

Engineering (ENGR)

ENGR 100 Spatial Visualization 1 Credit (2,0)

Introduction to spatial thinking, graphical representation, and communication; envisioning and analyzing three-dimensional structures using sketching, digital, and physical modeling. Students develop spatial problem-solving skills, sharing ideas, and working in groups.

Course Offered at: Daytona Beach

ENGR 101 Introduction to Engineering 2 Credits (2,0)

Project-based design experience for engineering majors; interdisciplinary aspects of engineering introduced through team projects.

Course Offered at: Daytona Beach, Prescott

ENGR 101W Introduction to Engineering 3 Credits (3,0)

Project-based design experience for engineering majors; interdisciplinary aspects of engineering introduced through team projects.

Prerequisites: MATH 142 or MATH 143 or qualifying score on the mathematics skills assessment

Course Offered at: Worldwide, Asia

ENGR 105 Introductory Problems for Engineering Applications 3 Credits (3,0)

Overview of math topics used in core sophomore-level engineering courses; math topics presented within engineering applications; introduction to MATLAB software.

Corequisites: ENGR 105L

Course Offered at: Daytona Beach

ENGR 105L Introductory Problems for Engineering Applications Laboratory 1 Credit (0,2)

Lab component of ENGR 105; experiments in algebra, trigonometry, vectors, equations, matrices, derivatives, integrals, and differential equations.

Corequisites: ENGR 105

Course Offered at: Daytona Beach

ENGR 115 Introduction to Computing for Engineers 3 Credits (3,0)

Introduction to computer programming for engineers and scientists; algorithm design, problem-solving approaches, software development; data types, looping, decision, input-output, functions, arrays, and files.

Daytona Beach Corequisites: MATH 112 or MATH 241

Worldwide Prerequisites: ENGR 101W

Course Offered at: Daytona Beach, Prescott, Worldwide, Asia

ENGR 120 Graphical Communications 3 Credits (3,0)

Hand-sketched drawings; 3D CAD generated part models and assemblies; ANSI-standard engineering part and assembly drawings, engineering lettering, line types, orthographic projection, isometric, and special views, dimensions and tolerances.

Daytona Beach Prerequisites: PSVTR score 18 or higher or successful completion of ENGR 100

Worldwide Prerequisites: ENGR 101W

Course Offered at: Daytona Beach, Worldwide, Asia

ENGR 199 Special Topics in Engineering 1-6 Credit (1-6,0)

Individual, independent, or directed studies of selected topics in engineering.

Course Offered at: Daytona Beach, Prescott, Worldwide

ENGR 200 Computer Aided Design of Aerospace Systems 3 Credits (3,3)

High-end CAD tools for aerospace systems development and graphical communication; part and assembly drawings, surface design, rapid prototyping methods for aerospace designs.

Course Offered at: Prescott

ENGR 201 Computer Aided Design of Mechanical Systems 3 Credits (3,3)

High-end CAD tools for mechanical system design and documentation; part and assembly drawings, rapid prototyping for mechanical models.

Course Offered at: Prescott

ENGR 299 Special Topics in Engineering 1-6 Credit (1-6,0)

Individual, independent, or directed studies of selected topics in engineering.

Course Offered at: Daytona Beach, Prescott

ENGR 305 Advanced Computer-Aided Design and Analysis 3 Credits (3,0)

Advanced modeling and design using industry-standard CAD software tools. Emphasizes solid and surface modeling, parametric assemblies, and 2D technical documentation. Topics may include design intent, boundary representations, kinematic simulation, structural analysis, and introductory finite element methods. Focus on real-world mechanical design problems, CAD standards, and certification preparation. Software platforms may vary by campus or instructor.

Prerequisites: ENGR 120 and ESCI 201 and ESCI 204

Course Offered at: Daytona Beach

ENGR 310 Advanced Engineering Computation 3 Credits (3,0)

Introduction to numerical computational methods applied to solving practical engineering problems; error analysis and practical applications.

Prerequisites: AE/ME students must have a C or better in ENGR 115 or CPSC 118 or CPSC 125

Corequisites: MATH 345

Course Offered at: Prescott

ENGR 330 Systems and Signal Processing 3 Credits (3,0)

Signal representations; response due to various inputs: using convolution, Fourier series, Fourier transforms, Laplace transforms, Z-transform; filter design.

Prerequisites: ELEC 220

Corequisites: ENGR 330L

Course Offered at: Worldwide, Asia

ENGR 330L Systems and Signal Processing Laboratory 1 Credit (0,1)

Hands-on experience with programming in MATLAB; practical software implementation of theory from ENGR 330; convolution, Fourier series, transforms, and filter design.

Corequisites: ENGR 330

Course Offered at: Worldwide, Asia

ENGR 350 Engineering Project Management 3 Credits (3,0)

Systems thinking and lifecycle considerations in engineering project management; project initiation, planning, monitoring, control, closeout activities, roles in project teams, communication, systematic planning, cost and risk evaluation.

Prerequisites: ENGR 120 and ECON 225

Course Offered at: Worldwide, Asia

ENGR 399 Special Topics in Engineering 1-6 Credit (1-6,0)

Individual, independent, or directed studies of selected topics in engineering.

Course Offered at: Daytona Beach, Prescott, Worldwide

ENGR 400 Fundamentals of Energy Systems 3 Credits (3,0)

Single-phase and three-phase power, magnetic circuits, transformers, DC machines, induction motors, synchronous machines, introduction to alternative energy, and computer-based projects.

Prerequisites: PHYS 160 and ENGR 330

Course Offered at: Worldwide, Asia

ENGR 402 Application of Advanced CATIA Methods 3 Credits (3,0)

Advanced modeling techniques in CATIA; parametric design; surface modeling; assembly creation; simulation tools; design optimization; integration with engineering workflows.

Prerequisites: ENGR 305

Course Offered at: Prescott

ENGR 424 Automation and Rapid Prototyping 3 Credits (3,0)

Rapid prototyping, automated fabrication, CAD model generation, prototyping technologies, automation. Design and fabrication of parts.

Daytona Beach Prerequisites: MECH 304 or AERO 318

Prescott Prerequisites: AE/ME students must have a C or better in MECH 304 or AERO 318

Course Offered at: Daytona Beach, Prescott

ENGR 428 Design for Manufacturing and Assembly 3 Credits (3,0)

Manufacturing processes, life cycle design for aerospace. Tolerances, materials properties, design for manufacturing costs (machining, casting, molding, forging, extrusion); product assembly design; computer simulations, case studies, project.

Daytona Beach Prerequisites: MATH 345 and MECH 304 or AERO 318

Course Offered at: Daytona Beach, Prescott

ENGR 450 Systems and Controls 3 Credits (3,0)

Design of controllers for dynamic systems; classical and modern control using state space; digital control, optimal control, observability, and controllability; MATLAB and Simulink.

Prerequisites: ENGR 330

Course Offered at: Worldwide, Asia

ENGR 490 Capstone Design Project I 3 Credits (3,0)

First course in senior-level engineering design sequence; system requirements, design space exploration, conceptual design development using computer-based tools.

Prerequisites: MATH 412 and AERO 309 and ENGR 330 and ENGR 350 and ENGR 450 and ESCI 324 and ESCI 326 and MECH 370 and MECH 470

Course Offered at: Worldwide, Asia

ENGR 491 Capstone Design Project II 3 Credits (3,0)

Final course in the capstone design sequence; detailed design, verification, validation, system performance comparison with specifications.

Prerequisites: ENGR 490

Course Offered at: Worldwide, Asia

ENGR 499 Special Topics in Engineering 1-6 Credit (1-6,0)

Individual, independent, or directed studies of selected topics in engineering.

Course Offered at: Daytona Beach, Prescott, Worldwide