2007 / 2008 CURRICULUM - COMPUTER ENGINEERING

ENTRY FROM CEGEP **Total credits:** **110**

First (Fall) Semester		15 credits
CIVE 281	**Analytical Mechanics**	(3 cr, C - MATH 262 & MATH 263)
COMP 202	**Introduction to Computing 1**	(3 cr)
MATH 262	**Intermediate Calculus**	(3 cr, P-MATH 141 & MATH 133 or equiv)
MATH 263	**Ord. Differential Eqns. & Linear Alg.**	(3 cr, C - MATH 262)
XXXX xxx g1	General Complementary 1	(3 cr)

Second (Winter) Semester		17 credits
COMP 250	**Introduction to Computer Science**	(3 cr)
ECSE 200	**Fundamentals of Elect. Eng.**	(3 cr, P - PHYS 142 or CEGEP Equivalent; C - MATH 263)
ECSE 221	**Intro. to Computer Engineering**	(3 cr, P - COMP 202)
MATH 264	**Advanced Calculus**	(3 cr, P - MATH 262 or MATH 151 or MATH 152 or equiv)
MATH 270	**Applied Linear Algebra**	(3 cr, P - MATH 263)
MIME 221	**Engineering Professional Practice**	(2 cr)

Third (Fall) Semester		14 credits
ECSE 210	**Circuit Analysis**	(3 cr, P - ECSE 200)
ECSE 211	**Design Methodology and Principles**	(3 cr, C - ECSE 291, P - ECSE 200 & COMP 202)
ECSE 291	**Electrical Measurements Lab**	(2 cr, C - ECSE 210)
ECSE 322	**Computer Engineering**	(3 cr, P - ECSE 221 & ECSE 200 or MECH 383)
XXXX xxx	Basic Science Complementary	(3 cr)

Fourth (Winter) Semester		15 credits
ECSE 306	**Fundamentals of Signals & Systems**	(3 cr, P - ECSE 210 & MATH 270 or MATH 271)
ECSE 321	**Intro. to Software Engineering**	(3 cr, P - COMP 202 or COMP 208)
ECSE 330	**Introduction to Electronics**	(3 cr, P - ECSE 210)
EDEC 206	**Communication in Engineering**	(3 cr)
MATH 363	**Discrete Mathematics**	(3 cr, P - MATH 263 & MATH 264)

Fifth (Fall) Semester		17 credits
COMP 431	**Algorithms for Engineers**	(3 cr, P - ECSE 322 & MATH 363)
ECSE 305	**Probability & Random Signals 1**	(3 cr, P - ECSE 303 or ECSE 306)
ECSE 323	**Digital Systems Design**	(5 cr, P - EDEC 206, ECSE 221 & ECSE 291)
ECSE 353	**Electromagnetic Fields & Waves**	(3 cr, P - MATH 264 & ECSE 210)
ECSE 427	**Operating Systems**	(3 cr, P - ECSE 322 or COMP 273)

Sixth (Winter) Semester		16 credits
COMP 535	**Computer Networks 1**	(3 cr, P - COMP 310)
or ECSE 414	**Intro. to Telecom Networks**	(3 cr, P - ECSE 304 or ECSE 306 & ECSE 322)
ECSE 334	**Introduction to Microelectronics**	(3 cr, P - ECSE 291, ECSE 330 & ECSE 303 or ECSE 306)
ECSE 425	**Computer Org. & Architecture**	(3 cr, P - ECSE 322 & ECSE 323)
ECSE 426	**Microprocessor Systems**	(3 cr, P - ECSE 323 & EDEC 206)
ECSE 474	**Design Project 1**	(1 cr, P - EDEC 206, ECSE 211 & 42 departmental credits)
ECSE 4xx t1	Technical Complementary 1	(3 cr)

Seventh (Fall) Semester		16 credits
ECSE 475	**Design Project 2**	(2 cr, P - ECSE 474)
MIME 310	**Engineering Economy**	(3 cr)
XXXX xxx t2	Technical Complementary 2	(3 cr)
XXXX xxx t3	Technical Complementary 3	(3 cr)
ECSE 4xx	Lab Complementary	(2 cr or 3 cr)
XXXX xxx g2	General Complementary 2	(3 cr)

All courses are core courses except for Complementaries (Technical, General, Lab, Basic Science). Core courses are shown in boldface above. All core courses must be passed with a grade "C" or better. Also, a grade of "C" is required for an ECSE xxx core course in order to proceed with its follow-on ECSE xxx course(s), and a grade of "C" is required for a MATH xxx course in order to proceed with its follow-on MATH xxx course(s). A grade of "D" is only acceptable for non-core courses.

Technical Complementary courses are selected from the list given on the next page.

The Lab Complementary course is normally taken in conjuction with a technical complementary.

General Complementary courses must be chosen according to the rules in Section 8.3.4 of the 2007-2008 McGill University Calendar, page 225.

The Basic Science Complementary course must be selected from the attached list (see last page).

This sample curriculum is for students who wish to complete their degree requirements in 7 semesters. Students may, at any time, deviate from this structure. However, it is the student's responsibility to devise a study plan that has no course conflicts or prerequisite/corequisite violations. Academic advisors are available for help with course selection.

Revised June 2007

TECHNICAL AND LAB COMPLEMENTARY COURSES - COMPUTER ENGINEERING PROGRAM

Technical Complementaries (3 courses) 9 credits

Students following the Computer Engineering program must take 3 courses (9 credits) from the following lists. One course must be chosen from List A, and 2 courses must be chosen from List B. It is possible that not all the courses listed will be offered in any given year. Please refer to the up-to-date course assignments before selecting any course. Permission will not be granted to take Technical Complementary courses that are not on this list.

Computer Engineering Technical Complementaries - LIST A:

Course	Course Title	Pre-Requisites and Co-Requisites
ECSE 424	Human-Computer Interaction	(3 cr, P - ECSE 322)
ECSE 428	Software Engineering Practice	(3 cr, P - ECSE 321 or COMP 335)
ECSE 431	Introduction to VLSI CAD.	(3 cr, P - ECSE 323 & ECSE 330)

Computer Engineering Technical Complementaries - LIST B:

Course	Course Title	Pre-Requisites and Co-Requisites
ECSE 404	Control Systems	(3 cr, C - ECSE 304 or ECSE 306)
ECSE 411	Communications Systems 1	(3 cr, P - ECSE 305 & ECSE 304 or ECSE 306)
ECSE 412	Discrete-Time Signal Processing	(3 cr, P - ECSE 304 or ECSE 306)
ECSE 420	Parallel Computing	(3 cr, P - ECSE 427)
ECSE 421	Embedded Systems	(3 cr, P - ECSE 322 & ECSE 323)
ECSE 422	Fault Tolerant Computing	(3 cr, P - ECSE 322)
ECSE 429	Software Validation	(3 cr, P - ECSE 321)
ECSE 436	Signal Processing Hardware	(3 cr, P - ECSE 322, ECSE 323 & ECSE 304 or ECSE 306)
ECSE 443	Numerical Methods in Elect. Eng.	(3 cr, P - ECSE 221, ECSE 330 & ECSE 351 or ECSE 353)
ECSE 450	Electromagnetic Compatability	(3 cr, P- ECSE 221, ECSE 334 & ECSE 352 or ECSE 353)
ECSE 526	Artificial Intelligence	(3 cr, P - ECSE 322)
or COMP 424	Topics: Atrificial Intelligence 1	(3 cr, P - COMP 206, COMP 251 & COMP 302)
ECSE 530	Logic Synthesis	(3 cr, P - ECSE 323)
ECSE 532	Computer Graphics	(3 cr, P - ECSE 322)
ECSE 548	Introduction to VLSI Systems	(3 cr, P - ECSE 323 & ECSE 334)

Laboratory Complementary (one course) 2 credits

Students following the regular Computer Engineering program must take one course (2 credits) from the following list. It is possible that not all the courses listed will be offered in any given year. Please refer to the up-to-date course assignments before selecting any course. Permission will not be granted to take Laboratory Complementary courses that are not on this list.

Course	Course Title	Pre-Requisites and Co-Requisites
ECSE 434	Microelectronics Laboratory	(2 cr, P - EDEC 206, ECSE 334)
ECSE 487	Computer Architecture Laboratory	(2 cr, P - EDEC 206; C- ECSE 425 or ECSE 525)
ECSE 489	Telecommunication Network Laboratory	(2 cr, P - EDEC 206; C - ECSE 414 or ECSE 528 or COMP 535)
ECSE 490	Digital Signal Processing Lab	(2 cr, P - ECSE 291 & EDEC 206; C- ECSE 412 or ECSE 512)
ECSE 491	Communications Systems Lab	(2 cr, P - EDEC 206 & ECSE 291;C- ECSE 411 or ECSE 511)
ECSE 493	Control & Robotics Lab	(2 cr, P - EDEC 206 & ECSE 291;C- ECSE 404 or ECSE 501)

BASIC SCIENCE COMPLEMENTARY COURSES - COMPUTER ENGINEERING PROGRAM

Students following the Computer Engineering Program (CEGEP entry) must take 3 credits (1 course) from the following list:

PHYS 230 Dynamics of Simple Systems.
(3) (Fall) (3 hours lectures) (Prerequisite: CEGEP physics.) (Corequisite: MATH 222) (Restriction: Not open to students taking or having passed PHYS 251) Translational motion under Newton's laws; forces, momentum, work/energy theorem. Special relativity; Lorentz transforms, relativistic mechanics, mass/energy equivalence. Topics in rotational dynamics. Noninertial frames.

PHYS 242 Electricity and Magnetism.
(2) (Winter) (2 hours lectures) (Prerequisites: CEGEP Physics, MATH 222) Properties of electromagnetic fields, dipole and quadropole fields and their interactions, chemical binding of molecules, electromagnetic properties of materials, Maxwell's equations and properties of electromagnetic waves, propagation of waves in media.

PHYS 260 Modern Physics and Relativity.
(3) (Fall) (3 hours lectures) (Corequisite: MATH 222) History of special relativity; Lorentz transformations: kinematics and dynamics; transformation of electric and magnetic forces; introduction to topics in modern physics.

CHEM 201 Modern Inorganic Chemistry 1.
(3) (Fall) (3 lectures) (Prerequisites: CHEM 110 and CHEM 120 or equivalent.) (Restriction: Not open to Honours or Majors in chemistry) (Restriction: Not open to students who have taken or plan to take CHEM 281) Systematic survey of the chemistry of the main group elements and their compounds. Basic concepts of electronic structure, bonding and structure will be developed and applied to the understanding of common materials. Emphasis on elements such as oxygen, nitrogen, silicon and others in order to understand their role in our everyday lives.

CHEM 203 Survey of Physical Chemistry.
(3) (Fall and Summer) (3 lectures) (Prerequisites: CHEM 110 and CHEM 120 or equivalent.) (Restriction: Intended for students in biological science programs requiring only one course in physical chemistry) (Restriction: Not open to students who have taken or are taking CHEM 204 or CHEM 213) A survey of the principles and methods of physical chemistry with emphasis on the use of biological examples. Topics will include thermodynamics, transport properties, kinetics, molecular structure and interactions, and spectroscopy.

CHEM 212 Introductory Organic Chemistry 1.
(4) (Fall and Winter and Summer) (3 lectures and a laboratory) (Prerequisite: CHEM 110 or equivalent.) (Corequisite: CHEM 120 or equivalent.) (Restriction: Not open to students who are taking or have taken CHEM 211) (Each lab section is limited enrolment) (Note: Some CEGEP programs provide equivalency for this course. For more information, please see the Department of Chemistry's Webpage (http://www.chemistry.mcgill.ca/advising/outside/equivalencies.htm). A survey of reactions of aliphatic and aromatic compounds including modern concepts of bonding, mechanisms, conformational analysis, and stereochemistry.

BIOL 200 Molecular Biology.
(3) (Fall) (3 hours lecture, 1 hour optional tutorial) (Prerequisite: BIOL 112 or equivalent.) (Corequisite: CHEM 212 or equivalent) The physical and chemical properties of the cell and its components in relation to their structure and function. Topics include: protein structure, enzymes and enzyme kinetics; nucleic acid replication, transcription and translation; the genetic code, mutation, recombination, and regulation of gene expression.

BIOL 215 Introduction to Ecology and Evolution.
(3) (Fall) (3 hours lecture) (Prerequisite: BIOL 111) (Restrictions: Not open to students who have taken BIOL 208, BIOL 304 or BIOL 305. Not open to students who have taken ENVR 200 and/or ENVR 202.) An introduction to the fundamental processes of ecology and evolution that bear on the nature and diversity of organisms and the processes that govern their assembly into ecological communities and their roles in ecosystem function.

EPSC 203 Structural Geology 1.
(3) (Winter) (2 hours lectures, 3 hours laboratory) Primary igneous and sedimentary structures, attitudes of planes and lines, stress and strain, fracturing of rocks, faulting, homogeneous strain, description and classification of folds, foliation and lineation, orthographic and stereographic projections.

EPSC 210 Introductory Mineralogy.
(3) (Fall) (2 hours lectures, 3 hours laboratory) Crystal chemistry and identification of the principal rock-forming and ore minerals. Elementary crystallography. Optional 2-day field trip.

ESYS 200 Earth System Processes.
(3) (Winter) (3 hours lecture) Complex interactions among the atmosphere, biosphere, geosphere and hydrosphere. Biological, chemical and physical processes within and between each "sphere" that extend over spatial scales ranging from microns to the size of planetary orbits and that span time scales from fractions of a second to billions of years.

ATOC 215 Oceans, Weather and Climate.
(3) (Winter) (3 hours lectures) (Prerequisite: CEGEP Physics or permission of the instructor) Laws of motion, geostrophic wind, gradient wind. General circulation of the atmosphere and oceans, local circulation features. Air-sea interaction, including hurricanes and sea-ice formation, extra-tropical weather systems and fronts, role of the atmosphere and oceans in climate.