



Program/Major or Minor/Concentration Revision Form

(07/2004)

<p>1.0 Degree Title Specify the two degrees for concurrent degree programs</p> <div style="border: 1px solid black; padding: 2px; margin-bottom: 5px;">Master of Science (M.Sc.)</div> <p>1.1 Major (Legacy= Subject) (30-char. max.)</p> <div style="border: 1px solid black; padding: 2px; margin-bottom: 5px;">Computer Science</div> <p>1.2 Concentration (Legacy = Concentration/Option) If applicable (30 char. max.)</p> <div style="border: 1px solid black; padding: 2px; margin-bottom: 5px;">Computational Science and Engineering</div> <p>1.3 Minor (with Concentration, if applicable) (30 char. max.)</p> <p>1.4 Category</p> <table style="width: 100%; border: none;"> <tr> <td style="width: 50%; border: none;">Faculty Program (FP)</td> <td style="width: 50%; border: none;">Honours (HON)</td> </tr> <tr> <td style="border: none;">Major</td> <td style="border: none;">Joint Honours</td> </tr> <tr> <td style="border: none;">Joint Major</td> <td style="border: none;">Component (HC)</td> </tr> <tr> <td style="border: none;">Major Concentration (CON)</td> <td style="border: none;">Internship/Co-op</td> </tr> <tr> <td style="border: none;">Minor</td> <td style="border: none;"><input checked="" type="checkbox"/> Thesis (T)</td> </tr> <tr> <td style="border: none;">Minor Concentration (CON)</td> <td style="border: none;">Non-Thesis (N)</td> </tr> <tr> <td style="border: none;"></td> <td style="border: none;">Other</td> </tr> <tr> <td style="border: none;"></td> <td style="border: none;">Please specify</td> </tr> </table> <div style="border: 1px solid black; width: 100%; height: 20px; margin-top: 5px;"></div> <p>1.5 Master of Science (M.Sc.); Computer Science (Thesis) — Computational Science and Engineering (45 credits)</p>	Faculty Program (FP)	Honours (HON)	Major	Joint Honours	Joint Major	Component (HC)	Major Concentration (CON)	Internship/Co-op	Minor	<input checked="" type="checkbox"/> Thesis (T)	Minor Concentration (CON)	Non-Thesis (N)		Other		Please specify	<p>2.0 Administering Faculty/Unit</p> <div style="border: 1px solid black; padding: 2px; margin-bottom: 5px;">Graduate and Postdoctoral Studies</div> <p>Offering Faculty/Department</p> <div style="border: 1px solid black; padding: 2px; margin-bottom: 5px;">Faculty of Science / Computer Science</div> <p>3.0 Effective Term of revision or retirement Please give reasons in 5.0 "Rationale" in the case of retirement (Ex. Sept. 2004 = 200409) Retirement</p> <p>Term: 201409</p> <p>4.0 Existing Credit Weight Proposed Credit Weight</p> <div style="display: flex; justify-content: space-around; margin-top: 5px;"> <div style="border: 1px solid black; padding: 2px; width: 40%;">46</div> <div style="border: 1px solid black; padding: 2px; width: 40%;">45</div> </div> <p>5.0 Rationale for revised program</p> <div style="border: 1px solid black; padding: 5px; margin-top: 5px;"> <p>In order that students conduct a broad research review instead of focussing simply on their specific M.Sc. topic, COMP 601, Thesis Literature Review, 2 credits is being re-instated into the M.Sc. program.</p> <p>The addition of COMP 601, required the adjustment of COMP 691, Thesis Research 1, from 2 credits to 3 credits to fulfill the requirements of 24 credits of thesis courses.</p> <p>This Program Revision Form takes account of the above changes, and as well the recently approved changes in credit weight of COMP 691, COMP 698 and COMP 699 (which were also performed to keep with the 24 credit requirement for thesis courses)</p> </div>
Faculty Program (FP)	Honours (HON)																
Major	Joint Honours																
Joint Major	Component (HC)																
Major Concentration (CON)	Internship/Co-op																
Minor	<input checked="" type="checkbox"/> Thesis (T)																
Minor Concentration (CON)	Non-Thesis (N)																
	Other																
	Please specify																
<p>6.0 Revised Program Description (Maximum 150 words)</p> <div style="border: 1px solid black; padding: 10px; min-height: 200px;"> <p>No change from what is currently written in the graduate calendar.</p> </div> <div style="display: flex; margin-top: 5px;"> <div style="width: 20px;"> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> </div> </div>																	

7.0 List of existing program and proposed program

Existing program (list courses as follows: Subj Code/Crse Num, Title, Credit weight, under the headings of: Required Courses, Complementary Courses, Elective Courses)

M.Sc. in Computer Science - Computational Science and Engineering Option

Program Requirements

Thesis Courses (24 credits)

24 credits selected from

- COMP 691 Thesis Research 1 (2 credits)
- COMP 696 Thesis Research 2 (3 credits)
- COMP 697 Thesis Research 3 (4 credits)
- COMP 698 Thesis Research 4 (9 credits)
- COMP 699 Thesis Research 5 (15 credits)

Required Courses

One credit selected as follow:

- COMP 669D1 Computational Science Engineering Seminar (0.5 credits)
- COMP 669D2 Computational Science Engineering Seminar (0.5 credits)

Complementary Courses

(minimum 24 credits)

Two courses from List A, two courses from List B, and the remaining credits to be chosen from graduate (500-, 600-, or 700-level) courses in the School of Computer Science. Two complementary courses must be taken outside the School of Computer Science.

Note: Students with an appropriate background can substitute 3 credits by COMP 696 and 4 credits by COMP 697, but still need to take 6-8 credits from List A and 6-8 credits from List B.

List A: Scientific Computing Courses:

- CIVE 602 Finite Element Analysis (4 credits)
- COMP 522 Modelling and Simulation (4 credits)
- COMP 540 Matrix Computations (3 credits)
- COMP 566 Discrete Optimization 1 (3 credits)
- MATH 578 Numerical Analysis 1 (4 credits)
- MATH 579 Numerical Differential Equations (4 credits)

Continued on next page

Proposed program (list courses as follows: Subj Code/Crse Num, Title, Credit weight, under the headings of: Required Courses, Complementary Courses, Elective Courses)

M.Sc. in Computer Science - Computational Science and Engineering Option

Program Requirements

Required Thesis Courses (24 credits)

COMP 601 Thesis Literature Review (2 credits)

The remaining 22 credits selected from:

- **COMP 691 Thesis Research 1 (3 credits)**
- COMP 696 Thesis Research 2 (3 credits)
- COMP 697 Thesis Research 3 (4 credits)
- COMP 698 Thesis Research 4 (10 credits)
- COMP 699 Thesis Research 5 (12 credits)

Required Courses (1 credit)

One credit selected as follow:

- COMP 669D1 Computational Science Engineering Seminar (0.5 credits)
- COMP 669D2 Computational Science Engineering Seminar (0.5 credits)

Complementary Courses

(minimum 20 credits)

At least 6 courses whereby at least two courses must be from List A, at least two courses must be from List B, and the remaining credits can be chosen from graduate (500-, 600-, or 700-level) courses in the School of Computer Science. Two complementary courses must be taken outside the School of Computer Science.

Note: Students with an appropriate background can substitute 3 credits by COMP 696 and 4 credits by COMP 697, but still need to take 6-8 credits from List A and 6-8 credits from List B.

List A: Scientific Computing Courses:

- CIVE 602 Finite Element Analysis (4 credits)
- COMP 522 Modelling and Simulation (4 credits)
- COMP 540 Matrix Computations (3 credits)
- COMP 566 Discrete Optimization 1 (3 credits)
- MATH 578 Numerical Analysis 1 (4 credits)
- MATH 579 Numerical Differential Equations (4 credits)

Continued on next page

See attached page

7.0 List of existing program and proposed program (Continued)

List B: Application and Specialized Methods Courses:	List B: Application and Specialized Methods Courses:
<ul style="list-style-type: none"> • ATOC 512 Atmospheric and Oceanic Dynamics (3 credits) • ATOC 513 Waves and Stability (3 credits) • ATOC 515 Turbulence in Atmosphere and Oceans (3 credits) • CIVE 572 Computational Hydraulics (3 credits) • CIVE 603 Structural Dynamics (4 credits) • COMP 557 Fundamentals of Computer Graphics (3 credits) • COMP 558 Fundamentals of Computer Vision (3 credits) • COMP 567 Discrete Optimization 2 (3 credits) • COMP 621 Program Analysis and Transformations (4 credits) • COMP 642 Numerical Estimation Methods (4 credits) • COMP 767 Advanced Topics: Applications 2 (4 credits) • ECSE 507 Optimization and Optimal Control (3 credits) • ECSE 532 Computer Graphics (3 credits) • ECSE 547 Finite Elements in Electrical Engineering (3 credits) • ECSE 549 Expert Systems in Electrical Design (3 credits) • MATH 555 Fluid Dynamics (4 credits) • MATH 560 Optimization (4 credits) • MATH 761 Advanced Topics in Applied Mathematics 1 (4 credits) • MECH 533 Subsonic Aerodynamics (3 credits) • MECH 537 High-Speed Aerodynamics (3 credits) • MECH 538 Unsteady Aerodynamics (3 credits) • MECH 539 Computational Aerodynamics (3 credits) • MECH 541 Kinematic Synthesis (3 credits) • MECH 572 Introduction to Robotics (3 credits) • MECH 573 Mechanics of Robotic Systems (3 credits) • MECH 576 Geometry in Mechanics (3 credits) • MECH 577 Optimum Design (3 credits) • MECH 610 Fundamentals of Fluid Dynamics (4 credits) • MECH 620 Advanced Computational Aerodynamics (4 credits) • MECH 632 Theory of Elasticity (4 credits) • MECH 642 Advanced Dynamics (4 credits) • MECH 650 Fundamentals of Heat Transfer (4 credits) • MECH 654 Compt. Fluid Flow and Heat Transfer (4 credits) 	<ul style="list-style-type: none"> • ATOC 512 Atmospheric and Oceanic Dynamics (3 credits) • ATOC 513 Waves and Stability (3 credits) • ATOC 515 Turbulence in Atmosphere and Oceans (3 credits) • CIVE 572 Computational Hydraulics (3 credits) • CIVE 603 Structural Dynamics (4 credits) • COMP 557 Fundamentals of Computer Graphics (3 credits) • COMP 558 Fundamentals of Computer Vision (3 credits) • COMP 567 Discrete Optimization 2 (3 credits) • COMP 621 Program Analysis and Transformations (4 credits) • COMP 642 Numerical Estimation Methods (4 credits) • COMP 767 Advanced Topics: Applications 2 (4 credits) • ECSE 507 Optimization and Optimal Control (3 credits) • ECSE 532 Computer Graphics (3 credits) • ECSE 547 Finite Elements in Electrical Engineering (3 credits) • ECSE 549 Expert Systems in Electrical Design (3 credits) • MATH 555 Fluid Dynamics (4 credits) • MATH 560 Optimization (4 credits) • MATH 761 Advanced Topics in Applied Mathematics 1 (4 credits) • MECH 533 Subsonic Aerodynamics (3 credits) • MECH 537 High-Speed Aerodynamics (3 credits) • MECH 538 Unsteady Aerodynamics (3 credits) • MECH 539 Computational Aerodynamics (3 credits) • MECH 541 Kinematic Synthesis (3 credits) • MECH 572 Introduction to Robotics (3 credits) • MECH 573 Mechanics of Robotic Systems (3 credits) • MECH 576 Geometry in Mechanics (3 credits) • MECH 577 Optimum Design (3 credits) • MECH 610 Fundamentals of Fluid Dynamics (4 credits) • MECH 620 Advanced Computational Aerodynamics (4 credits) • MECH 632 Theory of Elasticity (4 credits) • MECH 642 Advanced Dynamics (4 credits) • MECH 650 Fundamentals of Heat Transfer (4 credits) • MECH 654 Compt. Fluid Flow and Heat Transfer (4 credits)

Ac-13-56

8.0 Consultation with Related Units

Yes No

Financial Consult

Yes No

Attach list of consultations

9. Approvals

Routing Sequence

Name

Signature

Date

Department

Gregory Dudek, Director

[Signature]

November 26 2013

Curric/Acad Committee

[Signature]

[Signature]

Nov 26, 2013

Faculty 1 *Su*

[Signature]

[Signature]

Nov 6, 18/2014

Faculty 2

[Signature]

[Signature]

Faculty 3

SCTP

GS

APPC

Senate

Submitted by

Name

Bettina Kemme

To be completed by ARR:

Phone

CIP Code

Email

Submission Date