

BIOMEDICAL COMPUTING – SPECIALIZATION (COMPUTING) – BACHELOR OF COMPUTING (HONOURS)

BMCO-P-BCH (Biomedical Computing)
 BMCO-I-BCH (Biomedical Computing with Professional Internship)

Subject: Administered by the School of Computing in cooperation with the Departments of Biology, Chemistry, and Biomedical and Molecular Sciences.

Plan: Consists of 105.0 units as described below.

Program: The Plan, with sufficient electives to total 120.0 units, will lead to a Bachelor of Computing (Honours) Degree.

Code	Title	Units
1. Core		
A. Complete the following:		
CISC 121	Introduction to Computing Science I	3.00
CISC 124	Introduction to Computing Science II	3.00
B. Complete the following:		
BIOL 102	Fundamentals of Biology: Molecular and Cell Biology	3.00
BIOL 103	Fundamentals of Biology: Organisms to Ecosystems	3.00
C. Complete the following:		
CHEM 112	General Chemistry	6.00
D. Select 6.00 units from the following:		
CISC 102	Discrete Mathematics for Computing I & MATH 112 and Introduction to Linear Algebra	
CISC 102	Discrete Mathematics for Computing I & MATH 111 and Linear Algebra	
MATH 110	Linear Algebra	
E. Select 6.00 units from the following:		
MATH 120	Differential and Integral Calculus	
MATH 121	Differential and Integral Calculus	
MATH 123	Differential and Integral Calculus I	
MATH 124	Differential and Integral Calculus II	
F. Select 3.00 units from the following:		
STAT 263	Introduction to Statistics	3.00
STAT_Options		
G. Complete the following:		
CISC 203	Discrete Mathematics for Computing II	3.00
CISC 204	Logic for Computing Science	3.00
CISC 221	Computer Architecture	3.00
CISC 223	Software Specifications	3.00

CISC 235	Data Structures	3.00
CISC 271	Linear Data Analysis	3.00
H. Complete the following:		
BIOL 205	Mendelian and Molecular Genetics	3.00
I. Complete the following:		
BCHM 218	Molecular Biology	3.00
J. Complete the following:		
CISC 320	Fundamentals of Software Development	3.00
CISC 330	Computer-Integrated Surgery	3.00
CISC 332	Database Management Systems	3.00
CISC 352	Artificial Intelligence	3.00
CISC 365	Algorithms I	3.00
CISC 360	Programming Paradigms	3.00
K. Select 3.00 units from the following:		
BIOL 334	Comparative Biochemistry	3.00
BCHM 315	Proteins and Enzymes	3.00
L. Complete the following:		
BIOL 331	Analytical Genomics	3.00
M. Complete the following:		
CISC 471	Computational Biology	3.00
CISC 472	Medical Informatics	3.00
N. Complete the following:		
CISC 497	Social, Ethical and Legal Issues in Computing	3.00
O. Select 3.00 units from the following:		
CISC 499	Advanced Undergraduate Project	
CISC 500	Undergraduate Thesis	

2. Option

A. BMCO_Options 12.00

Electives

Elective Courses 15.00

Total Units 120.00

3. Substitutions

A. Students in the internship version of this Plan will substitute 3.0 units from COMP at the 300 level for requirement 1.O. (CISC 499 Advanced Undergraduate Project). In addition, the B.Cmp.(Hons.) Program requirements will be increased by 6.0 units from COMP at the 300 level, for a total of 126.0 units if the student is taking a 12-month internship,



or by 9.0 units from COMP at the 300 level, for a total of 129.0 units if the student is taking a 16-month internship.

4. Notes

A. Those students with no programming experience should review first-year course choices based on the Section on Introductory Courses at the start of the chapter on Computing.

B. ELEC courses are offered by the Faculty of Engineering and Applied Science. Special permission may be required to register. All such courses will count as 3.0 units towards degree requirements in Arts and Sciences.

C. A maximum of 6.0 units from courses offered by other Faculties and Schools may be counted toward the program and/or Plan Requirements. This includes courses in BMED, COMM, GLPH, LAW, NURS and courses in the Faculty of Engineering and Applied Science.

Biomedical Computing Course List

The following list contains courses offered through other Departments. In accordance with Academic Regulation 2.5 (Access to Classes), students do not have enrolment priority in all of these courses. Access to these courses may only be made available during the Open Enrolment period, and then only if space permits.

BMCO_Options

Code	Title	Units
Options in the Biomedical Computing Plan		
CHEM 281	General Organic Chemistry I (with Virtual Laboratory)	3.00
CHEM 282	General Organic Chemistry II	3.00
CHEM 285	General Organic Chemistry II (with Virtual Laboratory)	3.00
PHGY 215	Principles of Mammalian Physiology I	3.00
PHGY 216	Principles of Mammalian Physiology II	3.00

(ANAT; BIOL; BCHM; CANC; CISC; CISC_Subs; CRSS; DDHT; EPID; LISC; MBIO; MICR; PATH; PHAR; PHGY) at the 300 level or above

CISC_Subs

Code	Title	Units
Courses in other departments usable as CISC options		
COMM 365		
ELEC 470	Computer System Architecture	3.50
MATH 272	Applications of Numerical Methods	3.00
MATH 337	Stochastic Models in Operations Research	3.00
MATH 401	Graph Theory	3.00

MATH 402	Enumerative Combinatorics	3.00
MATH 434	Optimization Theory with Applications to Machine Learning	3.00
MATH 474	Information Theory	3.00

STAT_Options

Code	Title	Units
Statistic Course Options		
BIOL 243	Introduction to Statistics	3.00
CHEE 209	Analysis Of Process Data	3.50
COMM 162	Managerial Statistics	3.00
ECON 250	Introduction to Statistics	3.00
GPHY 247	Introduction to Statistics	3.00
KNPE 251	Introduction to Statistics	3.00
NURS 323	Introduction to Statistics	3.00
POLS 385	Introduction to Statistics	3.00
PSYC 202	Statistics in Psychology	3.00
SOCY 211	Introduction to Statistics	3.00
STAM 200	Introduction to Statistics	3.00
STAT 252	Introductory Applied Probability	3.00
STAT 263	Introduction to Statistics	3.00
STAT 367	Engineering Data Analysis	4.00