1.0 Degree Title
Specify the two degrees for concurrent degree programs

| M.Sc. |

1.1 Major (Legacy= Subject) (30-char. max.)
Atmospheric & Oceanic Sciences

1.2 Concentration (Legacy = Concentration/Option)
If applicable (30 char. max.)
Computational Science and Engineering

1.3 Minor (with Concentration, if applicable)
(30 char. max.)

1.4 Category

- Faculty Program (FP)
- Joint Major
- Major Concentration (CON)
- Minor
- Minor Concentration (CON)
- Honours (HON)
- Joint Honours Component (HC)
- Internship/Co-op
- Thesis (T)
- Non-Thesis (N)
- Other
- Please specify

1.5 Complete Program Title
M.Sc. in Atmospheric & Oceanic Sciences; Computational Science & Engineering

2.0 Administering Faculty/Unit

[Blank]

2.1 Offering Faculty/Department
Science / Atmospheric & Oceanic Sciences

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

| Term: 200901 |

4.0 Existing Credit Weight
46 credits

| Proposed Credit Weight | 46 credits |

5.0 Rationale for revised program

This revision will serve to correct an earlier oversight regarding the course ATOC 512. As ATOC 512 is required of all M.Sc. in Atmospheric and Oceanic Sciences and all M.Sc. in Atmospheric and Oceanic Sciences; Computational Science & Engineering students, ATOC 512 should appear only in the 'Required' course section of the program description, and not in the 'Complementary' course section. This change does not affect other departments offering the Computational Science & Engineering option; it simply removes the course from the list of complementary courses to choose from for students registered in Atmospheric & Oceanic Sciences. As well, ATOC 530 and 620 are no longer being offered yearly, and so are replaced by ATOC 531 and 621 respectively. Also, as ATOC 669N1 and ATOC 669N2 are presently inactive, these will be removed from the 'Required' course section.

6.0 Revised Program Description (Maximum 150 words)

[The Program Description will not change.]
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)

Required (30 credits)
ATOC 669D1 CSE Seminar (.5) and
ATOC 669D2 CSE Seminar (.5)
or ATOC 669N1 CSE Seminar (.5) and
ATOC 669N2 CSE Seminar (.5)
ATOC 512 Atmospheric and Climate Dynamics (3)
ATOC 530 Climate Dynamics 1 (3)
ATOC 540 Synoptic Meteorology 1 (3)
ATOC 546 Current Weather Discussion (1)
ATOC 669D2 CSE Seminar (.5)
ATOC 669D1 CSE Seminar (.5)
ATOC 620 Physical Meteorology 1 (3)
ATOC 694 Master’s Thesis Progress Report and Seminar (3)
ATOC 699 Master’s Thesis (12)

Complementary (minimum 16 credits)
Two courses from list A, two courses from list B, and the remaining credits to be chosen from graduate courses (500- or 600-level) in the Department of Atmospheric and Oceanic Sciences. Two complementary courses, at the 500- or 600-level, must be taken outside the Department of Atmospheric and Oceanic Sciences.

List A: Scientific Computing courses
CIVE 602 Finite Element Analysis (4)
MECH 642 Advanced Dynamics (4)
MECH 632 Theory of Elasticity (4)
MECH 620 Advanced Computational Aerodynamics (4)
MECH 610 Fundamentals of Fluid Dynamics (4)
MECH 577 Optimum Design (3)
MECH 576 Computer Graphics & Geometrical Modelling (3)
MECH 573 Mechanics of Robotic Systems (3)
MECH 572 Introduction to Robotics (3)
MECH 567 Numerical Analysis (4)
MECH 566 Discrete Organization 1 (3)

List B: Applications and Specialized Methods courses
ATOC 512 Atmospheric and Oceanic Dynamics (3)
ATOC 513 Waves & Stability (3)
ATOC 515 Turbulence in Atmosphere & Oceans (3)
CIVE 514 Structural Mechanics (3)
CIVE 572 Computational Hydraulics (3)
CIVE 603 Structural Dynamics (3)
CIVE 613 Numerical Methods in Structural Engineering (4)
COMP 505 High-Performance Computer Architecture (3)
COMP 557 Fundamentals of Computer Graphics (3)
COMP 556 Discrete Organization 1 (3)
COMP 558 Numerical Differential Equations (4)

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

Required (30 credits)
ATOC 669D1 CSE Seminar (.5) and
ATOC 669D2 CSE Seminar (.5)
ATOC 512 Atmospheric and Climate Dynamics (3)
ATOC 531 Climate Dynamics 2 (3)
ATOC 540 Synoptic Meteorology 1 (3)
ATOC 546 Current Weather Discussion (1)
ATOC 550 Special Topics Meteorology & Oceanography (1)
ATOC 621 Physical Meteorology 2 (3)
ATOC 694 Master’s Thesis Progress Report and Seminar (3)
ATOC 699 Master’s Thesis (12)

Complementary (minimum 16 credits)
Two courses from list A, two courses from list B, and the remaining credits to be chosen from graduate courses (500- or 600-level) in the Department of Atmospheric and Oceanic Sciences. Two complementary courses, at the 500- or 600-level, must be taken outside the Department of Atmospheric and Oceanic Sciences.

List A: Scientific Computing courses
CIVE 602 Finite Element Analysis (4)
COMP 522 Modelling and Simulation (4)
COMP 540 Matrix Computations (3)
COMP 566 Discrete Organization 1 (3)
CIVE 572 Computational Hydraulics (3)
MATH 578 Numerical Analysis (4)
MATH 579 Numerical Differential Equations (4)

List B: Applications and Specialized Methods courses
ATOC 512 Atmospheric and Oceanic Dynamics (3)
ATOC 513 Waves & Stability (3)
ATOC 515 Turbulence in Atmosphere & Oceans (3)
CIVE 514 Structural Mechanics (3)
CIVE 572 Computational Hydraulics (3)
CIVE 603 Structural Dynamics (3)
CIVE 613 Numerical Methods in Structural Engineering (4)
COMP 505 High-Performance Computer Architecture (3)
COMP 557 Fundamentals of Computer Graphics (3)
COMP 556 Discrete Organization 1 (3)
COMP 558 Numerical Differential Equations (4)

Students registered in M.Sc. programs are expected to regularly attend both the student seminar series (ATOC 751 D1/D2 or ATOC 752 D1/D2) and the Departmental seminar series during the entire period of their enrollment in the program.
### 9. Approvals

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Attach list of consultations

Submitted by

Name
Phone
Email
Submission Date

To be completed by ARR:

CIP Code