



PHD PROGRAM IN APPLIED ENGINEERING

COMPULSORY TRAINING OF THE PHD PROGRAM

Course Title	Matlab. Quantitative research methods
Duration	3 ECTS (75 h)
Type of activity	Tutoring: 15 h Practicals and student's personal work: 60 h
Contents	<ul style="list-style-type: none">- Data Analysis (8h): Fitting and interpolation, two-dimensional and multidimensional- Optimization (4h): two-dimensional, multidimensional, constrained, unconstrained, linear, nonlinear- Dynamical Systems 1 (4h): ODE, numerically and analytically- Dynamical Systems 2 (4h): Simulation of dynamical systems with Simulink- Neural Networks (4h)- User Interfaces with Matlab (4h)
Bibliography	<ul style="list-style-type: none">- Official Mathworks manuals- Hanselman, D.C. & Littlefield, B.L. Mastering MATLAB 7. Prentice Hall.- Dabney, J.B. & Harman, T.L. Mastering SIMULINK. Prentice Hall.- Chapra, S.C. & Canale, R.P. Numerical Methods for Engineers. McGraw-Hill.- Magrab, E.B., Azarm, S., Balachandran, B., Duncan, J., Herold, K. & Walsh, G. An engineer's guide to MATLAB. Prentice Hall, 2011.- Yang, W.Y., Cao, W., Chung, T.S. & Morris, J. (2005). Applied numerical methods using MATLAB. Wiley.
Learning outcomes	<ul style="list-style-type: none">- Demonstrate ability to manage research, technological development, and innovation MHR125- Possess and understand knowledge providing a basis or opportunity to be original in the development and/or application of ideas, often in a research context
Assessment	Assessment will be on a Pass/Fail basis
Timing within the PhD program	Between the 1st and 3rd year of the thesis