



March 9, 2010

Dr. Tracy Pellet  
Associate Vice President for Undergraduate Studies  
Central Washington University  
400 East University Way  
Ellensburg, WA 98926-7503

Dear Dr. Pellett,

Enclosed is my review report of the Computer Science Department at Central Washington University. The review is based upon the department self-study materials provided to me, and interviews conducted with administrators, faculty, staff and students during my two day visit in February. I would like to express my pleasure in conducting this review due to the hospitality and genuine interests in the educational mission of the department of everyone involved. Having done a number of department reviews over the years, this review process and materials were very well organized and managed.

If you have any questions please do not hesitate to contact me.

Sincerely,

Robert Bryant

Professor, Gonzaga University

To: Dr. Tracy Pellet, Associate Vice President for Undergraduate Studies  
From: Robert Bryant, Professor of Computer Science, Gonzaga University  
Date: March 9, 2010  
RE: CWU Computer Science Department Review Report

The computer science department at Central Washington University has a uniquely strong and dedicated faculty. The quantity of grant proposals and research publications is exceptional for a regional teaching oriented program. It is clear the faculty members work well together. The curriculum for the CS program is well organized and appears to serve the students well. The level of student involvement in the SOURCE program and the major field test performance is commendable. Due to the difficult budget climate presently in the state, the department has had to make some cut backs that affect the course offerings to students. In spite of these changes, the CS program still offers a solid foundation of the computer science field.

The following sections contain reviews of the various areas of the program along with recommendations of the most pressing needs gathered from the program review materials supplied and the interviews conducted during the two day campus visit in February, 2010.

**Faculty:**

The five full time tenure track faculty display solid evidence of active research and/or teaching interests. With long time members Dr. Schwing, Dr. Gellenbeck, and Dr. Kovalerchuk, the department has created a beneficial mixed of teaching and research. Newer faculty members, Dr. Andonie and the recent addition of Dr. Modave, have added an energetic influence that seems to complement the program well. As discussed later in this report, the faculty are striving to enhance the program while maintaining a quality level of teaching. Since the faculty is mature, it will face some transition issues in the next few years as the longer term members phase into retirement. This transition period is an area of concern as it may well happen before the next program review, and administrative support for maintaining quality during the transition will be imperative. I see no present significant deficiencies in the quality of the program.

**Areas of concern:**

- 1) Due to the recent cut backs in adjuncts, faculty have lost the ability to devote some scheduled time to research development. If this continues, the loss of motivation for doing research beyond the teaching load may negatively impact faculty research. It is essential the administration provide the reward structure to maintain research goals. This is particularly

critical to a department such as CS which will need the younger faculty to carry the department forward as a large number of its current members retire in the next few years.

### **Curriculum:**

The CWU CS curriculum is guided by the ACM curriculum, a model widely used within the field. The department follows an annual review of courses on a rotating basis. This is an excellent monitoring process that maintains the relevance and quality of the content in the courses of the program. Again, due to budget constraints, the curriculum changes resulting in less frequent offerings of elective courses has resulted in negative impacts on student scheduling. Although, adjunct funding may be beyond the department control, students expressed frustration with missed course opportunities. This may be alleviated with more communication efforts during the advising process.

The department offers two courses, CS 101 and CS 105, which students may take to fulfill parts of the general education requirements of the university. Both of these courses are designed to address the goal of the general education components using a focus that is relevant and appropriate coming from the computer science perspective. In particular, the 101 course seeks to have students learn more than information technology literacy skills by focusing on fluency involving skills, concepts, and capabilities. This is in line with recommendations by the national research council report on Being Fluent with Information Technology. The 105 course which fulfills the reasoning aspect of the general education requirement contains a problem solving focus with an integral computing component. This is a valid approach to exposing students to the computational thinking aspect needed in many of society's problem solutions.

The senior capstone course has student teams develop primarily university community generated software engineering projects. While these projects are selected for their appropriateness by the faculty, it may be beneficial to explore having industry sponsored projects. The real world experience gained by the students would help to address one of the higher priority program enhancements students indicated they desired. Additionally, industry sponsored projects may provide a potential revenue source through donations to help the CS program, as is done in other similar CS programs.

### **Areas of concern:**

- 1) The CS program has a one of the lighter mathematics requirements for a CS degree. Recognizing the lacking mathematics preparation of the incoming students, the department has set the math requirements accordingly. However, this does pose problems for topic coverage in some of the courses that traditionally rely upon backgrounds in areas such as statistics, graph theory, and linear algebra to name a few. Based upon previous program review reports, there has been discussion of adding an additional math course to the

degree requirements. Although the faculty presently overcomes this gap in students' math background on an as-needed-basis, it is recommended an additional math course be added to the requirements. This will be of more importance if the hope is to have the undergraduate CS program at CWU be a feeder for the proposed new graduate program.

- 2) The present CS curriculum utilizes almost entirely the windows operating system. In today's web influenced computing environment, it would be beneficial to expose students to a more structured unix/linux experience. At the very least give them experience with a unix/linux web server either via the web programming course sequence or the operating system related courses.

#### **Facilities:**

The teaching classrooms, faculty offices, research labs, and general computer labs provide excellent environments for the size of the faculty and student population. The computer equipment is well maintained and upgraded on a reasonable timeline. Faculty and students indicate the resource materials via the library are adequate, although access to computer science related journals in the ACM digital library via the CWU library has not been known to be available by the department until recently.

#### **Areas of Concern:**

- 1) The most glaring item regarding facilities is the continued lack of air conditioning in the faculty offices. This issue has been a requested need for years. The AC has even been approved in the past, and yet it is still not installed. At this point, this has become an insulting issue that has created unnecessary animosity. If the university expects the CS faculty to continue year-round teaching and research, it should provide a modern environment enjoyed by other faculty and administrators in the same building. **Install the air conditioning.**
- 2) Two of the teaching computer labs do not have overhead media projectors installed. Although the department has access to portable projectors, it would benefit via increased instruction time by installing projector systems as found in the other lab.
- 3) A frustration raised by the students was the 10 pm closing times of the labs, in particular room 218. As at most college campuses, many students are studying long past midnight. A suggested possible solution worth investigating may be installing a card/code key lock so students could access the lab 24/7.

#### **Proposed Masters in Computational Science:**

The proposed masters in computational science is a bold initiative that has the potential to add a program that could harness the synergy of CWU science faculty. Computational science is a rapidly expanding field and becoming a more critical component of solutions to today's problems. I believe developing such a program from faculty within the university is a relatively low risk strategy in getting the program up and running.

Areas of Concern:

Three recommendations that I believe would help getting such a program approved:

- 1) Conduct a more formal market research study. The anecdotal evidence of program interest gained from current computer science students would not be a valid indicator since it is likely few of the current students would have the necessary mathematical background.
- 2) Dr. Modave and others have made some industry contacts in the Seattle area that have shown interest in a computational science program. These contacts should be leveraged and expanded to help establish the program.
- 3) With the recent cut backs in adjuncts, adding a new graduate program will undoubtedly increase the workload on all faculty in the program. Care must be taken to offset an increase in workload through additional adjunct support as needed. As noted in my comments under the systems engineer position, an additional systems person would be necessary to adequately support a new masters program.

#### **Support Staff:**

The department secretary, Charlene Andrews, who is in her first year, is energetic and is working along with faculty to get the students more involved in department activities and career planning. Her efforts to work with the career services program at CWU to help students obtain career preparation skills should help address a criticism expressed by students about the career resources available.

Fred Stanley the systems engineer is doing a large task in managing the computer systems under the departments domain. The number of systems he manages has increased significantly during his tenure.

Areas of concern:

- 1) As Fred Stanley nears retirement relatively soon, it will be difficult to replace him with one person as his job responsibilities have grown significantly since they were established originally. The hardware is managed well but many individuals expressed concern about the

lack of software maintenance. This will need to be addressed via an additional systems administration position, particularly if a new masters program is implemented.

**Miscellaneous:**

- 1) It would be helpful to both the current program and a new masters program if a more formal alumni survey/outreach program was begun.
- 2) There have been efforts over the years by various faculty members to do high school outreach projects in hopes of increasing enrollment in computer science. This has been a national problem and a significant amount of funding has been directed towards addressing this problem. To date, there has been no universal solution. I do not think focusing more CWU CS faculty resources on this will yield significant results.
- 3) Sabbatical coverage has been covered in recent years through the availability of quality local adjuncts with whom the department has developed and established relationships. Now with the loss of many of these adjuncts, there is a genuine concern that covering sabbaticals will be more difficult. This, of course, will also have an impact on the success of a masters program.