



<p>1.0 Degree Title Specify the two degrees for concurrent degree programs</p> <p>M.Sc.</p> <p>1.1 Major (Legacy= Subject) (30-char. max.)</p> <p>Computer Science</p> <p>1.2 Concentration (Legacy = Concentration/Option) If applicable (30 char. max.)</p> <p>Computational Science and Engineering</p> <p>1.3 Minor (with Concentration, if applicable) (30 char. max.)</p> <p></p> <p>1.4 Category</p> <table border="0"> <tr> <td><input type="checkbox"/> Faculty Program (FP)</td> <td><input type="checkbox"/> Honours (HON)</td> </tr> <tr> <td><input type="checkbox"/> Major</td> <td><input type="checkbox"/> Joint Honours Component (HC)</td> </tr> <tr> <td><input type="checkbox"/> Joint Major</td> <td><input type="checkbox"/> Internship/Co-op</td> </tr> <tr> <td><input type="checkbox"/> Major Concentration (CON)</td> <td><input checked="" type="checkbox"/> Thesis (T)</td> </tr> <tr> <td><input type="checkbox"/> Minor</td> <td><input type="checkbox"/> Non-Thesis (N)</td> </tr> <tr> <td><input type="checkbox"/> Minor Concentration (CON)</td> <td><input type="checkbox"/> Other</td> </tr> </table> <p>Please specify</p> <p></p> <p>1.5 Complete Program Title</p> <p>M.Sc. in Computer Science (Thesis) - Computational Science and Engineering Option/Concentration</p>	<input type="checkbox"/> Faculty Program (FP)	<input type="checkbox"/> Honours (HON)	<input type="checkbox"/> Major	<input type="checkbox"/> Joint Honours Component (HC)	<input type="checkbox"/> Joint Major	<input type="checkbox"/> Internship/Co-op	<input type="checkbox"/> Major Concentration (CON)	<input checked="" type="checkbox"/> Thesis (T)	<input type="checkbox"/> Minor	<input type="checkbox"/> Non-Thesis (N)	<input type="checkbox"/> Minor Concentration (CON)	<input type="checkbox"/> Other	<p>2.0 Administering Faculty/Unit</p> <p>Graduate Studies</p> <p>Offering Faculty/Department</p> <p>Science / School of Computer Science</p> <p>3.0 Effective Term of revision or retirement Please give reasons in 8.0 "Rationale" in the case of retirement (Ex. Sept. 2004 = 200409)</p> <p>Term</p> <p>201001</p> <p>4.0 Existing Credit Weight Proposed Credit Weight</p> <p>50 46</p> <p>5.0 Description (Maximum 150 words)</p> <p></p>
<input type="checkbox"/> Faculty Program (FP)	<input type="checkbox"/> Honours (HON)												
<input type="checkbox"/> Major	<input type="checkbox"/> Joint Honours Component (HC)												
<input type="checkbox"/> Joint Major	<input type="checkbox"/> Internship/Co-op												
<input type="checkbox"/> Major Concentration (CON)	<input checked="" type="checkbox"/> Thesis (T)												
<input type="checkbox"/> Minor	<input type="checkbox"/> Non-Thesis (N)												
<input type="checkbox"/> Minor Concentration (CON)	<input type="checkbox"/> Other												

<p>6.0 List of existing program and proposed program</p> <p>Existing program (list courses as follows: Subj Code/Crse Num, Title, Credit weight, under the headings of: Required Courses, Complementary Courses, Elective Courses)</p> <p>M.Sc. in Computer Science (Thesis) - Computational Science and Engineering Option/Concentration (50 credits)</p> <p>Required Courses (5 credits) COMP 601 (4) Special Topics in Computer Science COMP 669D1/D2 (1) CSE Seminar</p> <p>Complementary Courses (minimum 21 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.</p>	<p>Proposed program (list courses as follows: Subj Code/Crse Num, Title, Credit weight, under the headings of: Required Courses, Complementary Courses, Elective Courses)</p> <p>M.Sc. in Computer Science (Thesis) - Computational Science and Engineering Option/Concentration (46 credits)</p> <p>Required Courses (1 credit) COMP 669D1/D2 (1) CSE Seminar</p> <p>Complementary Courses (minimum 21 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.</p> <p>Note: Students in the B.Sc./M.Sc. (Thesis) track can substitute one 3-credit course by COMP 696 and one 4-credit course by COMP 697, but still need to take two courses from List A and two courses from List B.</p>
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6.0 (Continued) 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)

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

List B - Applications and Specialized Methods Courses:
ATOC 512 (3) Atmospheric and Oceanic Dynamics
ATOC 513 (3) Waves and Stability
ATOC 515 (3) Turbulence in Atmosphere and Oceans
CIVE 514 (3) Structural Mechanics
CIVE 572 (3) Computational Hydraulics
CIVE 603 (4) Structural Dynamics
CIVE 613 (4) Numerical Methods: Structural Engineering
COMP 505 (3) Advanced Computer Architecture
COMP 557 (3) Fundamentals of Computer Graphics
COMP 558 (3) Fundamentals of Computer Vision
COMP 567 (3) Discrete Optimization 2
COMP 621 (4) Optimizing Compilers
COMP 642 (4) Numerical Estimation Methods
COMP 767 (3) Advanced Topics: Applications 2
ECSE 507 (3) Optimization and Optimal Control
ECSE 532 (3) Computer Graphics
ECSE 547 (3) Finite Elements in Electrical Engineering
ECSE 549 (3) Expert Systems in Electrical Design
MATH 555 (4) Fluid Dynamics
MATH 560 (4) Optimization
MATH 651 (4) Asymptotic Expansion and Perturbation Methods
MATH 761 (4) Topics in Applied Math 1
MECH 533 (3) Subsonic Aerodynamics
MECH 537 (3) High-Speed Aerodynamics
MECH 538 (3) Unsteady Aerodynamics
MECH 539 (3) Computational Aerodynamics
MECH 541 (3) Kinematic Synthesis
MECH 545 (3) Advanced Stress Analysis
MECH 572 (3) Introduction to Robotics
MECH 573 (3) Mechanics of Robotic Systems
MECH 576 (3) Computer Graphics and Geometrical Modelling
MECH 577 (3) Optimum Design
MECH 610 (4) Fundamentals of Fluid Dynamics
MECH 620 (4) Advanced Computational Aerodynamics
MECH 632 (4) Theory of Elasticity
MECH 642 (4) Advanced Dynamics
MECH 650 (4) Heat Transfer
MECH 654 (4) Compt. Fluid Flow and Heat Transfer

Thesis Component - Required(24 credits)
COMP 698 (9) Thesis Research 1
COMP 699 (15) Thesis Research 2

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

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

List B - Applications and Specialized Methods Courses:
ATOC 512 (3) Atmospheric and Oceanic Dynamics
ATOC 513 (3) Waves and Stability
ATOC 515 (3) Turbulence in Atmosphere and Oceans
CIVE 514 (3) Structural Mechanics
CIVE 572 (3) Computational Hydraulics
CIVE 603 (4) Structural Dynamics
CIVE 613 (4) Numerical Methods: Structural Engineering
COMP 505 (3) Advanced Computer Architecture
COMP 557 (3) Fundamentals of Computer Graphics
COMP 558 (3) Fundamentals of Computer Vision
COMP 567 (3) Discrete Optimization 2
COMP 621 (4) Optimizing Compilers
COMP 642 (4) Numerical Estimation Methods
COMP 767 (3) Advanced Topics: Applications 2
ECSE 507 (3) Optimization and Optimal Control
ECSE 532 (3) Computer Graphics
ECSE 547 (3) Finite Elements in Electrical Engineering
ECSE 549 (3) Expert Systems in Electrical Design
MATH 555 (4) Fluid Dynamics
MATH 560 (4) Optimization
MATH 651 (4) Asymptotic Expansion and Perturbation Methods
MATH 761 (4) Topics in Applied Math 1
MECH 533 (3) Subsonic Aerodynamics
MECH 537 (3) High-Speed Aerodynamics
MECH 538 (3) Unsteady Aerodynamics
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MECH 620 (4) Advanced Computational Aerodynamics
MECH 632 (4) Theory of Elasticity
MECH 642 (4) Advanced Dynamics
MECH 650 (4) Heat Transfer
MECH 654 (4) Compt. Fluid Flow and Heat Transfer

Thesis Component – Required (minimum 24 credits)
at least 24 credits, selected from:

<u>COMP 691</u>	<u>(2)</u>	<u>Thesis Research 1</u>
<u>COMP 696</u>	<u>(3)</u>	<u>Thesis Research 2</u>
<u>COMP 697</u>	<u>(4)</u>	<u>Thesis Research 3</u>
COMP 698	(9)	Thesis Research 4
COMP 699	(15)	Thesis Research 5

7.0 Consultation with Related Units	<input type="checkbox"/>	<input checked="" type="checkbox"/>	Yes	No	Financial Consult	<input type="checkbox"/>	<input type="checkbox"/>	Yes	No
Attach list of consultations.									

8.0	<p>This modification achieves several purposes:</p> <ol style="list-style-type: none"> 1) It allows the implementation of the new B.Sc./M.Sc. (Thesis) track. 2) It reduces to 46 the number of credits for the CSE Option. This is achieved by removing COMP 601 (reading course) from the list of required courses. 3) To afford additional flexibility to students who need to maintain a full time registration status, we introduce three new thesis courses, COMP 691 (2 credits), COMP 696 (3 credits), and COMP 697 (4 credits). The total number of required thesis credits remains unchanged.
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9.0 Approvals

Routing Sequence	Name	Signature	Date
Department	<input style="width: 100%;" type="text"/>	<input style="width: 100%;" type="text"/>	<input style="width: 100%;" type="text"/>
Curric/Acad Committee	<input style="width: 100%;" type="text"/>	<input style="width: 100%;" type="text"/>	<input style="width: 100%;" type="text"/>
Faculty 1	<input style="width: 100%;" type="text"/>	<input style="width: 100%;" type="text"/>	<input style="width: 100%;" type="text"/>
Faculty 2	<input style="width: 100%;" type="text"/>	<input style="width: 100%;" type="text"/>	<input style="width: 100%;" type="text"/>
Faculty 3	<input style="width: 100%;" type="text"/>	<input style="width: 100%;" type="text"/>	<input style="width: 100%;" type="text"/>
SCTP	<input style="width: 100%;" type="text"/>	<input style="width: 100%;" type="text"/>	<input style="width: 100%;" type="text"/>
GS	<input style="width: 100%;" type="text"/>	<input style="width: 100%;" type="text"/>	<input style="width: 100%;" type="text"/>
APPC	<input style="width: 100%;" type="text"/>	<input style="width: 100%;" type="text"/>	<input style="width: 100%;" type="text"/>
Senate	<input style="width: 100%;" type="text"/>	<input style="width: 100%;" type="text"/>	<input style="width: 100%;" type="text"/>
Submitted by			

Name	<input style="width: 100%;" type="text"/>	To be completed by ARR:
Phone	<input style="width: 100%;" type="text"/>	CIP Code
Email	<input style="width: 100%;" type="text"/>	
Submission Date	<input style="width: 100%;" type="text"/>	