Engineering Core (ECOR) Courses

ECOR 1010 [0.5 credit]
Introduction to Engineering
Technology, society and the environment. Graphical design communication: sketching, graphical projections; CAD. Managing data: statistical methods; spreadsheets. Design analysis: matrix programming software; symbolic computer algebra systems. Design process: proposals; reports; presentations; reporting software.
Includes: Experiential Learning Activity
Precludes additional credit for ECOR 1000 (no longer offered), ECOR 1047, ECOR 1054.
Lectures four hours per week, laboratories two hours per week.

ECOR 1041 [0.25 credit]
Computation and Programming
Precludes additional credit for COMP 1005, COMP 1405, ECOR 1051, ECOR 1606, SYSC 1005.
Prerequisite(s): This course may not be taken concurrently with ESLA 1300 or ESLA 1500.
Lectures three hours per week, laboratories three hours per week.

ECOR 1042 [0.25 credit]
Data Management
Precludes additional credit for COMP 1005, COMP 1405, ECOR 1051, ECOR 1606, SYSC 1005.
Prerequisite(s): ECOR 1041 with a minimum grade of C- and ECOR 1043 with a minimum grade of C-. This course may not be taken concurrently with ESLA 1300 or ESLA 1500.
Lectures three hours per week, laboratories three hours per week.

ECOR 1043 [0.25 credit]
Circuits
Precludes additional credit for ECOR 1052.
Prerequisite(s): This course may not be taken concurrently with ESLA 1300 or ESLA 1500.
Lectures three hours per week, laboratories three hours per week.

ECOR 1044 [0.25 credit]
Mechatronics
Precludes additional credit for ECOR 1052.
Prerequisite(s): ECOR 1041 with a minimum grade of C- and ECOR 1043 with a minimum grade of C-. This course may not be taken concurrently with ESLA 1300 or ESLA 1500.
Lectures three hours per week, laboratories three hours per week.

ECOR 1045 [0.25 credit]
Statics
Precludes additional credit for ECOR 1053, ECOR 1101.
Prerequisite(s): This course may not be taken concurrently with ESLA 1300 or ESLA 1500.
Lectures three hours per week, laboratories three hours per week.

ECOR 1046 [0.25 credit]
Mechanics
2D truss analysis (method of joints/sections). Normal stress/strain and shear stress/strain. 2D frames and machines. Internal loads - normal, shear and moment at a point. Shear and moment diagrams.
Precludes additional credit for ECOR 1053.
Prerequisite(s): ECOR 1045 with a minimum grade of C-. This course may not be taken concurrently with ESLA 1300 or ESLA 1500.
Lectures three hours per week, laboratories three hours per week.
ECOR 1047 [0.25 credit]
Visual Communication
Graphs and sketches, flow charts, block diagrams. Visual presentation, projection and perspectives of objects. 3D sketching. Free hand drawing. Reading engineering drawings and schematics. Introduction to scaling, dimensioning and tolerancing. Introduction to CAD. Precludes additional credit for ECOR 1054, ECOR 1010. Prerequisite(s): This course may not be taken concurrently with ES LA 1300 or ES LA 1500. Lectures three hours per week, laboratories three hours per week.

ECOR 1048 [0.25 credit]
Dynamics
Kinematics and kinetics of a particle. Principle of work and energy. Conservation of energy, conservative forces, potential energy. Principles of impulse and momentum, conservation of momentum for a system of particles. Precludes additional credit for ECOR 1054, ECOR 1101. Prerequisite(s): ECOR 1045 with a minimum grade of C-. This course may not be taken concurrently with ESLA 1300 or ESLA 1500. Lectures three hours per week, laboratories three hours per week.

ECOR 1050 [2.0 credits]
Foundations of Engineering
Foundations of engineering analysis and problem solving, the design process, project management and team work. Modules covering Engineering Profession (Act, Law and Practice); Visual Communication; Statics; Mechanics; Dynamics; Electronics; Computing; Data Management; and Mechatronics. Most modules are project based. Precludes additional credit for ECOR 1010, ECOR 1101, ECOR 1606, and ECOR 2606. Prerequisite(s): This course may not be taken concurrently with ESLA 1300 or ESLA 1500. Lectures three hours per week, laboratories three hours per week.

ECOR 1051 [0.5 credit]
Fundamentals of Engineering I
Software development as an engineering discipline, using a modern programming language. Tracing and visualization of program execution. Testing and debugging. Data management: digital representation of numbers; numerical algorithms; storing data in files; container data types: sequences, sets, maps. Includes: Experiential Learning Activity Precludes additional credit for COMP 1005, COMP 1405, ECOR 1041, ECOR 1042, ECOR 1606, SYSC 1005. Prerequisite(s): This course may not be taken concurrently with ES LA 1300 or ES LA 1500. Lectures three hours per week, laboratories three hours per week.

ECOR 1052 [0.5 credit]
Fundamentals of Engineering II

ECOR 1053 [0.5 credit]
Fundamentals of Engineering III
Components of forces. Particle equilibrium and free body diagrams. Moments and cross product. Centre of gravity and centroids. Rigid body equilibrium. 2D Truss analysis (method of joints/sections). Normal stress/strain and Shear stress/strain. 2D frames and machines. Includes: Experiential Learning Activity Precludes additional credit for ECOR 1045, ECOR 1046, ECOR 1101. Prerequisite(s): This course may not be taken concurrently with ESLA 1300 or ESLA 1500. Lectures three hours per week, laboratories three hours per week.

ECOR 1054 [0.5 credit]
Fundamentals of Engineering IV

ECOR 1055 [0.0 credit]
Introduction to Engineering Disciplines I
Overview of professional activities oriented to the student's discipline of study: Architectural Conservation and Sustainability. Civil and Environmental. Aerospace and Mechanical. Electrical. Engineering Physics. Computer Systems, Communications and Software. Biomedical (Electrical and Mechanical). Sustainable and Renewable Energy. Prerequisite(s): This course may not be taken concurrently with ESLA 1300 or ESLA 1500. Lectures 1.5 hours per week.
ECOR 1056 [0.0 credit]
Introduction to Engineering Disciplines II
Selected lectures designed to provide students with exposure to the breadth of Engineering disciplines. Online course.

ECOR 1057 [0.0 credit]
Engineering Profession

ECOR 1101 [0.5 credit]
Mechanics I

ECOR 1606 [0.5 credit]
Problem Solving and Computers
Introduction to engineering problem solving. Defining and modeling problems, designing algorithmic solutions, using procedural programming, selection and iteration constructs, functions, arrays, converting algorithms to a program, testing and debugging. Program style, documentation, reliability. Applications to engineering problems; may include numerical methods, sorting and searching. Includes: Experiential Learning Activity. Prerequisite(s): SYSC 2606 (no longer offered). Lectures three hours a week, laboratory one hour a week.

ECOR 2050 [0.5 credit]
Design and Analysis of Engineering Experiments
Statistics and the design of engineering experiments. Basic exploratory data analysis. Central limit theorem. Hypothesis testing: t-test, chi-square test, type-I and type-II errors, multiple-comparison problem. Statistical bias. Design of experiments: randomization, blocking and replication, randomized blocking designs, factorial design. Statistical software packages. Includes: Experiential Learning Activity. Prerequisite(s): 2nd Year Status in Engineering. Lectures three hours a week, problem analysis and laboratory three hours a week.

ECOR 2606 [0.5 credit]
Numerical Methods
Numerical algorithms and tools for engineering and problem solving. Sources of error and error propagation, solution of systems of linear equations, curve fitting, polynomial interpolation and splines, numerical differentiation and integration, root finding, solution of differential equations. Software tools. Includes: Experiential Learning Activity. Prerequisite(s): MATH 1005 and (ECOR 1606 or SYSC 1005) and (ECOR 1010 or ELEC 1908). Lectures three hours a week.

ECOR 2995 [0.0 credit]
Engineering Portfolio
Students will be asked to reflect on their skills, strengths and weaknesses as preparation for the professional practice course. Engineering students must submit samples of their writing and communications (including, for example, laboratory reports and professional memos). Online.

ECOR 3800 [0.5 credit]
Engineering Economics
Introduction to engineering economics; cash flow calculations; methods of comparison of alternatives; structural analysis; replacement analysis; public projects; depreciation and income tax; effects of inflation; sensitivity analysis; break-even analysis; decision making under risk and uncertainty. Prerequisite(s): third-year status in Engineering or (ECOR 1051, ECOR 1052, ECOR 1053 and ECOR 1054). Lectures three hours a week.
ECOR 4995 [0.5 credit]

Professional Practice
Presentations by faculty and external lecturers on the Professional Engineers Act, professional ethics and responsibilities, practice within the discipline and its relationship with other disciplines and to society, health and safety, environmental stewardship, principles and practice of sustainable development. Communication skills are emphasized.
Precludes additional credit for MAAE 4905, CIVE 4905, SYSC 3905 or ELEC 3905 (all no longer offered).
Prerequisite(s): ECOR 2995 and fourth-year status in Engineering.
Lectures three hours a week.