Notice of Intent: Software Systems Major

Tom Shermer, Associate Director for Surrey, School of Computing Science

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Credential to be Awarded

B.Sc. (Bachelor of Science)

Location

SFU's Surrey Campus

School/Faculty Offering Program

Computing Science/Faculty of Applied Sciences

Anticipated Program Start Date

September 2008

Description of Proposed Program

A computing major focused on software development and software engineering.

Aims, goals and/or objectives

The aim of this program is to provide students with the skills, knowledge, and thought-processes necessary for the production of professional software, while at the same time giving them a broad background in the types of computing systems they are likely to encounter over the course of their careers.

Anticipated contribution to the mandate and strategic plan of the institution

This program directly fits into the applied, high-tech focus of the Surrey campus, and we anticipate strong ties and natural joint program development with other Surrey programs, including Mechatronics Engineering, Business, and Interactive Arts and Technology.

Target audience

The program is targeted at students with a concrete, hands-on learning style, entering university from high school.

The program is designed for students who are interested in the creation and design of technology, but have a more concrete learning style and want more immediately applicable software development skills. Our existing major focuses more on abstract concepts, and some students have difficulties with this approach. We also hope to attract students who have a greater interest in software development and software engineering than can be met by our existing major.

Content

The curriculum of the program is divided into three broad areas: Software Engineering, Fundamentals, and Systems. Software Engineering, including the study of computer languages and compilers, has 24 required credit hours of material. Fundamentals, which includes mathematics, writing, and theoretical computing, has 18 required credits. Systems has 15 required credits, and in addition to traditional systems areas it will include a strong emphasis on the emerging field of distributed embedded systems. In addition, students must complete a 9-credit specialization in 3rd- and 4th- year courses. Students must also meet the university's breadth (WQB) requirements, which will require approximately 18 credits outside of the other program requirements, leaving approximately 36 credits of completely free electives. This elective count allows for students to easily combine Software Systems with minors or concentrations in other disciplines. The curriculum has been designed in close accordance with Software Engineering standards established by the major professional computing and engineering bodies (ACM and IEEE).

Delivery methods

It will be delivered with a combination of lecture and laboratory work, with ample project- and case- based pedagogy to appeal to the learning style of the target audience.

Linkages between the learning outcomes and the curriculum design, including an indication whether a work experience/work place term is required for degree completion

The program and curriculum have been designed without a required internship or workplace experience. However, given the strong demand and projections in the software industry, it is anticipated that any student wanting an internship will have one available to them. Currently, our co-op department has more computing science internships available than we have qualified students to fill them.

Distinctive characteristics

We anticipate that this program will see significant demand from students who prefer the pedagogical approach taken by this program, in contrast to our existing major. We also hope to attract students who have a greater interest in software development and software engineering than can be met by our existing major.

Anticipated completion time in years or semesters

The program is designed to be completed in 8 semesters of full-time study.

Enrolment plan for the length of the program

Our target student intake is 30-50 students per year.

Policies on student evaluation

Students will be evaluated on homework, projects, class participation, and examinations, in accordance with the current practices in the School of Computing Science and Simon Fraser University.

Policies on faculty appointments (minimum qualifications)

Courses will be taught by a combination of tenured and tenure-track faculty (Ph.D. required) and lecturers (M.Sc. required), with occasional use of sessional instructors. Normal qualifications for a sessional instructor are an M.Sc., although, given the applied nature of this program, we will also seek out candidates who have significant experience in the software industry.

Program Resources

When the Software Systems program commences, the School plans to phase out the (currently minimal) offering of the Computing Science major at the Surrey campus. This means that the faculty of the Surrey branch of the School (6 tenured/tenure-track and 3 lecturers) will be mainly teaching in the Software Systems program. (The remainder of their teaching—approximately 1/3 of it— will be graduate teaching and service teaching in support of other majors and joint programs.) Most of the teaching requirements for the program can be met by augmenting the current Surrey faculty by two tenure-track appointments, one each to increase the pool of expertise in Systems and in Software Engineering. The remainder of the teaching can be covered by diverting teaching resources (instructors) from the School's Burnaby campus operations to the Surrey campus. The faculty currently at the Surrey branch of the School, with qualifications, rank, and area, are:

Dirk Beyer, Ph.D., Assistant Professor, Software Engineering
Robert Cameron, Ph.D, Professor, Software Engineering Languages
Toby Donaldson, Ph.D., Lecturer, Artificial Intelligence
John Edgar, M.Sc., Algorithm Animation
Mohamed Hefeeda, Ph.D, Assistant Professor, Computer Networks
Harinder Khangura, M.Sc., Social Impact of Computers
Thomas Shermer, Ph.D., Professor, Algorithms
Tamara Smyth, Ph.D, Assistant Professor, Digital Signal Processing
Kay Wiese, Ph.D, Associate Professor, Bioinformatics

Policies on program assessment

Internally, the program will be closely monitored, assessed, and adjusted each year during the first several years. The program will also be subject to an external review

every 7 years, in accordance with University policy. In addition, the School will keep in contact and consult with industry individuals and groups to monitor the suitability of the Software Systems graduates to the rapidly-evolving software industry.

Level of support and recognition from other post-secondary institutions, (including plans for admissions and transfer within the British Columbia post-secondary education system) and relevant regulatory or professional bodies, where applicable

Software Systems was not explicitly designed as a program suitable for professional certification. We are, however, exploring various accreditation options more broadly in the School of Computing Science.

The program was designed to allow students to easily transfer between the Computing Science and Software Systems majors. Thus, many of the required courses in the first and second year of Software Systems are shared with the existing Computing Science major. Since the School of Computing Science already works closely with the Computer Science course articulation committee and has an extensive articulation framework in place with other British Columbia post-secondary institutions, most articulation issues are already resolved.   Transfer admission standards will be set by the School using the process it already uses to set such standards for the Computing Science major.

Evidence of student interest and labour market demand

The graduates from our existing major are currently in high demand in the local, national, and international technology industries. We anticipate that graduates from this program will be similarly successful due to the focus on software development and software engineering.

Related programs in your own or other British Columbia post-secondary institutions.

Currently in British Columbia, university-level Computer Science programs are offered at SFU, UBC, UVic, and UNBC. Additional CS degree programs are offered by the University Colleges, and several colleges offer University-transfer CS courses. UBC offers a certificate in Software Engineering and Quality Assurance; their Electrical and Computer Engineering Department offers a Software Engineering option, as does their Computer Science Department. UVic offers a Bachelor of Software Engineering degree.

For more information, please contact Dr. Thomas Shermer, Associate Director (Surrey) for the School of Computing Science at Simon Fraser University, at (778) 782-7571 or shermer@cs.sfu.ca