Lakehead University
Faculty of Science and Environmental Studies

REQUEST REPORT

Request Tracking Number: 2013-SCI-2718
Request Title: HBScCompSciCoop Update

Request Effective Date: F-W 2014-15
Request Status: In Workflow
Request can't be split

Request Contents

Type		Title
1.	New Version of a Degree	Honours BSc (Computer Science) Co-operative Program

Request History

Workflow Step	Workflow Action	User	Change Made	Comments	Date
Initiator	Approved	Maurice Benson	Yes	Submitted to workflow	10/25/2013
Dean and Faculty Council Review Stage	Approved	Christina Maenpaa	No	The proposed change was approved by the SES Faculty Council on October 15, 2013. Dr. Dean approves the changes.	10/25/2013
Optional Dean-Social Sciences and Humanities	Approved	Gillian Siddall	No	Approved.	11/16/2013

Supporting Documents

File Name	Uploaded By	Upload Date	Size
SocialScienceSignatureofApproval.pdf	Maurice Benson	10/25/2013	2.36 MB

Supporting Documents Audit Trail

File Name	User	Date	Action

SocialScienceSignatureofAppr oval.pdf	Maurice Benson	10/25/2013	Uploaded

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Notes

Date	User	Note
10/25/2013	Maurice Benson	Update our first year arts requirements due to Philosophy changes

1.	New Version of a Degree	HBSC.COMP.CP - Honours BSc (Computer Science) Co-operative Program

Justification

The Philosophy Department changed its old PHIL1100 into two half courses. We listed the old PHIL1100 as one of our first year arts electives. Our new first arts elective list includes all first year philosophy courses (all of which have a writing component, our main criteria). The new arrangement is more flexible in that a mixing is now possible between the English and Philosophy half courses on the list.

Degree Details

CURRENT VERSION	PROPOSED VERSION
HBSC.COMP.CP - Honours BSc (Computer Science) Co-operative Program **Start Term:** Fall 2013 **End Term:** No Specified End Date	HBSC.COMP.CP - Honours BSc (Computer Science) Co-operative Program **Start Term:** ~~Fall 2013~~ *F-W 2014-15* **End Term:** No Specified End Date

Required Information

CURRENT VERSION	PROPOSED VERSION
Institution Unit Faculty of Science and Environmental Studies	**Institution Unit** Faculty of Science and Environmental Studies
Degree Type HBSC	**Degree Type** HBSC
Major COMP	**Major** COMP
Minor	**Minor**
Specialization	**Specialization**
Rationale #2012-SCI-417 Split PHYS 1101. Associated program changes for Department of Computer Science not included in original proposal. Authorized to change by 19June2013 e-mail from M. Benson and verbal approval from Registrar.	**Rationale** #2012-SCI-417 Split PHYS 1101. Associated program changes for Department of Computer Science not ~~included in original proposal. Authorized to change by 19June2013 e-mail from M. Benson and verbal approval from Registrar.~~ *inc*
Requirements There are three options in this program, Business, Scientific and Hardware. Students must choose one at the time of initial registration. For help in making this choice, contact the Chair of the Department. **Note:** Students in this program are required to take at least 5 FCEs outside the Departments of Computer Science and Mathematical Sciences. (a) Business Option	**Requirements** There are three options in this program, Business, Scientific and Hardware. Students must choose one at the time of initial registration. For help in making this choice, contact the Chair of the Department. **Note:** Students in this program are required to take at least 5 FCEs outside the Departments of Computer Science and Mathematical Sciences. (a) Business Option

Year-to-year continuation in the program requires an average of at least 70% in all Computer Science courses, and satisfactory completion of the work period assignments.

First Year (Fall and Winter):
(a) Mathematics 1171, 1172, 1271 and 1272; Computer Science 1411, 1431
(b) One FCE elective in Humanities or Social Sciences chosen from: History 1100, Philosophy 1100, or any combination of English 1011, 1031, 1111, 1112
(c) Business 1511, 1512

First Year (Spring/Summer):
At the discretion of the Chair of the Department, some students may have the opportunity of a formal work period assignment (Computer Science 1990).

Second Year (Fall and Winter):
(a) Mathematics 2255, 2275
(b) Computer Science 2412, 2453, 2476 and 2477
(c) Business 2012 and 2033
(d) Sociology 2455
(e) One half-course elective

Note:
Students interested in the Physics selections from the list of electives should take Mathematics 2131 and Physics 2211.

Second Year (Spring/Summer):
Optional formal work period assignment (Computer Science 2990)

Third Year (Fall):
(a) Computer Science 3413, 3415, 3473
(b) Business 3213
(c) Mathematics 3332

Third Year (Winter):
Formal work period assignment (Computer Science 3990)

Third Year (Spring/Summer):
Formal work period assignment (Computer Science 3992)

Departmental approval must be obtained at the time of registration (co-operative) by all students at or beyond the third year level.

Fourth Year (Fall and Winter):
(a) Computer Science 4411, 4433 and 4453
(b) Business 4253 or 4273

Year-to-year continuation in the program requires an average of at least 70% in all Computer Science courses, and satisfactory completion of the work period assignments.

First Year (Fall and Winter):
(a) Mathematics 1171, 1172, 1271 and 1272; Computer Science 1411, 1431
(b) One FCE elective in Humanities or Social Sciences chosen from: History 1100, Philosophy 1100, or any combination of *1110, 1111, 1117, 1118, 1119, 1571, 1573,* English 1011, 1031, 1111, 1112
(c) Business 1511, 1512

First Year (Spring/Summer):
At the discretion of the Chair of the Department, some students may have the opportunity of a formal work period assignment (Computer Science 1990).

Second Year (Fall and Winter):
(a) Mathematics 2255, 2275
(b) Computer Science 2412, 2453, 2476 and 2477
(c) Business 2012 and 2033
(d) Sociology 2455
(e) One half-course elective

Note:
Students interested in the Physics selections from the list of electives should take Mathematics 2131 and Physics 2211.

Second Year (Spring/Summer):
Optional formal work period assignment (Computer Science 2990)

Third Year (Fall):
(a) Computer Science 3413, 3415, 3473
(b) Business 3213
(c) Mathematics 3332

Third Year (Winter):
Formal work period assignment (Computer Science 3990)

Third Year (Spring/Summer):
Formal work period assignment (Computer Science 3992)

Departmental approval must be obtained at the time of registration (co-operative) by all students at or beyond the third year level.

(c) Mathematics 3334
(d) One FCE from List of Program Electives below
(e) Three half-course electives

Fourth Year (Spring/Summer):
Formal work period assignment (Computer Science 4990)

Departmental approval must be obtained at the time of registration (co-operative) by all students at or beyond the third year level.

Fifth Year (Fall):
Formal work period assignment (Computer Science 4992)

Fifth Year (Winter):
(a) Computer Science 4413 and either Computer Science 4431 or 4432
(b) One half-course elective from List of Mathematics Electives for Computer Science
(c) One half-course elective from List of Program Electives below
(d) One half-course elective

(b) Science Option

Year-to-year continuation in the program requires an average of at least 70% in all Computer Science courses, and satisfactory completion of the work period assignments.

First Year (Fall and Winter):
(a) Mathematics 1171, 1172, 1271 and 1272; Computer Science 1411, 1431
(b) One FCE elective in Humanities or Social Sciences chosen from: History 1100, Philosophy 1100, or any combination of English 1011, 1031, 1111, 1112
(c) Physics 1211 and Physics 1212, or one FCE electives (not from Computer Science or Mathematics) approved by the Department

First Year (Spring/Summer):
At the discretion of the Chair of the Department, some students may have the opportunity of a formal work period assignment (Computer Science 1990).

Second Year (Fall and Winter):
(a) Mathematics 2111, 2255 and 2275
(b) Computer Science 2412, 2453, 2476 and 2477
(c) Sociology 2455
(d) One FCE electives

Note:
Students interested in the Physics selections from the list of electives should take Mathematics 2131 and Physics 2211.

Fourth Year (Fall and Winter):
(a) Computer Science 4411, 4433 and 4453
(b) Business 4253 or 4273
(c) Mathematics 3334
(d) One FCE from List of Program Electives below
(e) Three half-course electives

Fourth Year (Spring/Summer):
Formal work period assignment (Computer Science 4990)

Departmental approval must be obtained at the time of registration (co-operative) by all students at or beyond the third year level.

Fifth Year (Fall):
Formal work period assignment (Computer Science 4992)

Fifth Year (Winter):
(a) Computer Science 4413 and either Computer Science 4431 or 4432
(b) One half-course elective from List of Mathematics Electives for Computer Science
(c) One half-course elective from List of Program Electives below
(d) One half-course elective

(b) Science Option

Year-to-year continuation in the program requires an average of at least 70% in all Computer Science courses, and satisfactory completion of the work period assignments.

First Year (Fall and Winter):
(a) Mathematics 1171, 1172, 1271 and 1272; Computer Science 1411, 1431
(b) One FCE elective in Humanities or Social Sciences chosen from: History 1100, Philosophy ~~1100, or any combination of~~ *1110, 1111, 1117, 1118, 1119, 1571, 1573,* English 1011, 1031, 1111, 1112
(c) Physics 1211 and Physics 1212, or one FCE electives (not from Computer Science or Mathematics) approved by the Department

First Year (Spring/Summer):
At the discretion of the Chair of the Department, some students may have the opportunity of a formal work period assignment (Computer Science 1990).

Second Year (Fall and Winter):
(a) Mathematics 2111, 2255 and 2275
(b) Computer Science 2412, 2453, 2476 and 2477
(c) Sociology 2455

Science option students interested in expanding their business background may take Business 1511, 1512, or another Business course with permission of the Faculty of Business Administration.

Second Year (Spring/Summer):
Optional formal work period assignment (Computer Science 2990)

Third Year (Fall):
(a) Computer Science 3413, 3415, 3473
(b) Mathematics 3332
(c) One half-course elective

Third Year (Winter):
Formal work period assignment (Computer Science 3990)

Third Year (Spring/Summer):
Formal work period assignment (Computer Science 3992)

Departmental approval must be obtained at the time of registration (co-operative) by all students at or beyond the third year level.

Fourth Year (Fall and Winter):
(a) Computer Science 4411, 4433 and 4453
(b) Mathematics 3334
(c) One half-course elective from List of Mathematics Electives for Computer Science
(d) Three half-courses from List of Program Electives below
(e) One FCE electives

Fourth Year (Spring/Summer):
Formal work period assignment (Computer Science 4990)

Departmental approval must be obtained at the time of registration (co-operative) by all students at or beyond the third year level.

Fifth Year (Fall):
Formal work period assignment (Computer Science 4992)

Fifth Year (Winter):
(a) Computer Science 4413, 4451 and either Computer Science 4431 or 4432
(b) One half-course from List of Program Electives below
(c) One half-course elective

(c) Hardware Option

Year-to-year continuation in the program requires an average of at least 70% in all Computer Science courses, and satisfactory completion of the work

(d) One FCE electives

Note:
Students interested in the Physics selections from the list of electives should take Mathematics 2131 and Physics 2211.
Science option students interested in expanding their business background may take Business 1511, 1512, or another Business course with permission of the Faculty of Business Administration.

Second Year (Spring/Summer):
Optional formal work period assignment (Computer Science 2990)

Third Year (Fall):
(a) Computer Science 3413, 3415, 3473
(b) Mathematics 3332
(c) One half-course elective

Third Year (Winter):
Formal work period assignment (Computer Science 3990)

Third Year (Spring/Summer):
Formal work period assignment (Computer Science 3992)

Departmental approval must be obtained at the time of registration (co-operative) by all students at or beyond the third year level.

Fourth Year (Fall and Winter):
(a) Computer Science 4411, 4433 and 4453
(b) Mathematics 3334
(c) One half-course elective from List of Mathematics Electives for Computer Science
(d) Three half-courses from List of Program Electives below
(e) One FCE electives

Fourth Year (Spring/Summer):
Formal work period assignment (Computer Science 4990)

Departmental approval must be obtained at the time of registration (co-operative) by all students at or beyond the third year level.

Fifth Year (Fall):
Formal work period assignment (Computer Science 4992)

Fifth Year (Winter):
(a) Computer Science 4413, 4451 and either Computer Science 4431 or 4432

period assignments.

First Year (Fall and Winter):
(a) Mathematics 1171 and 1172; Computer Science 1411, 1431; Physics 1211, 1212
(b) Mathematics 1271, 1272 or Chemistry 1110, 1130
(c) One FCE elective in Humanities or Social Sciences chosen from: History 1100, Philosophy 1100, or any combination of English 1011, 1031, 1111, 1112

First Year (Spring/Summer):
At the discretion of the Chair of the Department, some students may have the opportunity of a formal work period assignment (Computer Science 1990).

Second Year (Fall and Winter):
(a) Mathematics 2111 and 2131
(b) Computer Science 2412, 2453, 2476 and 2477
(c) Physics 2211, 2311, 2331, 2332

Second Year (Spring/Summer):
Optional formal work period assignment (Computer Science 2990)

Third Year (Fall):
(a) Mathematics 2255
(b) Computer Science 3415, 3473
(c) Physics 3231
(d) Sociology 2455

Third Year (Winter):
Formal work period assignment (Computer Science 3990)

Third Year (Spring/Summer):
Formal work period assignment (Computer Science 3992)

Departmental approval must be obtained at the time of registration (co-operative) by all students at or beyond the third year level.

Fourth Year (Fall):
(a) Computer Science 4411 and a half-course Computer Science elective
(b) Physics 3211 and a half-course Physics elective
(c) One half-course elective

Fourth Year (Winter):
(a) Mathematics 2275
(b) Computer Science 4475 and a half-course Computer Science elective
(c) Physics 3611
(d) One half-course elective

(b) One half-course from List of Program Electives below
(c) One half-course elective

(c) Hardware Option

Year-to-year continuation in the program requires an average of at least 70% in all Computer Science courses, and satisfactory completion of the work period assignments.

First Year (Fall and Winter):
(a) Mathematics 1171 and 1172; Computer Science 1411, 1431; Physics 1211, 1212
(b) Mathematics 1271, 1272 or Chemistry 1110, 1130
(c) One FCE elective in Humanities or Social Sciences chosen from: History 1100, Philosophy 1100, or any combination of *1110, 1111, 1117, 1118, 1119, 1571, 1573,* English 1011, 1031, 1111, 1112

First Year (Spring/Summer):
At the discretion of the Chair of the Department, some students may have the opportunity of a formal work period assignment (Computer Science 1990).

Second Year (Fall and Winter):
(a) Mathematics 2111 and 2131
(b) Computer Science 2412, 2453, 2476 and 2477
(c) Physics 2211, 2311, 2331, 2332

Second Year (Spring/Summer):
Optional formal work period assignment (Computer Science 2990)

Third Year (Fall):
(a) Mathematics 2255
(b) Computer Science 3415, 3473
(c) Physics 3231
(d) Sociology 2455

Third Year (Winter):
Formal work period assignment (Computer Science 3990)

Third Year (Spring/Summer):
Formal work period assignment (Computer Science 3992)

Departmental approval must be obtained at the time of registration (co-operative) by all students at or beyond the third year level.

Fourth Year (Spring/Summer):
Formal work period assignment (Computer Science 4990)

Departmental approval must be obtained at the time of registration (co-operative) by all students at or beyond the third year level.

Fifth Year (Fall):
Formal work period assignment (Computer Science 4992)

Fifth Year (Winter):
(a) Computer Science 4453 and one half-course Computer Science elective
(b) Physics 3311
(c) Two half-course electives

BSc (Physics)
Students wishing to complete the requirements for a BSc in Physics following the HBSc (Computer Science) Hardware Option program must complete Chemistry 1110/1130 and Physics 2111 and 3113 and have a total of at least 6 FCEs in Physics.

List of Program Electives

Applied Mathematics:
Mathematics 3331 - Optimization
Mathematics 3333 - Operations Research
Mathematics 3373 - Combinatorics and Graph Theory

Computer Science:
Computer Science 4451 - Theory of Computing
Computer Science 4471 - Computer Graphics
Computer Science 4475 - Topics in Artificial Intelligence
Computer Science 4476 - Cryptography and Network Security
Computer Science 4478 - Games Design Patterns
Computer Science 4479 - Reading and Research in Computer Science

Numerical Analysis:
Mathematics 3351 - Applied Numerical Methods
Mathematics 3371 - Computational Linear Algebra and Numerical Approximation I

Physics:
Physics 2211 - Intermediate Electricity and Magnetism
Physics 3231 - Introductory Electronics
Physics 3611 - Computer Acquisition and Control

Engineering (with permission of the instructor):
Engineering 4559 - Signal Processing for Software Engineers

Fourth Year (Fall):
(a) Computer Science 4411 and a half-course Computer Science elective
(b) Physics 3211 and a half-course Physics elective
(c) One half-course elective

Fourth Year (Winter):
(a) Mathematics 2275
(b) Computer Science 4475 and a half-course Computer Science elective
(c) Physics 3611
(d) One half-course elective

Fourth Year (Spring/Summer):
Formal work period assignment (Computer Science 4990)

Departmental approval must be obtained at the time of registration (co-operative) by all students at or beyond the third year level.

Fifth Year (Fall):
Formal work period assignment (Computer Science 4992)

Fifth Year (Winter):
(a) Computer Science 4453 and one half-course Computer Science elective
(b) Physics 3311
(c) Two half-course electives

BSc (Physics)
Students wishing to complete the requirements for a BSc in Physics following the HBSc (Computer Science) Hardware Option program must complete Chemistry 1110/1130 and Physics 2111 and 3113 and have a total of at least 6 FCEs in Physics.

List of Program Electives

Applied Mathematics:
Mathematics 3331 - Optimization
Mathematics 3333 - Operations Research
Mathematics 3373 - Combinatorics and Graph Theory

Computer Science:
Computer Science 4451 - Theory of Computing
Computer Science 4471 - Computer Graphics
Computer Science 4475 - Topics in Artificial Intelligence
Computer Science 4476 - Cryptography and Network Security
Computer Science 4478 - Games Design Patterns
Computer Science 4479 - Reading and Research in Computer Science

List of Mathematics Electives for Computer Science

Mathematics 2111 - Differential Equations
Mathematics 2131 - Vector Calculus
Mathematics 3331 - Linear Programming and Applications
Mathematics 3333 - Operations Research
Mathematics 3351 - Applied Numerical Methods
Mathematics 3371 - Computational Linear Algebra and Numerical Approximation I
Mathematics 3373 - Combinatorics and Graph Theory

Apprenticeship and Internship Options

Apprenticeship
This option is available for the first year Computer Science Co-op students (as the optional Spring/Summer work term). Computer Science 1990 is offered throughout the year as an entry level work term for Computer Science students and qualified students who wish to gain on-the-job training in Computer Science.

Internship
This option offers an extended work term (normally 8 months) for senior level students (Fourth or Fifth Year). This is suitable for Computer Science students who wish to gain extensive and in-depth experience in applications of Computer Science. The work terms are made of two or more consecutive work terms Computer Science 3990, 3992 (or 4990), 4992 (Winter, Spring/Summer, Fall).

Applications must be made through the Office of Admissions and Recruitment as detailed in the Requirements for Admission to Undergraduate Degree Programs. The application will be carefully examined by the Department and Career and Co-operative Education Services. The acceptance of a student in these options depends highly on the demands from the employers as well as the student's academic qualifications and communication skills.

Numerical Analysis:
Mathematics 3351 - Applied Numerical Methods
Mathematics 3371 - Computational Linear Algebra and Numerical Approximation I

Physics:
Physics 2211 - Intermediate Electricity and Magnetism
Physics 3231 - Introductory Electronics
Physics 3611 - Computer Acquisition and Control

Engineering (with permission of the instructor):
Engineering 4559 - Signal Processing for Software Engineers

	a student in these options depends highly on the demands from the employers as well as the student's academic qualifications and communication skills.

Budgetary Considerations	
CURRENT VERSION	**PROPOSED VERSION**
Student Enrolment	**Student Enrolment** *No. It is just an update to reflect changes from Philosophy.*
Student Enrolment Other Units	**Student Enrolment Other Units** *No. It is just an update to reflect changes from Philosophy.*
Additional Resources	**Additional Resources** *No. It is just an update to reflect changes from Philosophy.*
Teaching Loads	**Teaching Loads** *No. It is just an update to reflect changes from Philosophy.*
TeachingSupport Services	**TeachingSupport Services** *No. It is just an update to reflect changes from Philosophy.*
Outside Support	**Outside Support** *No. It is just an update to reflect changes from Philosophy.*