MEMORANDUM

To: Academic Affairs Committee  
FROM: Robert L Baker  
DATE: 20 November 2002  
RE: Division of Science Curriculum Changes for 2003-2004

MESSAGE:

The changes listed below have been approved by the Curriculum Committee of the Division of Sciences and are presented for approval. Changes are presented as a summary. Approved changes to FSC and CCT will be presented in another document. ERS, ENV and PHY courses and programs have no changes.

ASTRONOMY

Dropped course

JEA 237H The Solar System

BIOLOGY

New Program

Biotechnology (Science)

Program Advisors:
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Biotechnology has been practised by human society since the beginning of recorded history in such activities as baking bread, brewing alcoholic beverages, or breeding food crops or domestic animals. In modern society, biotechnology is the application of scientific knowledge associated with molecular biology, genomes and proteins for the enhancement or protection of organisms. The Biotechnology industry hopes to enhance the future potential of biotechnology with respect to drugs, agriculture, forest, and environmental products.
This specialist program in biotechnology offers students a firm grounding in the science of biotechnology and a thorough understanding of the industry, and its social and ethical implications in a global framework. Faculty are drawn from the Biology Group and Chemistry with cooperation from the Faculty of Management.

Specialist Program ERSPEXXXX

**Limited Enrolment** - Enrolment in this program is limited. Students wishing to enrol at the end of the first year (4.0 credits) must obtain a cumulative grade point average of at least 2.50 to qualify.

Within an Honours degree, 15.0 credits are required, including at least 6.0 at the 300/400 level, of which 2.0 must be at the 400 level.

First Year:  BIO152H, BIO153H; CHM140Y; MAT 132Y; PHY135Y
Second Year:  BIO204H, BIO206H, BIO207H, BIO215H; CHM211H, CHM242H, CHM243H; IDR201H
Third and Fourth Years:
1) BIO360H, BIO370Y; JBC372H; CHM311H, CHM361H; MGM101H, MGM102H; BIO475H; JBC472H
2) 1.0 credit from:  BIO304H, BIO310H, BIO312H, BIO315H, BIO341H, BIO380H (note: BIO315 is co-prerequisite for this course); CHM333H (note: BIO231H is prerequisite for this course), CHM341H, CMH345H, CHM347H, CHM362H, CHM371H
3) 1.0 credit from CHM/BIO courses at the 400 level.

It is recommended that students in this program consider taking a research project course in either Biology (BIO481Y) or Chemistry (CHM489Y). Other 4th year courses directly relevant to this program are BIO478H - Functional Genomics and Bioinformatics (NEW COURSE), CHM414H - Advanced Topics in Analytical Chemistry, and CHM462H - Advances in Biological Chemistry.

New courses

BIO 478 H Functional Genomics and Bioinformatics 13L 26S
Functional Genomics utilizes a variety of modern technologies to understand the molecular, biochemical, cellular and/or physiological function of every gene in an organism's genome. Functional Genomics includes fields of study such as bioinformatics, transcriptomics, and proteomics. Lectures and seminars involve presentation and discussion of recently published research articles.

JBC472H5 (Y) Seminars in Biotechnology 39S
A seminar course designed to introduce the students to current topics in biotechnology. Seminars will be presented by speakers from both the university and industrial community. Topics will range from scientific (latest technologies and research) to business-oriented issues (ie. market strategies, government regulations, etc.). Students will work in teams to prepare seminars and lead discussions on current topics.

Dropped course

BIO 477H Molecular Biology of Gene Express and Cancer

Minor changes to course descriptions

CHEMISTRY

New Courses

CHM 242 H Introductory Organic Chemistry I 39L
Fundamentals of organic chemistry emphasizing reactions of alkanes and alkenes. The first half of a two-course sequence (with CHM243H) required in the chemistry major and specialist programs.

CHM 243H Introductory Organic Chemistry II 26L 52P
Fundamentals of organic chemistry extending to reactions of aromatic and carbonyl compounds. Continues from CHM242H

CHM422H NMR Spectroscopy 26L
Fundamentals of NMR spectroscopy including classical and quantum descriptions, NMR parameters and relaxation times, product operators, multi-dimensional NMR, solid-state techniques.

CHM 442H Developments in Organic Chemistry 26L
Applications of advanced fundamentals to, and recent developments in, multi-step organic synthesis

CHM 462H Advances in Biological Chemistry
Survey of recent developments in biological chemistry and applications of chemistry to study processes of biological significance

Dropped Courses

CHM 241 F Introductory Organic Chemistry
CHM 261 S Introductory Biochemistry

COMPUTER SCIENCE

New Courses

CSC236H: “Introduction to the Theory of Computation”
The application of logic and proof techniques to Computer Science. Mathematical induction; correctness proofs for iterative and recursive algorithms; recurrence equations and their solutions (including the “Master Theorem”); introduction to automata and formal languages.
Exclusion: CSC238H, 240H(G) Prerequisite: CSC148H; MAT102H

CSC207H: “Software Design”
An introduction to software design and development concepts, methods, and tools. Core topics: object-oriented design and programming; the role of scripting in the software development process; unit testing; version control; build management. Prerequisite: CSC148H; MAT102H

CSC263H: “Data Structures and Analysis”
Algorithm analysis: worst-case, average-case, and amortized complexity. Standard abstract data types, such as graphs, dictionaries, priority queues, and disjoint sets. A variety of data structures for implementing these abstract data types, such as balanced search trees, hashing, heaps, and disjoint forests. Design, implementation, and comparison of data structures.
Exclusion: CSC265H(G), 378H Prerequisite: CSC207H/270H, 236H/238H; STA257H

Exclusion: CSC364H, 365H(G) Prerequisite: CSC236H/238H

Standard algorithm design techniques: divide-and-conquer, greedy strategies, dynamic programming, linear programming, randomization, and others (such as local search). Students will be expected to show good design principles and adequate skills at reasoning about the correctness and complexity of algorithms. Exclusion: CSC364H, 375H(G) Prerequisite: CSC263H/378H

Principles of operating systems. The operating system as a control program and as a resource allocator. The concept of a process and concurrency problems: synchronization, mutual exclusion, deadlock. Additional topics include memory management, file systems, process scheduling, threads, and protection. Exclusion: CSC468H
Prerequisite: CSC258H, 209H, 207H/270H

Dropped Courses

CSC228H “File Structures and Data Management”
CSC238H “Discrete Mathematics for Computer Science”
CSC260 “Introduction to Scientific, Symbolic, and Graphical Computation”
CSC270H “Fundamental Data Structures and Techniques”
CSC364H “Computational Complexity and Computability” drop in 2004-2005
CSC378H “Data Structures and Algorithm Analysis” drop in 2004-2005
CSC428 “Human-Computer Interaction”
CSC468F “Operating Systems” drop in 2004-2005

Overview of structural changes to the UTM CSC programs for 2003-2004

Specialist in Computer Science: Comprehensive Option: Essentially the same except CSC343H is required.

Specialist in Computer Science: Information Systems Option: Essentially the same except CSC369H and CSC443H are required.

Specialist in Computer Science: Software Engineering Option: Essentially the same, except: CSC343H and CSC369H are now required and a “3 of” choice in 4th year is now a “2 of” choice.

Major in Computer Science: Essentially the same, except students must take a half-course in Linear Algebra and a half-course in Statistics rather than the option of a full year of Linear Algebra. An extra CSC half-course is required in 2nd year and 4, instead of 6, half-courses are now required in the upper years.

MATHEMATICS

MAT 133 52L changed to 78L

Minor changes to prerequisites and descriptions of MAT 102, MAT 132, MAT 133, MAT 138, MAT 309.
PSYCHOLOGY

PROGRAM CHANGES:

The following courses will fulfill 3rd year requirements for Psychology Major, Minor and Specialist Programs:

CCT316H Human Communication in Advertising (Social/Cognition)
CCT326H Communication Across the Lifespan (Cognition/Developmental)
CCT371H Music Perception and Cognition (Cognition)
CCT379H Speech Perception and Production (Cognition)

The following courses will fulfill requirements for the Exceptionality Specialist Program (program is interdisciplinary and is updated annually as other departments make changes to their curricula):


New courses

PSY397H Neuroplasticity and Behaviour
An examination of experimental findings and theory documenting the plasticity of the brain and its relationship to behaviour. The course will emphasize gene regulation, neurogenesis and cell morphology changes in relation to learning and experience.
[39L]
Prerequisite: PSY201H (or equivalent), 252H/290H/295H

SCIENCE EDUCATION

Program changes

Minor changes to list of options

STATISTICS

New Course

STA248H5 Statistics with Probability 39L 13T
A survey of statistical methodology with emphasis on data analysis and applications. Topics covered include descriptive statistics, data collection, design of experiments, tests of significance, confidence intervals, power, multiple regression, analysis of variance, and count data. A statistical computer package will be used.
Prerequisite: STA257H
Exclusion: STA220H, STA221H

Minor changes in course description