COURSE OUTLINE: MTH123 - COMPUTER MATH

Prepared: The Mathematics Department
Approved: Bob Chapman, Chair, Health

Course Code: Title	MTH123: COMPUTER MATHEMATICS
Program Number: Name	2095: COMPUTER PROGRAMMING
Department:	MATHEMATICS
Academic Year:	2022-2023
Course Description:	This course presents mathematics needed in computer studies. Emphasis is placed on developing logical thinking skills and an algorithmic approach to problem-solving.
Total Credits:	3
Hours/Week:	3
Total Hours:	45
Prerequisites:	There are no pre-requisites for this course.
Corequisites:	There are no co-requisites for this course.
Substitutes:	MTH122
Vocational Learning Outcomes (VLO's) addressed in this course: **Please refer to program web page for a complete listing of program outcomes where applicable.**	**2095 - COMPUTER PROGRAMMING** VLO 10 Contribute to the development, documentation, implementation, maintenance and testing of software systems by using industry standard software development methodologies based on defined specifications and existing technologies/frameworks. VLO 11 Apply one or more programming paradigms such as, object-oriented, structured or functional programming, and design principles, as well as documented requirements, to the software development process. VLO 12 Model, design, implement, and maintain basic data storage solutions.
Essential Employability Skills (EES) addressed in this course:	EES 3 Execute mathematical operations accurately. EES 4 Apply a systematic approach to solve problems. EES 5 Use a variety of thinking skills to anticipate and solve problems. EES 10 Manage the use of time and other resources to complete projects.
Course Evaluation:	Passing Grade: 50%, D A minimum program GPA of 2.0 or higher where program specific standards exist is required for graduation.
Books and Required Resources:	Mathematics for Computer Technology by Robert McCullough Publisher: Morton Publishing Company Edition: 3 ISBN: 9780895827005 Calculator

Sharp EL-520XTB (available in the bookstore)

Course Outcomes and Learning Objectives:	**Course Outcome 1**	**Learning Objectives for Course Outcome 1**
	1. Basic algebra review	1.1 Define the sets of numbers: natural numbers, integers, rational numbers and real numbers. 1.2 Know the properties of real numbers and given an example, name the property. 1.3 Know the rules of exponents and simplify exponential and radical expressions. 1.4 Use BEDMAS to evaluate arithmetic and algebraic expressions. 1.5 Solve equations and inequalities of first degree or solve for a specified variable. 1.6 Convert units of measure using the SI metric system.
	Course Outcome 2	**Learning Objectives for Course Outcome 2**
	2. Number systems	2.1 Identify the face value and place value of the digits in a number. 2.2 Write a base 10 number in expanded form. 2.3 Using base 2,4,8,and 16, convert to and from base 10 using various methods. 2.4 Perform the operations of addition and subtraction using base 2,4,8,and 16 numbers.
	Course Outcome 3	**Learning Objectives for Course Outcome 3**
	3. Computer considerations	3.1 Define significant digits, accuracy and precision. 3.2 State the accuracy and precision of a quantity, and round off to a given accuracy. 3.3 Write a number in decimal notation, standard notation and engineering notation. 3.4 Convert between frequency and period using SI units. 3.5 Use the one byte method and two`s complement form for negatives to store an integer. 3.6 Represent a real number with four bytes using the IEEE standard.
	Course Outcome 4	**Learning Objectives for Course Outcome 4**
	4. Sets	4.1 Write a set by listing the elements of the set. 4.2 Write a set by using set-builder notation. 4.3 List all the subsets and proper subsets of a given set. 4.4 State and perform the operations of union, intersection and complement. 4.5 Draw a Venn diagram to find the relationship between sets A, B, and C. 4.6 Know the basic properties of sets and given an example, name the property.
	Course Outcome 5	**Learning Objectives for Course Outcome 5**
	5. Logic	5.1 Define a statement, compound statement and a connective. 5.2 Construct a truth table using various connectives and statements.

	Course Outcome 6	Learning Objectives for Course Outcome 6
		5.3 Using a truth table, show that two statements are equivalent. 5.4 Define a tautology and a contradiction. 5.5 Using a truth table or a Venn diagram, show whether an argument is valid or invalid. 5.6 Know the basic properties of mathematical logic and given an example, name the property.
	6. Boolean algebra	6.1 Use the two operations of Boolean algebra to evaluate a binary expression. 6.2 Show the way electricity flows in a parallel circuit and in a series circuit. 6.3 Draw a network to represent a given Boolean expression. 6.4 Know the basic properties of networks and given an example, name the property. 6.5 Simplify a network by writing the property used in each step of the simplification. 6.6 Find the output from a pair of numbers passing through an AND gate, OR gate or NOT gate. 6.7 Draw a logic circuit to represent a Boolean expression. 6.8 Find the output from a half-adder and full-adder circuit for a given condition.

Evaluation Process and Grading System:

Evaluation Type	Evaluation Weight
Attendance/Assignments/Quizzes	20%
Tests (possibly 6)	80%

Date: June 1, 2022

Addendum: Please refer to the course outline addendum on the Learning Management System for further information.

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