MATH1154

INTRODUCTION TO MATHEMATICAL SOFTWARE I

(1 Credit) (Level 1) (Semester 2)

Pre-requisites:

Level 1 status

(Basic computer literacy is desirable)

Course Content:

1. **Introduction to programming:** installation of the package; introduction to various components; creation of directories and saving files; help and documentation
2. **Matrices and vectors:** creation of matrices; manipulation and basic operations; indexing and matrix dimensions; element-wise operation; basic linear algebra computations
3. **Use of built-in functions:** built-in functions related to matrices; elementary mathematical functions
4. **Language fundamentals:** array operations; relational operations; logical operations; manipulation of character strings; output formats
5. **Plots and graphics:** creation of 2-D and 3-D plots; modification of plots; specialized 2-D and 3-D plots; overlay of plots; arrangement of plots in arrays; creation of two-dimensional grid systems; saving graphs in various formats and printing of graphs; animations
6. **Symbolic computations:** algebraic manipulations; differentiation and integration
7. **Control structures:** decision statements; looping structures; nesting; exiting commands
8. **Functions:** labelling of function file; elements of a function; saving and executing a function either with or without explicit output; calling of functions; global and local variables; output commands; saving output files
9. **Programming skills:** guidelines for writing good functions; interactive input; program debugging

Evaluation:

- Course Work 100%

Lab Submissions 20%

Two equally weighted lab assignments 20%

One 1-hour laboratory-based examination	20%
One 2-hour laboratory-based examination	40%