Course Title	**Programming and Numerical Methods**				
Course Code	**MME 208**				
Course Type	Compulsory				
Level	Undergraduate				
Year / Semester	2nd year / 4th Semester				
Teacher's Name	Vasileios Vavourakis				
ECTS	5	Lectures / week	3 hours	Laboratories / week	1 hour
Course Purpose and Objectives	This course aims to familiarize the students using a personal computer (PC) in numerical analysis. As such, they will be taught computer programming using MATLAB and FORTRAN for engineers, and in building their foundations in numerical methods.				
Learning Outcomes	• Code computer programs in MATLAB (in serial programming, debugging and code design). • Solve numerically mathematical problems in linear algebra, • Solve numerically mathematical problems in data interpolation and approximation. • Solve numerically linear and non-linear equations and systems. • Solve numerically problems involving differential algebra, complex numbers, and symbolic algebra. • Design/develop computer code using MATLAB to solve simple problems in engineering and physics. • Develop MATLAB code in order to represent experimental and numerical data using graphs, plots and contours.				
Prerequisites	MAS 029	Required	None		
Course Content	This course concerns teaching the basic principles in computer programming and numerical methods. Through MATLAB, the students will be taught a wide range of topics in numerical methods and analysis in linear algebra, developing graphs and plots, root finding, numerical solution of linear and non-linear systems, interpolation and approximation methods, numerical integration and differentiation, complex numeric algebra, and an introduction using symbolic algebra. Also, a brief introduction programming with FORTRAN will be carried out. This includes teaching material in basic syntax rules and coding in FORTRAN (program structure, basic data types, arrays, variables read/write, etc.) as well as coding subroutines and functions.				
Teaching Methodology	• Class lectures (PowerPoint, Socrative, Screencast-o-matic) • Laboratory lectures – hands-on practice at the computing center • Communicative, Collaborative • During the first week of the semester the students receive the course syllabus, which includes the course content, bibliography, learning outcomes, assessment and office hours.				

Bibliography	• Course notes / slideshow presentation (in English) • Chapra. C.S., *Applied numerical methods with MATLAB: for Engineers & Scientists*. McGraw-Hill. • Βάβαλη, Μ., Τ. Κατελανή. *Ξεκινώντας με το MATLAB*. http://www.mas.ucy.ac.cy/~xenophon/misc/GreekMatlab.pdf (in Greek) • MathWorks®, *Getting Started with MATLAB*. https://www.mathworks.com/help/releases/R2017a/matlab/getting-started-with-matlab.html • Mathews, J.H. and K.D. Fink, *Numerical methods: Using Matlab*. Prentice-Hall. • Ellis, T.M.R., I.R. Philips and T.M. Lahey, *Fortran 90 Programming*. Addison-Wesley.
Assessment	• Midterm exams (x2) 54% • Final exam 46% • Course project assignment 10% For perfect grade the students need 100 points out the total 110.
Language	Greek