University of Cyprus
Department of Mechanical and Manufacturing Engineering

FALL SEMESTER 2022-2023

COURSES IN ENGLISH

Undergraduate courses

15511 MME 307 code Numerical Methods (6 ECTS) This course is an introduction to numerical methods for the solution of real engineering problems. Topics covered include numerical integration and optimization and solution of ordinary and partial differential equations (ODEs and PDEs). Methods that are used for the solution
ODEs include the Implicit and Explicit Euler method, the Runge-Kutta methods and the Adams-Bashforth-Moulton methods. The solution of PDEs is performed with the finite difference method in one and two-dimensions. Both steady state and time-dependent problems are solved. The course also covers a brief introduction to the finite element method. It includes a programming component for writing algorithms for the numerical solutions in FORTRAN and Matlab.

Professor Stylianopoulos Triantafyllos, tstylian@ucy.ac.cy

Tuesday and Friday 9:00-10:0 Latsia building , Room LA 130

11772 MME 325 code Modeling and Analysis of Dynamic Systems (6 ECTS) * Prerequisites: MAS 027 and MME 225 (contact the professor for clarification) The course introduces a unified approach for modeling real dynamic systems. Modeling is accomplished using appropriate graphical or state-space equation models, in order to meet the requirements during the use of the models in design and automatic control. System analysis is used to calculate behavioral characteristics and to evaluate the accuracy of modeling assumptions. Topics taught include lumped parameter models; models with electric, fluid and thermal elements; interfaces; state-space equations; block diagrams; Laplace transforms – transfer functions; time and frequency domain response; stability. Students use Matlab/Simulink as a computational analysis tool. Laboratory exercises are used to identify parameters and demonstrate the interaction between different physical phenomena.

Professor Louka Loukas lslouca@ucy.ac.cy

Monday and Thursday 10:30-12:00 building ΧΩΔ 02 room 112

MME 347 Design and Manufacturing (6 ECTS) Introduction to modern Computer-aided Design and Manufacturing Technology, with emphasis on geometrical aspects (material aspects are covered in the course MME 348). Design by CAD, representation of 2D/3D lines, surfaces and objects, geometric processing by homogeneous transformations. Machining processes, material removal, non-traditional technologies, manufacturing by CAM. Shaping by deformation/flow of foil and bulk material, CAE analysis. Surface patterning by lithography, coating and etching, micro- and nanotechnology. Metrology, microscopy, scanning and machine vision, instruments and image processing. Tolerances, fits, surface quality and defects. Assembly and transportation with automation, robotics and navigation systems. Applications of design and manufacturing systems.

Politis Denis politis.denis@ucy.ac.cy

Monday and Thursday 13:30-15:00 building ΧΩΔ 02 ROOM 116

Master courses

MME 557 Polymer Nanocomposites (8 ECTS) Introduction in polymer nanostructured materials. Overview of different types of nanoparticles introduced within polymer matrices. Selecting the proper polymer-nanoparticle system for specific applications. Synthetic methodstowardsthe fabrication of polymer-based nanocomposites. Characterization of polymer nanomaterials. Properties of polymer nanocomposites/polymer nanostructured materials. Current nanotechnology commercial applications and future directions

Krasia Theodora krasia@ucy.ac.cy

Monday 13:30-16:30 LATSIA building , Room LA 130

MME 566 Advanced SemiconductorMaterials and Nanodevices (8 ECTS) Introduction to semiconductors, intrinsic, n-type and p-type; carrier transport, Hall effect, resistivity, photoconductivity, The infinite quantum well, 3D DOS, Fermi Dirac Statistics, carrier concentration, law of mass action. Temperature dependence of carrier density, mobility, scattering mechanisms. Energy band diagrams, Fermi level and temperature dependence. The p-n junction in equilibrium, forward and reverse biasin the dark and light, the p-n junction photovoltaic device, open circuit voltage, short circuit current, efficiency, fill factor, I- V characteristic, fabrication of p-n junctions. Derivation of 2D and 1D DOS, quantum wells, wires and dots. Nanowires, VLS growth, axial and core-shell, nanowire device fabrication, nanowire solar cells.

Professor Matthew Zervos zervos@ucy.ac.cy
Tuesday and Friday 18:00-19:30 new campus (room not yet announced)

We expect students to use the Online Version of the Learning agreement created though the learning-agreement.eu platform. Person responsible is the Erasmus Departmental Professor Alexandros Syrakos syrakos.alexandros@ucy.ac.cy