

# SIMON FRASER UNIVERSITY

## Senate Committee on University Priorities Memorandum

TO: Senate

FROM: John Waterhouse  
Chair, SCUP  
Vice President, Academic

RE: Proposal for a Joint Major in  
Computational Linguistics in the Faculties  
of Arts and Social Sciences, and Applied Sciences (SCUP 05-067)

DATE: December 14, 2005

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At its November 23, 2005 meeting SCUP reviewed and approved the proposal from the Faculty of Arts and Social Sciences and the Faculty of Applied Sciences for a Joint Major in Computational Linguistics.

### Motion

That Senate approve and recommend to the Board of Governors, the proposal for a Joint Major in Computational Linguistics in the Faculty of Arts and Social Sciences and the Faculty of Applied Sciences.

encl.

c: M. Taboada  
F. Popowich

SIMON FRASER UNIVERSITY  
Office of the Dean, Faculty of Arts and Social Sciences  
MEMORANDUM

To: Jo Hinchliffe  
Secretary, Senate Committee  
on Undergraduate Studies

From: Mary Ann Gillies  
Chair, Faculty of Arts  
and Social Sciences  
Curriculum Committee

Subject: Department of Linguistics  
New Joint Major in  
Computational Linguistics

Date: May 13, 2005

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The Faculty of Arts and Social Sciences Curriculum Committee, at its meeting of May 12, 2005, approved the attached Joint Major Program in Computational Linguistics.

Would you please put this item on the agenda of the next meeting of S.C.U.S.?

Thank you.



Mary Ann Gillies, Chair  
Faculty of Arts and Social Sciences  
Curriculum Committee

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encl.

**SIMON FRASER UNIVERSITY**  
**DEPARTMENT OF LINGUISTICS**  
**MEMORANDUM**

**To:** Sarah Dench, Secretary, Senate Committee on University Priorities

**From:** Fred Popowich, Maite Taboada

**Date:** December 13, 2005

**Subject:** Joint Major in Computational Linguistics

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The following proposal is being submitted to both the School of Computing Science, and the Department of Linguistics. Both the Department of Linguistics and the School of Computing Science have faculty members who have been involved in computational linguistics research. From computing science, the list includes Veronica Dahl, Bob Hadley, Fred Popowich and Anoop Sarkar. The linguistics department has Chung-Hye Han, Trude Heift, Paul McFetridge, and Maite Taboada.

[Note: the proposal was approved by the Department of Linguistics at a meeting on January 20, 2005. It has also been approved by Computing Science. The Faculty of Arts and Social Sciences Curriculum Committee approved it at its meeting of May 12, 2005. The current document is a result of modifications suggested at the meeting of the Senate Committee on University Priorities on November 23, 2005.]

### **1. Introduction**

A B.Sc./B.A. degree program (major) is proposed as a joint program of the School of Computing Science and the Department of Linguistics, to be administered under the Faculty of Applied Sciences.

The long-standing synergy and collaboration between Computing Science and Linguistics has culminated in the emergence of a research discipline called Computational Linguistics (CL). Research in CL has consequences for theories of human language as well as practical applications in information technology. Theoretical computational linguists develop formal models of the human language faculty and implement them as computer programs. These programs constitute the basis for evaluation and further development of the theories. Some of the applications using CL research include speech recognition software, web search engines, word processors (spell checkers, grammar checkers), information retrieval/extraction systems, and machine translation systems.

Given that all these systems store, process, and extract information as language, their development and implementation require skills in computing as well as a solid background in linguistics. This means that the ideal practitioners in CL fields are those who have received training in both disciplines. In fact, a number of students taking Computing Science courses already take Linguistics courses and vice versa, showing a demand for such a joint program.

The proposed program is an excellent fit for the curriculum reform initiative at SFU, combining as it does a rigorous training in quantitative, technical and formal skills, much exposure to analytic thinking and essay writing, and a great breadth of topics and methodologies from both the humanities and the information sciences. The students of the proposed joint program will have acquired formal reasoning and analytical skills together with a solid technical background. They will be well prepared for careers in information technology and related areas, or advanced research in graduate programs in various subfields in linguistics, computing science, as well as computational linguistics.

## **2. Proposed Calendar Description.**

The following text is proposed to be placed in the *Department of Linguistics* section under *Faculty of Arts and Social Sciences*.

### **Joint Major in Computing Science and Linguistics**

See “Joint Major in Computing Science and Linguistics” on page x.

The following text is proposed to be placed in the *School of Computing Science* section under *Faculty of Applied Sciences*.

### **Joint Major Program in Computing Science and Linguistics**

The School of Computing Science and the Department of Linguistics cooperate in offering a Joint Major program in the area of Computational Linguistics. The administrative home is within the Faculty of Applied Sciences for purposes of student registration, appeals and graduation processing. Interested students should contact advisors in both the Department of Linguistics and the School of Computing Science. Permission to enroll in the program must be obtained from both the Department of Linguistics and the School of Computing Science.

Program requirements below include sections labeled *CMPT Requirements* and *LING Requirements*. The requirements under these sections are intended to track corresponding requirements within the CMPT and LING Major programs, respectively.

### **Lower Division Requirements (46-51 credits)**

- MATH 151-3 Calculus I
- MATH 152-3 Calculus II
- MATH 232-3 Elementary Linear Algebra
- STAT 270-3 Introduction to Probability and Statistics OR BUEC 232-4 Data and Decisions I
- COGS 100-3 or one Social Science chosen from the list of Social Sciences Electives for the Computing Science lower division requirements.

### **CMPT Requirements**

- CMPT 120-3 and CMPT 125-3 Introduction to Computing Science and Programming I and II \*
- CMPT 150-3 Introduction to Computer Design
- CMPT 225-3 Data Structures
- CMPT 275-4 Software Engineering
- MACM 101-3 Discrete Mathematics I
- MACM 201-3 Discrete Mathematics II

\* (can be replaced by CMPT 126-3)

### **LING Requirements**

- LING 130-3 Practical Phonetics
- LING 220-3 Introduction to Linguistics
- LING 221-3 Introduction to Phonology
- LING 222-3 Introduction to Syntax

### **Upper Division Requirements**

#### **CMPT Requirements (27 credits)**

- CMPT 300-3 Operating Systems
- CMPT 307-3 Data Structures and Algorithms
- CMPT 320-3 Social Implications of a Computerized Society
- CMPT 413-3 Computational Linguistics

Choose four courses from distinct concentration areas:

- Computer Graphics and Multimedia
- Information Systems

- Programming Languages and Software
- Computing Systems (recommended: CMPT 379-3 Principles of Compiler Design)
- Theoretical Computer Science (recommended: CMPT 308-3 Computability and Complexity)

Plus, one additional 400 level course from any area.

### **LING Requirements (21 credits)**

- LING 321-3 Phonology
- LING 322-3 Syntax
- LING 400-3 Formal Linguistics or MACM 300-3 Introduction to Formal Languages and Automata with Applications

In addition, students must have 12 credit hours from:

- LING 323-3 Morphology
- LING 324-3 Semantics
- LING 330-3 Phonetics
- LING 401-3 Topics in Phonetics
- LING 405-3 Topics in Syntax
- LING 406-3 Topics in Semantics
- LING 480-3 Topics in Linguistics I (when offered with a suitable topic)
- LING 481-3 Topics in Linguistics II (when offered with a suitable topic)

For a B.A. from the Faculty of Arts and Social Sciences, students must fulfill the Faculty of Arts and Social Sciences requirements, such as the Breadth Requirements. For a B.Sc. from the Faculty of Applied Science, students must fulfill the Faculty of Applied Science requirements, such as the Residency Requirements.

Students are encouraged to enroll in the Cooperative Education Program.