1.0 Degree Title
Specify the two degrees for concurrent degree programs

| Bachelor of Science |

1.1 Major (Legacy= Subject) (30-char. max.)

| |

1.2 Concentration (Legacy = Concentration/Option)
If applicable (30 char. max.)

| |

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

| |

1.4 Category

- Faculty Program (FP)
- Major
- 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

| Honours in Applied Mathematics |

2.0 Administering Faculty/Unit

Science / Mathematics and Statistics

Offering Faculty/Department

Mathematics and Statistics

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

| 200409 |

4.0 Existing Credit Weight

| 68 Credits |

Proposed Credit Weight

| |

5.0 Rationale for revised program

1) The change is to implement the course MATH 533 in the Honours Program in Applied Mathematics.

2) Enrollment considerations dictate that MATH 387 and MATH 397 cannot be offered every year. In order to allay problems that students might have in fulfilling the existing program requirements, we are replacing the required course MATH 387 with a group of complementaries which force the students to take either MATH 387 or MATH 397.

6.0 Revised Program Description (Maximum 150 words)

No 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)

**HONOURS IN APPLIED MATHEMATICS**
((68 credits))

Aside from seeking to develop a sound basis in Applied Mathematics, one of the objectives of the program is to kindle the students' interest in possible areas of application. The extra-mural courses are included to ensure that the student has some appreciation of the scope of Applied Mathematics and is familiar with at least one of the diverse areas in which applications can be found.

**Required Courses**
((39 credits))

- COMP 252*  (3)  Algorithms and Data Structures
- COMP 250*  (3)  Introduction to Computer Science
- MATH 235  (3)  Algebra 1
- MATH 242  (3)  Analysis 1
- MATH 248  (3)  Honours Advanced Calculus
- MATH 251  (3)  Honours Algebra 2
- MATH 255  (3)  Honours Analysis 2
- MATH 325  (3)  Honours Ordinary Differential Equations
- MATH 356  (3)  Honours Probability
- MATH 357  (3)  Honours Statistics
- MATH 366  (3)  Honours Complex Analysis
- or MATH 249  (3)  Honours Complex Variables
- MATH 375  (3)  Honours Partial Differential Equations
- MATH 376  (3)  Honours Nonlinear Dynamics and Chaos
- MATH 380  (3)  Honours Differential Geometry

**Complementary Courses**
((29 credits))

at least 6 credits selected from:

- MATH 350  (3)  Graph Theory and Combinatorics
- MATH 354  (3)  Honours Analysis 3
- MATH 355  (3)  Honours Analysis 4
- MATH 370  (3)  Honours Algebra 3
- MATH 371  (3)  Honours Algebra 4
- MATH 380  (3)  Honours Differential Geometry

at least 9 credits selected from:

- MATH 352  (1)  Problem Seminar
- MATH 376  (3)  Honours Nonlinear Dynamics and Chaos
- MATH 397  (3)  Honours Matrix Numerical Analysis
- MATH 407  (3)  Dynamic Programming
- MATH 523  (4)  Honours Matrix Numerical Analysis
- MATH 570  (3)  Honours Project
- MATH 478  (3)  Mathematical Programming
- MATH 490  (3)  Mathematics of Finance
- MATH 523  (4)  Generalized Linear Models
- MATH 525  (4)  Generalized Linear Models
- MATH 525  (4)  Sampling Theory and Applications
- MATH 552  (4)  Combinatorial Optimization
- MATH 555  (4)  Fluid Dynamics
- MATH 555  (4)  Fluid Dynamics
- MATH 559  (4)  Honours Partial Differential Equations
- MATH 560  (4)  Optimization
- MATH 561  (4)  Analytical Mechanics
- MATH 574  (4)  Ordinary Differential Equations
- MATH 575  (4)  Partial Differential Equations
- MATH 576  (4)  Partial Differential Equations
- MATH 578  (4)  Numerical Analysis 1
- MATH 578  (4)  Numerical Analysis 1
- MATH 580  (4)  Applied Partial Differential Equations 1
- MATH 581  (4)  Applied Partial Differential Equations 2

MATH 397  (3) Honours Matrix Numerical Analysis
MATH 387  (3) Honours Numerical Analysis

Complementary Courses
((32 credits))
at least 3 credits selected from:

- MATH 387  (3) Honours Numerical Analysis
- MATH 397  (3) Honours Matrix Numerical Analysis
- MATH 397  (3) Honours Matrix Numerical Analysis
- MATH 470  (3) Honours Project
- MATH 487  (3) Mathematical Programming
- MATH 523  (4) Generalized Linear Models
- MATH 525  (4) Sampling Theory and Applications
- MATH 533  (4) Honours Regression and Analysis of Variance
- MATH 552  (4) Combinatorial Optimization
- MATH 555  (4) Fluid Dynamics
- MATH 556  (4) Mathematical Statistics 1
- MATH 557  (4) Mathematical Statistics 2
- MATH 559  (4) Fluid Dynamics
- MATH 560  (4) Optimization
- MATH 561  (4) Analytical Mechanics
- MATH 574  (4) Ordinary Differential Equations
- MATH 575  (4) Partial Differential Equations
- MATH 576  (4) Partial Differential Equations
- MATH 578  (4) Numerical Analysis 1
- MATH 579  (4) Numerical Differential Equations
- MATH 580  (4) Applied Partial Differential Equations 1
- MATH 581  (4) Applied Partial Differential Equations 2

and the following, for which half credit only may be counted:

- MATH 204  (3) Principles of Statistics 2
- MATH 407  (3) Dynamic Programming
- MATH 423  (3) Regression and Analysis of Variance
- MATH 447  (3) Stochastic Processes

12 credits of extra-mural courses:
chosen in consultation with the student's adviser from approved courses in other departments.

A list of such courses is available from the Department of Mathematics and Statistics. Student initiative is encouraged in suggesting other courses that fulfill the intentions of this section as described above. Such suggestions must receive departmental approval. They must be in a field related to Applied Mathematics such as Environmental and Oceanic Science, Biology, Biochemistry, Chemistry, Computer Science, Earth and Planetary Science, Economics, Engineering, Management, Physics, Physiology and Psychology. At least 6 credits must be chosen from a single department other than Computer Science.

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

**HONOURS IN APPLIED MATHEMATICS**
((68 credits))

Aside from seeking to develop a sound basis in Applied Mathematics, one of the objectives of the program is to kindle the students' interest in possible areas of application. The extra-mural courses are included to ensure that the student has some appreciation of the scope of Applied Mathematics and is familiar with at least one of the diverse areas in which applications can be found.

**Required Courses**
((36 credits))

- COMP 252*  (3)  Algorithms and Data Structures
- COMP 250*  (3)  Introduction to Computer Science
- MATH 235  (3)  Algebra 1
- MATH 242  (3)  Analysis 1
- MATH 248  (3)  Honours Advanced Calculus
- MATH 251  (3)  Honours Algebra 2
- MATH 255  (3)  Honours Analysis 2
- MATH 325  (3)  Honours Ordinary Differential Equations
- MATH 356  (3)  Honours Probability
- MATH 357  (3)  Honours Statistics
- MATH 366  (3)  Honours Complex Analysis
- or MATH 249  (3)  Honours Complex Variables
- MATH 375  (3)  Honours Partial Differential Equations

*COMP 250 may be preceded by COMP 202

**Complementary Courses**
((32 credits))
at least 3 credits selected from:

- MATH 387  (3) Honours Numerical Analysis
- MATH 397  (3) Honours Matrix Numerical Analysis
- MATH 397  (3) Honours Matrix Numerical Analysis
- MATH 470  (3) Honours Project
- MATH 487  (3) Mathematical Programming
- MATH 523  (4) Generalized Linear Models
- MATH 525  (4) Sampling Theory and Applications
- MATH 533  (4) Honours Regression and Analysis of Variance
- MATH 552  (4) Combinatorial Optimization
- MATH 555  (4) Fluid Dynamics
- MATH 556  (4) Mathematical Statistics 1
- MATH 557  (4) Mathematical Statistics 2
- MATH 559  (4) Fluid Dynamics
- MATH 560  (4) Optimization
- MATH 561  (4) Analytical Mechanics
- MATH 574  (4) Ordinary Differential Equations
- MATH 575  (4) Partial Differential Equations
- MATH 576  (4) Partial Differential Equations
- MATH 578  (4) Numerical Analysis 1
- MATH 579  (4) Numerical Differential Equations
- MATH 580  (4) Applied Partial Differential Equations 1
- MATH 581  (4) Applied Partial Differential Equations 2

and the following, for which half credit only may be counted:

- MATH 204  (3) Principles of Statistics 2
- MATH 407  (3) Dynamic Programming
- MATH 447  (3) Stochastic Processes

12 credits of extra-mural courses:
chosen in consultation with the student's adviser from approved courses in other departments.

A list of such courses is available from the Department of Mathematics and Statistics. Student initiative is encouraged in suggesting other courses that fulfill the intentions of this section as described above. Such suggestions must receive departmental approval. They must be in a field related to Applied Mathematics such as Environmental and Oceanic Science, Biology, Biochemistry, Chemistry, Computer Science, Earth and Planetary Science, Economics, Engineering, Management, Physics, Physiology and Psychology. At least 6 credits must be chosen from a single department other than Computer Science.
### 8.0 Consultation with Related Units

- Financial Consult: No

Attach list of consultations

### 9. Approvals

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Submitted by

- Name: 
- Phone: 
- Email: 
- Submission Date: 

To be completed by ARR:

- CIP Code: