

Engineering Physics Approved Technical Elective List

There are 3 categories of Technical Electives that are listed on the following pages:

- a) Courses from Engineering Physics
- b) (List 1) Courses outside of the Faculty of Engineering
- c) (List 2) Engineering courses within the Faculty of Engineering (excluding courses from Engineering Physics).

Please check the Undergraduate Calendar for the year you entered the program to determine the number of technical electives you are required to take in each category.

Subject to approval of the Engineering Physics Department, courses not appearing on these lists may also qualify as acceptable technical electives.

- Note that Engineering Physics does not schedule courses outside of the Department and has no mechanism to ensure they are scheduled conflict-free with Engineering Physics courses.
- Students are responsible for ensuring that they can take the elective course conflict-free or seek permission to take them despite the conflict, using the [Course Conflict Form](#).
- Students are responsible for ensuring that they fulfill the prerequisites for each elective course or that they receive permission from the Department offering each elective course (for courses outside of Engineering Physics).

Courses from Engineering Physics

Subject to approval of the Engineering Physics Department, students may replace Engineering Physics technical electives with approved Engineering courses.

CODE	TITLE
ENGPHY 3D03	Principles of Nuclear Engineering
ENGPHY 3E03	Fundamentals of Physical Optics
ENGPHY 3ES3	Introduction to Energy Systems
ENGPHY 3F03	Advanced Applications of Quantum Mechanics
ENGPHY 3G04 A/B	Photonics Instrumentation
ENGPHY 3H04 A/B S	Research Project in Engineering Physics
ENGPHY 3O04	Introduction to Fluid Mechanics and Heat Transfer
ENGPHY 3PN4	Semiconductor Junction Devices
ENGPHY 4D03	Nuclear Reactor Physics
ENGPHY 4H04 A/B S	Research Project in Engineering Physics
ENGPHY 4I03	Introduction to Biophotonics
ENGPHY 4MD3	Nanoscale Semiconductor Devices
ENGPHY 4NE3	Advanced Nuclear Engineering
ENGPHY 4P03	Nuclear Power Plant Systems and Operation
ENGPHY 4PP3	Plasma Physics Applications
ENGPHY 4QC3	Introduction to Quantum Computing
ENGPHY 4S03	Lasers and Electro-Optics
ENGPHY 4X03	Introduction to Photovoltaics
ENGPHY 4Z03	Semiconductor Manufacturing Technology

(List 1) Courses outside of the Faculty of Engineering

Subject to approval of the Engineering Physics Department, courses not appearing on this list may also qualify as acceptable technical electives.

CODE	TITLE
BIOCHEM 2B03	Nucleic Acid Structure and Function
BIOCHEM 2BB3	Protein Structure and Enzyme Function
BIOCHEM 2EE3	Metabolism and Physiological Chemistry
BIOCHEM 3BP3	Practical Bioinformatics in the Genomics Era
BIOCHEM 3D03	Metabolism and Regulation
BIOCHEM 3G03	Proteins and Nucleic Acids
BIOCHEM 3H03	Clinical Biochemistry
BIOCHEM 4E03	Gene Regulation in Stem Cells and Development
BIOCHEM 4H03	Biotechnology and Drug Discovery
BIOCHEM 4J03	Immunological Principles in Practice
BIOCHEM 4M03	Cellular and Integrated Metabolism
BIOCHEM 4N03	Molecular Membrane Biology
BIOCHEM 4Q03	Biochemical Pharmacology
BIOLOGY 1A03	Cellular and Molecular Biology
BIOLOGY 2A03	Integrative Physiology of Animals
BIOLOGY 2B03	Cell Biology
BIOLOGY 2C03	Genetics
BIOLOGY 2EE3	Introduction to Microbiology and Biotechnology
MOLBIO 3B03	Advanced Cell Biology
BIOLOGY 4T03	Neurobiology
BIOLOGY 3P03	Cell Physiology
BIOLOGY 3VV3	Laboratory Methods in Molecular Biology
BIOLOGY 4PP3	Environmental Microbiology and Biotechnology
BIOPHYS 3D03	Origin of Life
BIOPHYS 3G03	Modelling Life
BIOPHYS 3S03	Soft Condensed Matter Physics
BIOPHYS 4S03	Introduction to Molecular Biophysics
CHEM 1AA3	Introductory Chemistry II
CHEM 2OA3	Organic Chemistry I
CHEM 2OB3	Organic Chemistry II
CHEM 2E03	Introductory Organic Chemistry
MATH 2R03	Linear Algebra II

CODE	TITLE
MATH 3A03	Introduction to Real Analysis
MATH 3B03	Geometry
MATH 3C03	Mathematical Physics I
MATH 3CY3	Cryptography
MATH 3D03	Mathematical Physics II
MATH 3DC3	Discrete Dynamical Systems and Chaos
MATH 3GR3	Abstract Algebra
MATH 3H03	Number Theory
MATH 3QC3	Introduction to Quantum Computing
MATH 3TP3	Truth and Provability: Gödel's Incompleteness Theorems
MATH 3U03	Combinatorics
MATH 3V03	Graph Theory
MATH 4A03	Real Analysis II
MATH 4AT3	Topics in Analysis
MATH 4B03	Calculus on Manifolds
MATH 4BT3	Topics in Geometry
MATH 4E03	Galois Theory
MATH 4ET3	Topics in Algebra
MATH 4FM3	Financial Markets and Derivatives
MATH 4FT3	Topics in Differential Equations (Stability and Bifurcations)
MATH 4GR3	Groups and Rings
MATH 4L03	Introduction to Mathematical Logic
MATH 4LT3	Topics in Logic
MATH 4MB3	Mathematical Biology
MATH 4NA3	Numerical Methods for Differential Equations
MATH 4TT3	Topics in Topology
MATH 4W03	Reading in Mathematics
MATH 4WW3	Reading in Mathematics II
MATH 4X03	Complex Analysis II
MEDPHYS 3C03	Operational Health Physics: Laboratory & Communication
MEDPHYS 4B03	Radioactivity and Radiation Interactions
MEDPHYS 4D03	Imaging in Medicine and Biology
MEDPHYS 4F03	Fundamentals of Health Physics
MEDPHYS 4RA3	Radiation and Radioisotope Methodology I
MEDPHYS 4RB3	Radiation and Radioisotope Methodology II
MEDPHYS 4T03	Clinical Applications of Physics in Medicine

CODE	TITLE
MEDPHYS 4U03	Radiation Biology
PHYS 3A03	Relativity
PHYS 3C03	Analytical Mechanics
PHYS 3MM3	Quantum Mechanics I
PHYS 3QI3	Quantum Information
PHYS 4B03	Electromagnetic Theory
PHYS 4E03	Particle and Nuclear Physics
PHYS 4F03	Quantum Mechanics II
PHYS 4G03	Computational Physics
PHYS 4K03	Solid State Physics
PHYS 4Q03	Quantum Field Theory
STATS 2D03	Introduction to Probability
STATS 2MB3	Statistical Methods and Applications
STATS 3A03	Applied Regression Analysis with SAS
STATS 3D03	Mathematical Statistics
STATS 4A03	Time Series
STATS 4C03	Generalized Linear Models
STATS 4CI3	Computational Methods for Inference
STATS 4D03	Intermediate Probability Theory
STATS 4I03	Inference
STATS 4M03	Multivariate Analysis
STATS 4P03	Advanced Applied Statistics

(List 2) Engineering courses within the Faculty of Engineering (excluding courses from Engineering Physics).

Subject to approval of the Engineering Physics Department, courses not appearing on this list may also qualify as acceptable technical electives.

CODE	Title
CHEMENG 3D03	Chemical Engineering Thermodynamics
CHEMENG 3K04	Introduction to Reactor Design
CHEMENG 3M04	Mass Transfer and Stagewise Operations
CHEMENG 3Q03	Introduction to Polymer Science
CHEMENG 4B03	Polymer Reaction Engineering
CHEMENG 4K03	Reactor Design for Heterogeneous Systems
CHEMENG 4M03	Industrial Separation Processes
CHEMENG 4T03	Applications of Chemical Engineering in Medicine
CHEMENG 4X03	Polymer Processing
CHEMENG 4Z03	Interfacial Engineering
CIVENG 2B04	Principles of Environmental Engineering
CIVENG 2J04	Principles of Geological and Geoenvironmental Engineering
CIVENG 3A03	Geotechnical Engineering I
CIVENG 3B03	Geotechnical Engineering II
CIVENG 3G04	Structural Analysis
CIVENG 3J04	Reinforced Concrete Design
CIVENG 3K03	Introduction to Transportation Engineering
CIVENG 3L03	Water Quality
CIVENG 3M03	Municipal Hydraulics
CIVENG 3P04	Civil Engineering Materials and Design
CIVENG 4A04	Engineering Hydrology
CIVENG 4BP4	Building Science
CIVENG 4ED4	Seismic Design of Structures
CIVENG 4G04	Pavement Materials and Design
CIVENG 4K04	Modern Methods of Structural Analysis
CIVENG 4L04	Design of Water Resources Systems
CIVENG 4N04	Steel Structures
CIVENG 4S04	Foundation Engineering
CIVENG 4SD4	Structural Dynamics and Earthquake Engineering
CIVENG 4T04	Transportation Engineering II - Modelling Transit and ITS
CIVENG 4V04	Biological Aspects of Wastewater Treatment

CODE	Title
CIVENG 4W04	Design of Low Rise Buildings
CIVENG 4Y04	Bridges and Other Structural Systems
COMPENG 2SH4	Principles of Programming
COMPENG 2SI4	Data Structures, Algorithms, and Discrete Mathematics
COMPENG 3DQ5	Digital Systems Design
COMPENG 3DR4	Computer Organization
COMPENG 4DK4	Computer Communication Networks
COMPENG 4DM4	Computer Architecture
COMPENG 4DN4	Advanced Internet Communications
COMPENG 4DS4	Embedded Systems
COMPENG 4EK4	Microelectronics
COMPENG 4TL4	Digital Signal Processing
COMPENG 4TN4	Image Processing
COMPSCI 4TI3	Fundamentals of Image Processing
ELECENG 3BA3	Structure of Biological Materials
ELECENG 3BB3	Cellular Bioelectricity
ELECENG 3CL4	Introduction to Control Systems
ELECENG 3FK4	Electromagnetics II
ELECENG 3PI4	Energy Conversion
ELECENG 3TR4	Communication Systems
ELECENG 4BC3	Modelling of Biological Systems
ELECENG 4BD4	Biomedical Instrumentation
ELECENG 4BE4	Medical Robotics
ELECENG 4BF4	Medical Imaging
ELECENG 4CL4	Control System Design
ELECENG 4EM4	Photonic Devices and Systems
ELECENG 4FJ4	Devices and Antennas for Wireless Systems
ELECENG 4PK4	Power Electronics
ELECENG 4PL4	Energy Systems and Management
ELECENG 4PM4	Electrical Power Systems
ELECENG 4TK4	Digital Communications Systems
ELECENG 4TM4	Digital Communications II
ENGINEER 4EX3 A/B	Experiential Engineering Design
MATLS 2D03	Thermodynamics of Alloys and Phase Diagrams
MATLS 2X03	Crystalline Structure of Materials
MATLS 3B03	Materials Production

CODE	Title
MATLS 3C03	Applied Thermodynamics
MATLS 3E04	Mass Transfer
MATLS 3F03	High-Temperature Materials Production
MATLS 3M03	Mechanical Behaviour of Materials
MATLS 3Q03	Materials for Electronic Applications
MATLS 3T04	Phase Transformations
MATLS 4B03	Biomechanics and Tissue Engineering
MATLS 4C03	Modern Iron and Steelmaking
MATLS 4D03	Corrosion
MATLS 4FF3	Synthesis, Applications, and Environmental Impact of Nanomaterials
MATLS 4G03	Characterization of Nanomaterials
MATLS 4H03	Thin Film Science and Engineering
MATLS 4I03	Sustainable Manufacturing Processes
MATLS 4NN3	Computational Modelling in Materials Engineering
MATLS 4P03	Properties of Polymeric Materials
MATLS 4Q03	Advanced Functional Materials
MATLS 4T03	Properties and Processing of Composites
MECH ENG 4E03	Microelectromechanical Systems (MEMS)
MECH ENG 4J03	Introduction to Computational Fluid Mechanics and Heat Transfer
MECH ENG 4O04	Sustainable Energy Systems
MECH ENG 4R03	Control Systems
MECH ENG 4S03	Incompressible Flow
MECH ENG 4U03	Compressible Flow and Turbomachinery
MECH ENG 4V03	Thermo-Fluids Systems Design and Analysis
MECH ENG 4W03	Air Conditioning and Refrigeration Systems
MECH ENG 4Y03	Internal Combustion Engines
MECHENG 3A03	Engineering Mechanics
MECHENG 3C03	Manufacturing Engineering
MECHENG 3E05	Mechanical Engineering Design II
MECHENG 4BB3	Biomechanics
MECHENG 4C03	Production Systems Engineering
MECHENG 4CC3	Experimental and Computational Biomechanics
MECHENG 4D03	Manufacturing Processes (Metal Removal)
MECHENG 4H03	Mechatronics
MECHENG 4I03	Noise Analysis and Control
MECHENG 4K03	Robotics

CODE	Title
MECHENG 4L03	Industrial Design
MECHENG 4N03	Nanobio Engineering
MECHENG 4Q03	Mechanical Vibrations
MECHENG 4T03	Finite Element Applications
MECHENG 4Z03	CAD/CAM/CAE
SFWRENG 2MD3	Data Structures, Algorithms, and Language Concepts for Mechatronics
SFWRENG 2MP3	Programming for Mechatronics
SFWRENG 3DB3	Databases
SFWRENG 3FP3	Functional Programming
SFWRENG 3GC3	Computer Graphics
SFWRENG 3K04	Software Development
SFWRENG 3O03	Linear Optimization
SFWRENG 3SH3	Operating Systems
SFWRENG 4AA4	Real-Time Systems and Control Applications
SFWRENG 4AD3	Advanced Databases
SFWRENG 4C03	Computer Networks and Security
SFWRENG 4E03	Performance Analysis of Computer Systems
SFWRENG 4F03	Parallel Computing
SFWRENG 4J03	Communications Systems
SFWRENG 4TE3	Continuous Optimization Algorithms
SFWRENG 4TH3	Theory of Computation