# MITM_Logo****Muzaffarpur Institute of Technology**** (MIT), Muzaffarpur

# (Under the Department of Science & Technology Govt. of Bihar, Patna)

# Department of Information Technology

**COURSE NAME: PROGRAMMING FOR PROBLEM SOLVING LABORATORY**

**COURSE CODE: 051403**

**List of Experiments(Mandatory):**

* + - 1. Demonstration of How to Compile & Run a C Program on Windows/Linux
      2. Demonstration of Datatype, Variable Declaration/Definition and Input/Output
         1. Declare two integer (int) & Input values from the keyboard and Print the Sum of both
         2. Declare & Input two real (float) values and Print their swapped values
      3. Demonstration of Operators; their precedence & associativity
         1. Swap two numbers using **+/-** and **^(XOR)** operators
         2. Print the result for different values of A, B, C & D

**X = A++ && B-- && ++C || --D || ++A**

* + - * 1. Check whether a given number is Even or Odd using Ternary operator
      1. Demonstration of Decision Control Statement (**if – else if – else**)
         1. Input three numbers from the keyboard and Print the largest among these
         2. Input the coefficients of a Quadratic equation and Print the roots
         3. For given Angles/Sides of a triangle, check whether it is valid or not [Use Nesting]
      2. Demonstration of Loop Statements (**for, while, do-while**)
         1. Print the Binary, Octal and Hexadecimal of a given Integer
         2. Find the factorial of a given integer number
         3. Find the sum of all prime numbers from 1 to N [Use Nested Loops]
         4. Print a given pattern [Use Nested Loops]
      3. Demonstration of Case Control Statement
         1. Implement simple Calculator to perform **+**, **-, x**, **/** and **%**
         2. Check whether the input is Digit, vowel or consonant using ASCII value
         3. Implementation of Menu-Driven program [User defined runs]
      4. Demonstration of Pointers & Arrays
         1. Input your name in an array and print in reverse order
         2. Find the 2nd largest/smallest element in the given integer array
         3. Input an integer matrix and print the transpose/determinant of it [2D Array]
         4. Input two matrices, multiply/add both and print the result in Matrix form [2D Array]
      5. Demonstration of Functions & Storage classes
         1. Input two numbers and Swap it using function call by Address/Reference
         2. Find the sum of series using function call by Value
         3. Input your name & write a user defined function to print in reverse order [Pass Array]
         4. Print an integer’s correct Binary sequence & count 1’s [Use recursive function & Static variable]
      6. Demonstration of Strings & Macros
         1. Input a string and check whether it is a palindrome or not [Use string reverse library function]
         2. Input your first & last name in two strings, copy both to third string, change the case and print it
         3. Input an array of strings & write a user defined macro to print the duplicate strings
      7. Demonstration of Structure & Union
         1. Input & add two distances (in inch-feet) and print the result
         2. Input and multiply two complex numbers by passing/returning structure to/from a function
      8. Demonstration of Input/Output
         1. Use of formatted & unformatted input/output functions [printf, scanf, getch, putch, etc.]
         2. Count number of lowercase character, uppercase character, spaces, lines and words in a file

**List of some advance Experiments:**

For given Angles/Sides of a triangle, check whether it is Equilateral, Scalene or Isosceles triangle

Check whether the input is Happy/Strong/Armstrong/Palindrome number or not

Display upper/lower triangle of a given matrix

Check whether the given matrix is Identity, Sparse or Symmetric matrix

Sort the given integer array and print the sorted values.

Search an element in the given integer array and print the index/position if found

Write a Menu Driven program to perform these [Write separate functions for each]

Print first N Fibonacci numbers

Find the GCD of two given integers

Print Pascal triangle up N rows

Factorial of a given number using recursion

Solve the Tower-of-Hanoi problem using recursion

Without using loops, print the N% of a given string from beginning, center & end.

Find the frequency of a substring in a given string using recursive function

Write a user defined argumented macro to find the GCD & LCM of two given numbers

Input N students information like Name, Roll no., Semester, Branch, CGPA, etc. and print the student’s information having highest CGPA in a department and in the college.

Add/Subtract two large integer numbers using linked list and print the result

Merge two files and print the content of it.

Create Employee Record and Update it