems 6.4 Measurements of Temperature	Self -Study		4	7	White board teaching and Class discussion	College Algebra with Trigonometry, 7th edition by Raymond A. Barnett, Michael R. Ziegler, Karl E. Byleen, Tata Mcgraw hill publishers
f, g, o	7. LINEAR EQUATIONS & INEQUALITIES 7.1 Linear Equations 7.2 Applications of Linear Equations 7.3 Linear Inequalities	3	3	4	7,8	Through Moodle Resource Synthetic Method	College Algebra with Trigonometry, 7th edition by Raymond A. Barnett, Michael R. Ziegler, Karl E. Byleen, Tata Mcgraw hill publishers
k, o	8. QUADRATIC EQUATIONS 8.1 Quadratic Formula 8.2 Applications of Quadratic Equations	2	1	4	9	White board teaching and Class discussion	Mathematics for engineering, 2nd edition by W. Bolton, Routledge publishers
h, i	9. COORDINATE GEOMETRY 9.1 Rectangular Coordinate System 9.2 Straight Lines 9.3 Circle 9.4 Testing Equations for Symmetry	3	2	5	9,10	Class discussion and solving problems	College Algebra with Trigonometry, 7th edition by Raymond A. Barnett, Michael R. Ziegler, Karl E. Byleen, Tata Mcgraw hill publishers
l, m, n, o	10. TRIGONOMETRY 10.1 Angles and Circle 10.2 Trigonometric Ratios and Identities 10.3 Applications of Trigonometry	2	1	4	11	Deductive Method	Mathematics for engineering, 2nd edition by W. Bolton, Routledge publishers

	Tutorial	30 Min.	30 Min		11	Deductive method, class discussion, Problem solving method	College Algebra with Trigonometry, 7th edition by Raymond A. Barnett, Michael R. Ziegler, Karl E. Byleen, Tata Mcgraw hill publishers
TOTAL		22 Hrs 30 Min.	17 Hrs 30 Min.				
		40 Hrs.					

	Course Work	Marks Distribution	Total Marks
Assessment Plan	Test (Chapters 1, 2, 3 & 4)	25	45
	Self – Study (Topics:6.1,6.2,6.3 & 6.4)	5	
	Quiz *	10	
	Class Activities * **(Topics 2.2,2.3 & Chapter 3)** ○ Online activities ○ Work in pairs/group activities Class ○ presentation ○ Unique class activities	5	
	Final Exam	55	55
	TOTAL	**100**	

Class Activity (Online) during Week-5 (5 Marks) Topics : Chapter 2.2,2.3 & Chapter 3 The student has to attempt the online quiz in E-learning portal. Marks will be awarded based on the performance of the students.
Self-Study Test during Week-7(5 Marks): The topics will be **Chapter 6 (Sections: 6.1, 6.2, 6.3 and 6.4)** as mentioned in Course Outline. The student has to study these topics and a quiz for **20 minutes** will be conducted. It will be announced well ahead to the students.
Quiz*(10 Marks) Topics: Quiz 1 : Chapter 1 & 2.1 (during Week 3) **Quiz 2 : Chapter 5 & 7 (during Week 9)** The student has to attempt Quiz 1 and Quiz 2 through E-learning portal, average marks of these two quizzes will be considered as Quiz marks .
Final Exam: 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% of the learning outcomes from Test and 70% from the remaining to be considered. **(55 Marks)** **Topics:** 1.1 to 4.3 Marks: 16.5 (30%) 5.1 to 10.3, Marks: 38.5 (70%)

Additional Information

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	

Basic Mathematics Calendar of Activities

Week No.	Date / Day (Sunday to Thursday)	1st Class (2 hours)	2nd Class (2 hours)
1	24-01-2021 to 28-01-2021	INTRODUCTION, EXPLAIN CDP & ASSESSMENT PLAN, Topic 1: REAL NUMBERS (ON)	
2	31-01-2021 to 4-02-2021	REAL NUMBERS , Topic 2: EXPONENTS AND RADICALS (ON)	
3	7-02-2021 to 11-02-2021	Topic 2: EXPONENTS AND RADICALS	
Quiz 1- Online during Week-3 (10 Marks and **Duration:45 mins), Topics: Chapter 1 and 2.1**			
4	14-02-2021 to 18-02-2021	Topic 3: POLYNOMIALS , Topic 4: FACTORING POLYNOMIALS (ON)	
5	21-02-2021 to 25-02-2021	Topic 4: FACTORING POLYNOMIALS, Topic 5 : RATIONAL EXPRESSIONS (ON)	
Class Activity -Online during Week-5 (5 Marks and Duration:20 min), Topic: Chapter 2.2, 2.3 & Chapter 3			
6	28-02-2021 to 4-03-2021	ELC PROGRESS TEST FOR ENGLISH & BASIC MATH TEST	
Test during Week-6 (25 Marks and **Duration:1h &30 mins), Topics: Chapter 1, 2 , 3 and 4**			
7	7-03-2021 to 11-03-2021	Topic 5 : RATIONAL EXPRESSIONS, Topic 7 : LINEAR EQUATIONS AND INEQUALITIES (ON)	
Self- Study during Week-7 (5 Marks and Duration:20 min), Topic: Chapter 6 (6.1,6.2,6.3,6.4)			
8	14-03-2021 to 18-03-2021	Topic 7 : LINEAR EQUATIONS AND INEQUALITIES	
9	21-03-2021 to 25-03-2021	Topic 8 : QUADRATIC EQUATIONS AND APPLICATIONS, Topic 9 : COORDINATE GEOMETRY (ON)	
Quiz 2- Online during Week-9 (10 Marks and **Duration:45 mins), Topics: Chapter 5 and 7**			
10	28-03-2021 to 1-04-2021	Topic 9 : COORDINATE GEOMETRY	
11	4-04-2021 to 8-04-2021	Topic 10 :TRIGONOMETRY, **Tutorial**	
Final Exam: during Week-12/13 (Duration: 2 hours) (55 Marks) Topics: Full book, Chapter 1 to 4, Marks: 16.5 (30%) Chapter 5 to 10, Marks: 38.5 (70%)			

Quiz * =Average of Quiz 1 and Quiz 2