**Joint Major Program in Statistics and Computer Science**

**1.0 Degree Title**
Please specify the two degrees for concurrent degree programs

Bachelor of Science

**2.0 Administering Faculty/Unit**

Science

**1.1 Major (Legacy= Subject)(30-char. Max.)**

Joint Major Statistics and Computer Science

**2.0 Administering Faculty/Unit**

Offering Faculty/Department

Science / Mathematics and Statistics

**1.2 Concentration (Legacy = Concentration/Option)**
If applicable to Majors only (30 char. max.)

**3.0 Effective Term of Implementation**

(Ex. Sept. 2004 = 200409)

Term

200709

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

**4.0 Rationale for new proposal**

This new program provides an interesting combination of disciplines which would be of great interest to students and prospective applicants.

**5.0 Program Information**
Please check appropriate box(es)

**5.1 Program Type**

- [x] Bachelor's Program
- [ ] Master's
- [ ] M.Sc. (Applied) Program
- [ ] Dual Degree/Concurrent Program
- [ ] Certificate
- [ ] Diploma
- [ ] Graduate Certificate
- [ ] Graduate Diploma
- [ ] Ph.D. Program
- [ ] Doctorate Program (Other than Ph.D.)
- [ ] Private Program
- [ ] Off-Campus Program
- [ ] Distance Education Program (By Correspondence)
- [ ] Other (Please specify)

**5.2 Category**

- [ ] Faculty Program (FP)
- [ ] Major
- [x] 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

**5.3 Level**

- [x] Undergraduate
- [ ] Dentistry/Law/Medicine
- [ ] Continuing Ed (Non-Credit)
- [ ] Collegial
- [ ] Masters & Grad Dips & Certs
- [ ] Doctorate
- [ ] Post-Graduate Medicine/Dentistry
- [ ] Graduate Qualifying
- [ ] Postdoctoral Fellows

**5.4 Related Units**

Yes [x] No [ ]

**5.5 Financial Consult**

Yes [x] No [ ]

**5.6 Attach list of consultations.**

**6.0 Total Credits**

72

**7.0 Consultation with Related Units**

Yes [x] No [ ]

**7.0 Financial Consult**

Yes [x] No [ ]

Attach list of consultations.
8.0 Program Description (Maximum 150 words)

This program seeks to provide a solid training in both computer science and statistics together with the necessary mathematical background. With the advent of statistical endeavours involving ever increasing amounts of data, some students may desire a training in both disciplines.

9.0 List of proposed program for the New Program/Major or Minor/Concentration.

If new concentration (option) of existing Major/Minor (program), please attach a program layout (list of all courses) of existing Major/Minor.

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

**Joint Major Program in Statistics and Computer Science (72 credits)**

Students entering the Joint Major program in Statistics and Computer Science are normally expected to have completed MATH 133, MATH 140, MATH 141 and COMP 202 or their equivalents. Otherwise they will be required to make up any deficiencies in these courses over and above the 72 credits of courses in the program specification.

**Required Courses (48 credits)**

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Credit</th>
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<tbody>
<tr>
<td>COMP 206</td>
<td>Introduction to Software Systems</td>
<td>3</td>
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<tr>
<td>COMP 250</td>
<td>Introduction to Computer Science</td>
<td>3</td>
</tr>
<tr>
<td>COMP 251</td>
<td>Data Structures and Algorithms</td>
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</tr>
<tr>
<td>COMP 273</td>
<td>Introduction to Computer Systems</td>
<td>3</td>
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<tr>
<td>COMP 302</td>
<td>Programming Languages and Paradigms</td>
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<td>COMP 330</td>
<td>Theoretical Aspects Computer Science</td>
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<tr>
<td>COMP 350</td>
<td>Numerical Computing</td>
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<tr>
<td>or MATH 317</td>
<td>Numerical Analysis</td>
<td>3</td>
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<tr>
<td>COMP 360</td>
<td>Algorithm Design Techniques</td>
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<tr>
<td>MATH 222</td>
<td>Calculus 3</td>
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<td>MATH 236</td>
<td>Algebra 2</td>
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<tr>
<td>or MATH 223</td>
<td>Linear Algebra</td>
<td>3</td>
</tr>
<tr>
<td>MATH 242</td>
<td>Analysis 1</td>
<td>3</td>
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<td>MATH 314</td>
<td>Advanced Calculus</td>
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<td>MATH 323</td>
<td>Probability</td>
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<tr>
<td>MATH 324</td>
<td>Statistics</td>
<td>3</td>
</tr>
<tr>
<td>MATH 423</td>
<td>Regression and Analysis of Variance</td>
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</table>

*Students with no basic knowledge of any high level programming language (e.g. Fortran, Basic, Pascal, C, C++, Java) are advised to take COMP 202 before COMP 250. In this case COMP 202 counts as an elective.

**Complementary Courses (24 credits)**

12 credits in Mathematics selected as follows:

- At least 3 credits selected from
  - MATH 447 (3) Stochastic Processes
  - MATH 523 (4) Generalized Linear Models
  - MATH 524 (4) Nonparametric Statistics
  - MATH 525 (4) Sampling Theory and Applications

The remaining Mathematics credits selected from

- MATH 327 (3) Matrix Numerical Analysis
- MATH 340 (3) Discrete Structures
- or MATH 350 (3) Graph Theory and Combinatorics
- MATH 352 (1) Problem Seminar
- MATH 410 (3) Majors Project
- MATH 578* (4) Numerical Analysis 1

12 credits in Computer Science selected as follows:

- At least 6 credits selected from
  - COMP 423 (3) Data Compression
  - COMP 424 (3) Topics: Artificial Intelligence 1
  - COMP 462 (3) Computational Biology Methods
  - COMP 490 (3) Introduction to Probabilistic Analysis of Algorithms
  - COMP 526 (3) Probabilistic Reasoning and AI
  - COMP 540* (3) Matrix Computation
  - COMP 547 (4) Cryptography and Data Security
  - COMP 564 (3) Computational Gene Regulation
  - COMP 566 (3) Discrete Optimization 1
  - COMP 567 (3) Discrete Optimization 2

*The remaining Computer Science credits selected from COMP courses at the 300 level or above except COMP 396, COMP 400 and COMP 431.

*MATH 578 and COMP 540 cannot both be taken for program credit.
### 10.0 Approvals

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<tr>
<th>Routing Sequence</th>
<th>Name</th>
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<tbody>
<tr>
<td>Department</td>
<td>S. W. Drury</td>
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<td>Curric/Acad Committee</td>
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**Submitted by**

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<tr>
<th>Name</th>
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<th>Submission Date</th>
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**To be completed by ARR:**

- CIP Code: 

*New Program/Major or Minor/ Concentration Proposal Form P1-3*