



## 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:*

- To provide an introduction to the use of some of the high-level mathematical programming language such MATLAB, Maple and Mathematica, as a practical aid in doing mathematics.
- To provide the student with some basic skills in the use of this software without attempting deep coverage.

In the following the phrase “math software “ refers to the specific math language used by the instructor.

### *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, 3<sup>rd</sup> Edition** Amos Gilat, The Ohio State Univ. 2008.
- **MATLAB Primer**, K. Sigmon & T. Davis, Champan & Hall, 6th ed., 2002 .
- **Maple V: learning Guide**, K. Heal & K. Rickard, Springer Verlag, 1996.
- **Mathematica by example**, M. Abell & J. Braselton, Academic Express, 1997.

