

**Maulana Abul Kalam Azad University of Technology, West Bengal**  
(Formerly West Bengal University of Technology)  
**1<sup>st</sup> Year Curriculum Structure for B.Tech courses in Engineering & Technology**  
(Applicable from the academic session 2018-2019)

<b>Course Code :</b> ES-CS291	<b>Category :</b> Engineering Science Courses
<b>Course Title :</b> Programming for Problem Solving	<b>Semester :</b> Second
<b>L-T-P : 0-0-4</b>	<b>Credit:2</b>
<b>Pre-Requisites:</b>	

*The laboratory should be preceded or followed by a tutorial to explain the approach or algorithm to be implemented for the problem given.*

**Tutorial 1:** Problem solving using computers:

**Lab1:** Familiarization with programming environment

**Tutorial 2:** Variable types and type conversions:

**Lab 2:** Simple computational problems using arithmetic expressions

**Tutorial 3:** Branching and logical expressions:

**Lab 3:** Problems involving if-then-else structures

**Tutorial 4:** Loops, while and for loops:

**Lab 4:** Iterative problems e.g., sum of series

**Tutorial 5:** 1D Arrays: searching, sorting:

**Lab 5:** 1D Array manipulation

**Tutorial 6:** 2D arrays and Strings

**Lab 6:** Matrix problems, String operations

**Tutorial 7:** Functions, call by value:

**Lab 7:** Simple functions

**Tutorial 8 &9:** Numerical methods (Root finding, numerical differentiation, numerical integration):

**Lab 8 and 9:** Programming for solving Numerical methods problems

**Tutorial 10:** Recursion, structure of recursive calls

**Lab 10:** Recursive functions

**Tutorial 11:** Pointers, structures and dynamic memory allocation

**Lab 11:** Pointers and structures

**Tutorial 12:** File handling:

**Lab 12:** File operations

**Laboratory Outcomes**

- To formulate the algorithms for simple problems
- To translate given algorithms to a working and correct program
- To be able to correct syntax errors as reported by the compilers
- To be able to identify and correct logical errors encountered at run time
- To be able to write iterative as well as recursive programs
- To be able to represent data in arrays, strings and structures and manipulate them through a program
- To be able to declare pointers of different types and use them in defining self-referential structures.
- To be able to create, read and write to and from simple text files.