2007 / 2008 CURRICULUM - SOFTWARE ENGINEERING

ENTRY FROM CEGEP **Total credits: 112**

First (Fall) Semester — 15 credits

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 s1	Basic Science Complementary 1	(3 cr)
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 — 17 credits

COMP 206	**Introduction to Software Systems**	(3 cr, P - COMP 202 or COMP 250)
COMP 302	**Prog. Languages & Paradigms**	(3 cr, P - COMP 250)
ECSE 210	**Circuit Analysis**	(3 cr, P - ECSE 200)
ECSE 291	**Electrical Measurements Lab**	(2 cr, C - ECSE 210)
ECSE 321	**Intro. to Software Engineering**	(3 cr, P - COMP 202 or COMP 208)
ECSE 322	**Computer Engineering**	(3 cr, P - ECSE 221 & ECSE 200 or MECH 383)

Fourth (Winter) Semester — 15 credits

COMP 361	**Systems Programming Project**	(3 cr, P - COMP 206. ECSE 321 or COMP 335 or COMP 303)
ECSE 306	**Fundamentals of Signals & Systems**	(3 cr, P - ECSE 210 & MATH 270 or MATH 271)
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 — 15 credits

COMP 251	**Data Struct. & Algorithms**	(3 cr, P - COMP 203 or COMP 250)
ECSE 305	**Probability & Random Signals 1**	(3 cr, P - ECSE 303 or ECSE 306)
ECSE 429	**Software Validation**	(3 cr, P - ECSE 321)
MIME 310	**Engineering Economy**	(3 cr)
XXXX xxx t1	Technical Complementary 1	(3 cr)

Sixth (Winter) Semester — 15 credits

COMP 360	**Algorithm Design Techniques**	(3 cr, P - COMP 251, MATH 240 or MATH 363)
ECSE 427	**Operating Systems**	(3 cr, P - ECSE 322 or COMP 273)
ECSE 428	**Software Engineering Practice**	(3 cr, P - ECSE 321 or COMP 335)
XXXX xxx t2	Technical Complementary 2	(3 cr)
XXXX xxx g2	General Complementary 2	(3 cr)

Seventh (Fall) Semester — 18 credits

COMP 420	**Files & Databases**	(3 cr, P - COMP 302)
ECSE 420	**Parallel Computing**	(3 cr, P - ECSE 427)
ECSE 495	**Software Engineering Project**	(3 cr, P - ECSE 321 & 42 departmental credits)
XXXX xxx s2	Basic Science Complementary 2	(3 cr)
XXXX xxx t3	Technical Complementary 3	(3 cr)
XXXX xxx t4	Technical Complementary 4	(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.

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

Basic Science complementary courses 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.

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TECHNICAL COMPLEMENTARY COURSES - SOFTWARE ENGINEERING PROGRAM

Technical Complementaries (4 courses) 12-14 credits

Students following the Software Engineering program should take 12-14 credits, of which 6 credits must be from list A, and 6-8 credits 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.

Software Engineering Technical Complementaries - GROUP A:

ECSE 529	Image Processing & Communication	(3 cr, P - ECSE 304 or ECSE 306)	
COMP 350	Numerical Computing	(3 cr, P - MATH 222, MATH 223 & one of COMP 202, COMP 208 or COMP 250 or equiv)	
COMP 409	Concurrent Programming	(3 cr, P - COMP 251, COMP 302 & COMP 310 or ECSE 427)	
COMP 424	Topics: Atrificial Intelligence 1	(3 cr, P - COMP 206, COMP 251 & COMP 302)	**OR**
ECSE 526	Artificial Intelligence	(3 cr, P - ECSE 322)	
COMP 520	Compiler Design	(3 cr, P - COMP 273 & COMP 302)	
COMP 566	Discrete Optimization 1	(3 cr, P - COMP 360 & MATH 223)	
COMP 575	Fundamentals of Distributed Algorithms	(3 cr, P - COMP 310)	

Software Engineering Technical Complementaries - GROUP B:

ECSE 323	Digital Systems Design	(5 cr, P - EDEC 206, ECSE 221 & ECSE 291)	
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 413	Communications Systems 2	(3 cr, P - ECSE 411)	
ECSE 414	Intro. to Telecom Networks	(3 cr, P - ECSE 304 or ECSE 306 & ECSE 322)	**OR**
COMP 535	Computer Networks 1	(3 cr, P - COMP 310)	
ECSE 421	Embedded Systems	(3 cr, P - ECSE 322 & ECSE 323)	
ECSE 422	Fault Tolerant Computing	(3 cr, P - ECSE 322)	
ECSE 424	Human-Computer Interaction	(3 cr, P - ECSE 322)	
ECSE 425	Computer Org. & Architecture	(3 cr, P - ECSE 322 & ECSE 323)	
ECSE 426	Microprocessor Systems	(3 cr, P - ECSE 323 & EDEC 206)	**OR**
COMP 573	Microcomputers	(3 cr, P - COMP 273)	
ECSE 504	Sampled Data Control	(3 cr, P - ECSE 304 or ECSE 306; C - ECSE 404)	
ECSE 530	Logic Synthesis	(3 cr, P - ECSE 323)	
ECSE 532	Computer Graphics	(3 cr, P - ECSE 322)	**OR**
COMP 557	Computer Graphics	(3 cr, P - MATH 223, COMP 206 & COMP 251)	

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BASIC SCIENCE COMPLEMENTARY COURSES - SOFTWARE ENGINEERING PROGRAM

Students following the Software Engineering Program (CEGEP entry) must take 6 credits (2 courses) from the following list:

PHYS 225 Musical Acoustics.
(3) (Winter) (3 hours lectures) (Prerequisites: CEGEP physics or both MATH 112 and PHYS 224) (Designed for students in music who have interests in sound recording and reproduction and also suitable for students in science with an interest in music) Physical acoustics with applications to music. Resonators and radiators, acoustic impedance. Acoustic properties of strings, bars, membranes, pipes and horns. Application to selected musical instruments. Direction characteristics of sound sources. Room acoustics.

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 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) (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.

EPSC 243 Environmental Geology
(3) (Fall and Winter and Summer) (3 hour lectures) Introduction to the relationship of geological processes and materials to the human environment; geologic hazards; hydrogeology; impacts of waste disposal, energy use, land resource development.

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.