MTL 406	Lab - 1	2 Credits (2 hours lab /week)

Practicals for I Semester

Mathematics practical with Free and Open Source Software (FOSS) tools for computer programs

Course Outcome/Specific Outcome: Students will have the knowledge and skills to implement the programmes listed below in the Scilab programming language. Student are expected to apply these programming skills of computation in science and Engineering.

1) Program to accept three integers and print the largest among them and program to check whether a given integer is even or odd and also positive or negative.
2) Program to find roots of a quadratic equation.
3) Program to perform arithmetic operations using switch case.
4) Program to convert binary number to decimal number and decimal number to binary number.
5) Program to calculate factorial of a number and program to print Fibonacci numbers.
6) Program to search an element in the array.
7) Program to arrange a set of given integers in an ascending order and print them.
8) Program to find row sum and column sum of a matrix.
9) Program to find the Transpose, Trace and Norm of a matrix.
10) Program to find sum, difference and product of two matrices.
11) Program to test whether a given integer is a prime and program to generate prime numbers between two give numbers.
12) Program to find the Armstrong Number between two given numbers and program to test whether a given number is Palindrome or not.

Note: The above list may be changed annually with the approval of the PG BOS in Mathematics.

II Semester

MTE 451	Discrete Mathematics and Applications	3 Credits (36 hours)

Prerequisite: Basic Mathematics up to XII/PU.

Course Outcome: Students will have the knowledge and skills to explain the concepts of Discrete Mathematics and to develop logical thinking and its application to computer science, to enhance one's skills in solving real life problems related to counting, by applying various counting techniques, to illustrate applications of Boolean algebra and group theory in designing logic gates and coding theory.

Course Specific Outcome: At the end of the course students will have the knowledge and skills to:

- Apply basic number theory concepts like divisibility, modular arithmetic in solving congruences, changing the base of number system and their usage in cryptography.
- Solve many real life problems related to counting by the use of special tools like recurrence relations and generating functions.
- Design and simplify the logic gate networks by using lattices and Boolean algebra.
- Apply concept of groups in generating binary coding, decoding and also in error detection and error correction in the binary coding system.

Unit I - Number Theory and Cryptography:

Divisibility and Modular Arithmetic, Integer Representations and Algorithms, Primes and Greatest Common Divisors, Solving Congruences, Applications of Congruences, Cryptography.

(8 Hours)