UNIVERSITY OF WASHINGTON, TACOMA
COMPUTING AND SOFTWARE SYSTEMS

Proposal for a Minor in Applied Computing
(Version 1.5 – February 12, 2005)

Rationale

UWT students outside the CSS program are, as a practical matter, unable to take our courses. This is due to the difficult prerequisite sequence (142, 143, 320) required to take even our entry-level courses. There is evidence of demand outside the program, both anecdotal, and as evidenced by enrollment in the few service courses we have offered in the recent past. UWT students want some additional exposure to computing, but do not want to take a rigorous programming sequence – nor do their educational goals require it. A significant and growing number of people have exposure to and interest in information systems, but will probably not program them regularly.

On a more practical level, our educational mission should extend beyond our own students, and on an even more practical level we are in a position where overall enrollments at UWT are expected to grow dramatically, and ours are not. We can either find a way to serve the educational needs of the larger UWT community, or risk becoming irrelevant or worse. This proposal is one way of doing so.

We have already moved in the direction of reaching a broader constituency, through service courses we have or will soon offer:

TCSS 307 – Internet Technologies
TCSS 452 – Human/Computer Interfaces
TCSS 490 – Introduction to Computing Systems (Dual Admission)
TCSS 407 – Computing in a Social Context

These are good steps, but

- we lack a framework that will draw students to take courses from us
- our courses go so far in the non-technical direction that they fail to meet the need for "lightly technical" classes that students need to complement their major disciplines (e.g. GIS, ES, Business/IS)
- without some sort of official framework or other incentive to take the class(es) (like a transcript notation), we will have trouble attracting students to them.

Finally, there is a tremendous amount of enthusiasm campus wide to develop cross-program educational offerings, and establishing a vital set of minors is a good way to help with that. We can take the lead in that mission.

It should be noted that there already is a CSS minor available, which requires 143, 342, 343, 360, and two additional CSS courses. This proposal would not replace that minor, which would continue as a more "programming-oriented" option.

Basic Structure and Mission

UWT minors typically consist of 25 to 35 credits, in a combination of foundation courses (2 or 3) and electives (2 or 3) that are typically selected from the program's regular offerings. In most cases our electives will not be suitable for non-majors, but a few (452, 407) would benefit both majors and non-majors.

The educational goal of the minor is typically to provide the student with a little depth and a little breadth. In the case of computer science, the depth would a better understanding of the technology (computer organization and programming, networks and communication, data management). The breadth would provide educational experiences that span the area between computing and the student's major discipline (452, 407). Computing-related courses in other programs would be relevant here, as would independent study or capstone courses.

The main challenge in starting the minor will be to offer sufficient flexibility to students, while at the same time not over-burdening our faculty with new courses (and new course preps).

The proposal is:

- the minor consists of five courses, three "depth" courses and two "breadth" courses
- we offer the following (new) "depth" courses
    - computational problem solving and computing fundamentals (TINST310)
    - database management and data analysis (TINST311)
    - computer networks and the Internet (TINST312)
- we offer a portfolio of "breadth" courses that to whatever extent possible are also suitable electives for our majors. These courses might include
    - human/computer interaction
    - computing in a social context
    - media computing (http://coweb.cc.gatech.edu/mediaComp-plan)
    - an informatics course targeted to non-majors
    - information security
    - gaming technologies
    - computing courses in other programs
    - independent study and capstone experiences

To earn the minor the student would complete the three depth courses and two breadth courses, at least one of which would have to be a TCSS course. (This requirement would allow a student to "double count" one course with a computing-related course in another program, but not two.)

SUMMARY	
Depth	**Breadth**
Problem solving and fundamental (310; 5 CR)	One CSS breadth course (5 CR) AND
Database mgt and data analysis (311; 5CR)	Second CSS breadth course OR
Computer networks and the Internet (312; 5 CR)	Independent study OR
	Computing course in other program

Fluency and Programming Courses

The course TINST 310 has been approved by the faculty for Autumn 2005 with the following course description:

- This course covers the fundamental framework for developing computational solutions to a variety of problems encountered in the world. Computational problems are everywhere and modern life could not go on without means to routinely solve these kinds of problems. The course first develops the concept of a computational problem; not all problems are solved computationally. However, many real-world problems are amenable to computational solutions. This course then explores the methods of analyzing and characterizing problems, and the methods by which a computational solution can be developed. Computer programming, as a method for specifying and implementing a solution, is introduced, but is not the central feature of this course. Various types of programming are explored and compared. The mechanisms used to implement computation are introduced in order to understand how computers work and how the software interacts with the hardware to produce a result.

Database Management and Data Analysis

The course TINST 311 has been approved by the faculty for Autumn 2005 with the following course description:

- Databases provide powerful systems and methods for transforming data into valuable information. Professionals from any discipline, from arts and sciences to business alike, benefit from learning how to manage information in databases, whether for their independent practice or within a company. Students learn in this course how to transform data into information through a database management system, how to query it interactively, how to visualize it in a meaningful way, how to share it on the Internet, and how to analyze it. The approach is practical, based on solving concrete problems the students are interested in, with hands-on labs and tutorials on a multimedia database management system.

Computer Networks and the Internet

The course TINST 312 has been approved by the faculty for Autumn 2005 with the following course description:

- Computational networking is fundamental to comprehend how computers and people communicate over the Internet. The course studies how the Internet and the World Wide Web have changed how people, businesses, and communities work and interact. It presents a variety of Web development technologies for developing state-of-the-art dynamic Web sites.

It follows a practical approach through hands-on labs and homework proposing to solve concrete Web development problems of interest to the student in a wide range of application areas.

Scheduling

We need to address the question of what courses will be taught which quarters. Of course this will depend on enrollment, for the short term I suggest the following plan.

For the next academic year try to run the minor as a cohort. That is, offer the three "depth" courses in sequence, Autumn, Winter, Spring. We would offer at least one breadth course in Winter and Spring the first year, and all three quarters in subsequent years. If enrollment permitted, we would offer the Fluency course a second time, in the Spring to allow better access to the breadth and other depth courses. We can probably get away with not offering any new breadth courses (unless we want to), if we re-offer both the HCI course and the social computing course, we identify courses in other programs that would qualify as breadth courses, and we remain open to the idea of sponsoring cross-program independent study courses.

TENTATIVE COURSE SCHEDULE			
	Autumn	Winter	Spring
Year 1	Fluency	Data Mgt. CSS Breadth	Networks CSS Breadth
Year 2	Fluency Breadth	Data Mgt CSS Breadth	Fluency Networks CSS Breadth

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Issues and Plans

The main issue we will need to confront prior to implementing this minor is anticipated enrollment: it is hard to anticipate how many students we would expect to see in these courses. Since we are proposing the minor in conjunction with a BA degree for which our students will be taking minors outside the program, in return we can expect other programs to promote our minor to their students. Initially we will want to enter into close relationships with likely partners (Business, GIS, Environmental Science), but our ultimate goal should be to transform the campus culture into one where cross-program enrollments are the norm rather an anomaly.

Revision History

Hanks – initial draft 1.0 of 11/11/2004)

Hanks – draft 1.1 of 11/16/2004

Hanks – version 1.2 of 11/29/2004

Reflects version approved by faculty

Hanks – version 1.3 of 12/02/2004

Cosmetic changes only

Hanks – version 1.4 of 1/24/2005

Updated, and eliminate some personal opinions and notes that were for internal consumption only. This version is intended for external distribution.

Hanks – version 1.5 of 2/12/2005

Replaced tentative course descriptions with the real ones, and changed course numbers