

Course Objectives (Expected Student Learning Outcomes)

Students having completed the course will be able to:

- 1) Design and write efficient computer programs using top-down design techniques and pseudocode for program development.
- 2) Apply various data types including single, double, integer, complex, and logical in conjunction with constants, variables and multi-dimensional arrays in the computer analysis of engineering problems.
- 3) Apply relational and logical operators in conjunction with branching structures.
- 4) Apply appropriate loop structures including nested loop structures and recursive operations.
- 5) Apply input and output functions, formatted I/O, and communication with data files.
- 6) Apply general intrinsic functions, and design and write callable functions.
- 7) Apply basic computer graphics techniques to produce simple xy plots, multiple plots, and simple enhanced control of plotted lines.
- 8) Apply advanced computer graphics to the display of multi-dimensional data and images, and use of advanced graphical controls
- 9) Design and write computer programs to solve engineering problems using numerical techniques and/or intrinsic functions including a) polynomial operations, b) statistical operations, c) matrix operations, d) symbolic operations, e) curve fitting, f) linear interpolation, and g) integration and differentiation.