Engineering Core
(ECOR)

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
Software development as an engineering discipline, using
a modern programming language. Language syntax and
semantics. Tracing and visualizing program execution.
Program style and documentation. Testing and debugging
tools and techniques.
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
Introduction to designing and implementing numerical
algorithms. Container data types: sequences, sets, maps.
Modules. Data files. Incremental, iterative development
of programs. Number systems: binary, decimal. Digital
representation of integers and floating point numbers.
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 MATH 1004 (may be taken concurrently). 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
Electrical Quantities (Voltage, Charge, Current, Power).
Conservation of charge and energy. Mathematical models
of simple devices. Elementary circuit theory for passive
elements. Thévenin’s and superposition theorem. Signal
filtering and amplification. Time and frequency domain.
Circuit design and simulation.
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
Mechatronics applications. Analog to digital signal
conversion. Control systems and PID controllers.
Input devices, including sensors. Data collection and
processing. Output devices, including displays, actuators,
and motors. Project design and economics. Environmental
Impact of mechatronics engineering. System failures and
failsafe design.
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
Cartesian vector representation of forces. Components
of forces. Particle equilibrium and free body diagrams.
Moments and cross product. Centre of gravity and
centroids. Rigid body equilibrium.
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 ESLA 1300 or ESLA 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 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 ESLA 1300 or ESLA 1500.
Lectures three hours per week, laboratories three hours per week.

ECOR 1052 [0.5 credit]
Fundamentals of Engineering II
Precludes additional credit for ECOR 1043, ECOR 1044.
Prerequisite(s): ECOR 1051 (may be taken concurrently).
Lectures three hours per week, laboratories three hours per week.

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
Precludes additional credit for ECOR 1010, ECOR 1047, ECOR 1048.
Prerequisite(s): ECOR 1053 (may be taken concurrently).
Lectures three hours per week, laboratories three hours per week.

ECOR 1055 [0.0 credit]
Introduction to Engineering Disciplines I
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
Includes: Experiential Learning Activity
Precludes additional credit for ECOR 1045, ECOR 1048, ECOR 1053.
Prerequisite(s): MATH 1004 and MATH 1104.
Lectures three hours a week, tutorials and problem analysis three hours a week.

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
Precludes additional credit for SYSC 1005, SYSC 1100 (no longer offered), COMP 1005, COMP 1405, ECOR 1041, ECOR 1042, ECOR 1051.
Lectures three hours a week, laboratory three hours a week.

ECOR 2050 [0.5 credit]
Design and Analysis of Engineering Experiments
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
Precludes additional credit for SYSC 2606 (no longer offered).
Prerequisite(s): MATH 1005 and (ECOR 1606 or SYSC 1005) and (ECOR 1010 or ELEC 1908).
Lectures three hours a week, laboratory one hour 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).

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.