



## Level Three

### Math Software

| Course Code | Course Num. | Course Name   | Credit Hours | Lec | Lab | Tut | Prerequisites |
|-------------|-------------|---------------|--------------|-----|-----|-----|---------------|
| MAT         | 251         | Math Software | 2            | 2   | 2   | 0   | MAT 101       |

#### **Objectives:**

This course is intended for students who are using software for the first time and have a little or no experience in computer programming. It provides an introduction to a powerful language for mathematical computation. For this course, the chosen software is MATLAB that is widely used and can be regarded as a reference for other scientific computational software as Maple, Mathematica...

#### **Syllabus:**

- **Starting with MATLAB:** Introduction to the software, Command window, *help* and *lookfor* commands, arithmetic operations, Display Formats, Built-in functions, Variables assignment, Command line editing.
- **Arrays:** Creating arrays (vectors, matrices), *linspace* command, some major matrices, operators, Matrix operations in MATLAB, Array addressing, Adding and deleting elements, Strings.
- **Operators:** Operator Precedence, Relational operations, Logical operations, *all* and *any* commands, *find* command, *sort* command, *max* and *min* command.
- **2D and 3D graphs:** *Plot* and *ezplot* command, *fplot* command, multigraphs plots, others plot commands, histograms, formatting a plot, 3D line plot, Mesh and Surface plots, *view* command.
- **Script files:** Creating and saving a file, *disp* and *fprintf* commands, loading a file, search path, defining functions, structure of a function file, *inline* function, *feval* command, local and global variables.
- **Programming:** *If-else* structure, *for* and *while* loops, *Break* and *continue* commands, *Switch-case* statement.
- **Symbolic toolbox:** Symbolic object and expressions, algebraic expression manipulation, factorization, simplification, solving equations.

#### **References:**

- **MATLAB: An Introduction with Applications**, by Amos Gilat, 3rd Edition The Ohio State Univ. 2008.
- On the Web :**An Introduction to Matlab (Version 2.3)** David F. Griffiths Department of Mathematics The University of Dundee DD1 4HN



- “Getting Started with MATLAB” Website:  
<http://www.mathworks.com/access/helpdesk/help/techdoc/matlab.html>