

AURORA UNIVERSITY

CSC ACADEMIC PROGRAM REVIEW  
PREPARED BY DAVID A. LASH

JULY 1, 2021

Executive Summary

One page Executive Summary (written last)

Introduction

Aurora University periodically reviews its academic programs to confirm that they support its mission as “an inclusive community dedicated to the transformative power of learning…[that encourages] undergraduate and graduate students to discover what it takes to build meaningful and examined lives…[and that empowers them] to achieve lasting personal and professional success.” The University has established three goals of program review:

1. To evaluate program quality

2. To identify opportunities for program development

3. To reflect on a program’s growth and its place within the university community

It is within this context that this document reviews the state of the university’s undergraduate political science and public policy (hereafter PSC) program. Particular attention is paid to how curricular changes instituted during the 2017 – 2018 academic year affected the program’s historical structure and learning outcomes, its alignment with the university’s mission and objectives, and the quality of its course offerings. When appropriate, the information contained in this review is drawn verbatim from prior years’ assessment reports and plans. To further aid in the review process, the program is compared to similar programs offered at North Central College, St Xavier University, and St Francis University.

Procedures Performed

The following procedures were implemented to perform this evaluation:

1. Research into the evolution of the CSC program over the past decade.
2. Informal appraisal of program resources and structure, course offerings, and instructional quality via conversations with key stakeholders, including students, faculty, library representatives, and the Dean of the Dunham School of Business and Public Policy.
3. Assessment of Smart Evals and other student feedback periodically gathered by faculty.
4. Review of three prior assessment reports, as well as feedback provided by the university assessment committee.
5. Evaluation of enrollment trends provided by University Analytics.
6. Consideration of career outcome data compiled by the Bureau of Labor Statistics.

Comparison with similar programs offered at North Central College, St Xavier University, and St Francis University.

# Areas of Focus/Findings

# *The Program Review Materials File will be compiled and referenced to complete this section of the Academic Program Review Report. Essential components are listed in the Appendix of the Guidelines.*

1. Program Description

As described in the university catalog, the Aurora University Computer Science program   
“includes computer architecture, software engineering, database systems, algorithm design and analysis, multiple language study, and web development. *“*

The program is intended

“to provide students experience with current technologies in order to prepare them for the changing expectations of employers, or as strong preparation for graduate study in computer science. “

*Program Changes*

Over the past 10 years the CSC program has had the following significant changes:

1. ***Growth -*** In that 10 years, the CSC program has seen a rapid rate of growth. For example, during the F2010 Aurora University offered 4 CSC courses. During F2020, we offered 13. The course offering delta aligns with enrollment data that show ***a 47% growth rate from F2015-F2020 with an average*** ***8.6% growth rate*** See table 1 below:

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **Table 1: Majors at fall audit date, Fall 2015-Fall 2020** | | | | | | |
| Includes all active majors on student's record on the audit file date. | | | | | | |
|  | **15/FA** | **16/FA** | **17/FA** | **18/FA** | **19/FA** | **20/FA** |
| Computer Science, BS | 77 | 91 | 109 | 106 | 98 | 113 |
| **Overall** |  | FA 15-16 | FA 16-17 | FA 17-28 | FA 18-19 | FA 19-20 |
| **8.6%** |  | 18.3% | 19.8% | -2.8% | -7.5% | 15.3% |

1. ***Software Engineering Major -*** During F2018 a Software Engineering major was launched that included 3-4 additional CSC courses and two separate job searches for faculty. In both cases, the selected candidate accepted AU’s offer to later recant at the last minute (causing a series of last minute overload assignments.)
2. ***Faculty Load -*** The rapid growth and hiring issues results in CSC faculty frequently teaching overload schedules and sometimes teaching 5 courses. We currently have 1 faculty full time staff, 1 as visiting Professor with a series of 1 year contacts and about .5 a Professor from the Mathematics Department.
3. ***Curriculum Stress and Student Jobs*** – The AU CSC program requires significantly fewer course than most similar programs. During F2019, 1 course was eliminated and the course hours increase from 3 credits to 4. The AU CSC curriculum now requires 8 required courses and 2 electives. Most CSC programs require ~14 courses (or about 30% fewer courses) with a 3 elective course system While this allows some students to graduate early, graduating students have a competitive disadvantage with less diverse knowledge and project experience in the highly competitive tech field.
4. ***Curriculum Change -*** Several curriculum changes were adopted during F2019-S2020, that fixed course descriptions, refined prerequisites, and dropped 1-2 electives. In addition to the added Software Engineering courses, 2-3 more electives we included such a Mobile Development and Programming Languages.
5. ***Faculty and Leadership Change –***  In the last 6 years, the CSC lost 1 full time faculty and added one. A second faculty member has been with AU the entire time. During that time, the department was led by 5 different department heads with 5 different educational backgrounds. This frequent leadership change has hampered the department’s ability to plan and continually improve.

*Demographic Data*

University provided demographic data shows the following trends

1. ***Gender Gap*** - Over the last 5 years on average 15.7% of the CSC majors are women. This percentage of women CSC majors has been very consistent over the last 5 years . (See Figure 1.) According to an article cited by Wikipedia (Wikipedia.com, 2021), the national average of Women CSC majors is 18%. The most current year (2020) seems to be on track with the national averages.

Figure -Percent CSC Majors Identifying Themselves as Female Per Year

1. ***Racial Data -*** During the last 5 years, the percentage of hispanic CSC majors have increased 122% (2015:22, 2020:49) At that same, time the percentage of students identifying themselves as white has remained constant (2015: 38, 2020:38). The percent CSC Black majors has fallen dramatically from a high of 16 to cuurnely only 4. In particular, something appears to have shifted from F2018-F2019. During that time, the incoming white dropped by 27% and black by 50% while hispanic majors increased 26%. From F2019-F2020 the incoming White population seems to have recovered (8.5% growth). However, the incoming Black population dropped to its lowest level (4) in the last 5 years.

Figure - Incoming CSC Majors Identification by Race

1. *Age ­Data –* During the last 5 years, the CSC program seems to be attracting more students in the 16-22 age category. The 16-22 age group increased 63% from 2015-2020 compared to the programs 46% growth rate during that time.

Figure - Incoming CSC Majors By Age

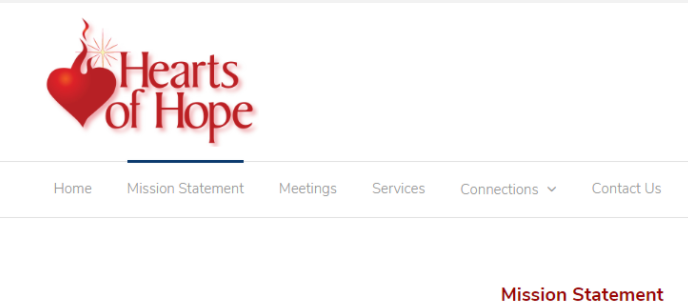
1. *Alignment with University Mission, Strategic Goals, and Objectives*

As noted in the Introduction, the University commits itself to encouraging students to “the transformative power of learning.” In addition, the University works to “empower our students to achieve lasting personal and professional success.” AU has core values of Excellence, Integrity, Citizenship and Continuous learning.

The CSC program aligns itself with these missions and goals in a number of ways.

1. ***Excellence –*** As an engineering based program, the program requires student to complete studies in calculus, discrete mathematics and course work in Data Structures, Software Engineering and Databases. These are not easy courses and require significant efforts of student time to learn and study*.* In addition, in courses such as Data Structures, Software Engineering and Capstone, students learn about and prepare for the high bar the tech industry places on new hires. They learn the value of honing their craft by practicing technical interviewing problems and technical interview questions test their abilities to build systems and software.
2. ***Integrity –*** All CSC students take part in learning, discussion and in an in-depth writing initiative on Engineering ethics. During this time, they learn about the Software Engineering ethical Code, ethical frameworks for decisions and analyze through a major paper specific ethical dilemmas in Engineering.
3. ***Citizenship*** – Over the last 3 years, the AU CSC program has worked with a variety of non-for-profit and local projects. For example, we completed software that created a volunteer tracking system for the Aurora Food Pantry, a web site for “Hearts of Hope” non-for-profit counseling (see Figure 3 below), an ID checker for the Kane County Court Houses, a video project for the Kane County Animal Shelter, and a GPA Calculator for the Aurora University.

Figure 3- Hearts of Hope Home Page Created by AU CSC Students



1. ***Continuous Learning*** – The AU value is also a core value of the AU CSC program. In almost every class, students learn about the quick pace of technology and the need to become continuous, self-directed learners. For example, in Web Application Development students learn how quickly web technologies and standards have changed in the last 4 years. They learn how quickly syntax, technology becomes deprecated and the need to continuously learn the leading edge of technology. In data structures, students are required to learn about and practice problems from sites that provide technical problems designed to hone their skills. In Capstone, students are required to practice self-directed learning by selecting a new technology (with instructor approval) and learning and incorporating it into projects.
2. Quality of instruction - What do the reports suggest about the quality of instruction and how the quality has changed over time? What do the reports suggest about actions that could be taken to improve instructional quality?

Table 2 compares average Smart Evaluation ratings earned in CSC courses between Fall 2016 and Fall 2020 to averages earned in all Arts and Sciences courses. As shown in this table, CSC courses rated less favorably than Arts and Sciences courses did generally on average by 4.5%. Comparisons by year are not appreciably different from the aggregate scores reported here and are therefore not displayed separately.

Table 2. Smart Evaluation Comparison (Fall 2016 – Fall 2020)

|  |  |  |  |
| --- | --- | --- | --- |
|  | CSC Courses | Arts and Sciences | Percent Different |
| On Time and Prepared | 4.4 | 4.5 | -2.2% |
| Communicates Clearly | 3.9 | 4.2 | -7.1% |
| Uses a Variety of Teaching Techniques | 3.8 | 4.1 | -7.3% |
| Actively Engage My Learning | 3.8 | 4.1 | -7.3% |
| Aware of Instructor’s Performance Expectations | 3.8 | 4.1 | -4.5% |
| Demonstrates Mastery | 4.3 | 4.5 | -4.4% |
| Recommend This Course | 0.8 | 0.8 | 0% |

It is difficult to assess why CSC courses score less than the overall LA&S courses. One reason might that they require significantly more time for students (about 15% more time overall (2.2 vs 1.9 hours/week). Another reason might be the nature of rapidly changing field. Technology instruction must continually evolve to new technologies and techniques as the field rapidly changes. Yet another reason might be difference between individual professors and the many adjuncts we employ. Still another rationale might be how adaptable the CSC faculty must be with our limited resources. For example, in 3 years as a full time faculty at AU, I have taught every class in the required curriculum plus 3 different electives, developed 2 new courses from scratch and completely rewrote CSC1700 to change its core technology. It would be instructive to investigate these the impact of these areas on the quality of instructor in more depth.

If we look at the 3 full-time professors with more than 9 or more courses taught during the period, we see large variation in the quality of instruction.

Table 3. Smart Evaluation Results By Full-Time Professor (with >= 9 CSC courses)

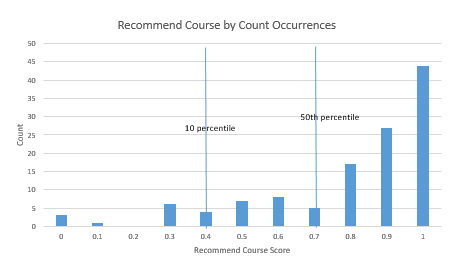
|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
|  | All CSC Courses | Arts and Sciences | P1 | P2 | P3 | P4 |
| On Time and Prepared | 4.4 | 4.5 | 4.7 | 4.6 | 4.0 | 4.8 |
| Communicates Clearly | 3.9 | 4.2 | 5.2 | 4.4 | 2.9 | 4.5 |
| Uses a Variety of Teaching Techniques | 3.8 | 4.1 | 5.2 | 4.1 | 3.0 | 4.5 |
| Actively Engage My Learning | 3.8 | 4.1 | 5 | 4.0 | 3.1 | 4.4 |
| Aware of Instructor’s Performance Expectations | 3.8 | 4.1 | 5.2 | 4.5 | 3.6 | 4.6 |
| Demonstrates Mastery | 4.3 | 4.5 | 4.7 | 4.7 | 3.6 | 4.8 |
| Recommend This Course | 0.8 | 0.8 | .9 | .9 | .6 | .9 |
| Total Courses | 122 |  | 35 | 27 | 33 | 9 |

Within the CSC about 17% of the courses have been taught be Adjunct Professors. When comparing the adjuncts with the full-time faculty students report a significant different in instruction quality (See table 4)

Table 4 Smart Evaluation Results for All Adjunct Professors VS all Full Time

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | All CSC Courses | Arts and Sciences | Adjunct | Full Time |
| On Time and Prepared | 4.4 | 4.5 | 3.8 | 4.5 |
| Communicates Clearly | 3.9 | 4.2 | 3.3 | 4.25 |
| Uses a Variety of Teaching Techniques | 3.8 | 4.1 | 3.1 | 4.2 |
| Actively Engage My Learning | 3.8 | 4.1 | 3.2 | 4.3 |
| Aware of Instructor’s Performance Expectations | 3.8 | 4.1 | 3.6 | 4.5 |
| Demonstrates Mastery | 4.3 | 4.5 | 3.3 | 4.7 |
| Recommend This Course | 0.8 | 0.8 | .6 | .8 |
| Total Courses | 122 |  | 20 | 94 |

In order to better analyze the quality of instruction, lets look at only the “Recommend This Course” criterion. Figure x plots the number of occurrence of a “Recommend This Course” score that ranges in value from 0 to 1. Note how the bulk of this data lies above the 50th percentile. Its average value (.8) is dominated by the wide standard deviation in the data (.25). In other words, the lowest 10-15 percentiles of the data drag the overall results down.



If we drill down on the courses listed in the lowest 10 percentiles of “Recommend This Course”, we find 14 courses with ratings of .4 or lower. Table X shows these fourteen courses. If we sort the courses by “Communicates Clearly” these same courses show up with these exceptions. Another section of CSC1700, a section of CSC2400– C++, a section of CSC2650 (Data Structures) occurs with the same set of instructors.

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Course** | **Occurrences** | **Course Type** | **Semesters** | **Comments** |
| CSC1010 – Introduction to CS | 5 | Gen Ed Non CSC Required | S2020, F2019(2x), S2019, S2018 | 2 unique instructors (both adjunct). 1 instructor occurs 4 times. |
| CSC3800 – AI | 3 | CSC Elective | D2016, D2018, F2020 | 1 full time instructor |
| CSC3100 – O/S | 2 | CSC Elective | S2015,S2020 | 1 full time instructor |
| CSC4500 – Database | 2 | CSC Required | F2020 | 1 full time instructor during Covid change, |
| CSCC 3610 – Data Structures | 1 | CSC Required | F2019 | 1 full time instructor |
| CSC4210 Mobile App | 1 | CSC Elective | S2018 | 1 full time instructor added to the course with less than 1week prep time from the Math Department. |

1. Quality of curriculum - What do the reports suggest about the quality of the curriculum and how the quality has changed over time? What do the reports suggest about actions that could be taken to improve quality of the curriculum?
2. Quality of Curriculum

The Introduction to this program review mentions that the PSC major was redesigned during the 2016 – 2017 academic year. As noted, improvement in program quality and rigor, curriculum consolidation, alignment of courses to faculty expertise, and creation of a pathway to the MPA Plus One were among the reasons for the change.

Currently, PSC majors are required to complete ten courses totaling 40 semester hours. Course descriptions and sample syllabi have been posted to Moodle. Ideally, students complete courses as follows:

First Year

PSC1050 Introduction to Public Policy

PSC2160 Economics for Public Policy

PSC2700 Research Methods for Public Policy

Second and Third Years

PSC2550 Political Advocacy

PSC2600 Designing Political Campaigns

PSC3130 Gauging Public Opinion

PSC3410 Pressing the Agenda: Politics of the Media

PSC Issues-Based Policy Course (PSC 3300 Comparative Public Policy, PSC3340 U.S. Domestic Policy, or PSC3380 U.S. Foreign Policy)

Fourth Year

PSC4700 Capstone in Political Science and Public Policy

PSC4830 Political Science and Public Policy Internship

In practice, students often take these courses out of order depending on when they declare the major, whether they have transferred to the university, and when courses are offered. This means that first year students may be enrolled in 3000 level classes, and graduating seniors might be enrolled in a 1000 or 2000 level class.

1. Quality of co-curriculum - What do the reports suggest about the quality of the co-curriculum and how the quality has changed over time? What do the reports suggest about actions that could be taken to improve quality of co-curricular offerings?
2. Assess the evidence supporting extent to which Student Learning Outcomes have been achieved. Has achievement of Student Learning Outcomes changed over time? What do reports suggest about actions that could be taken to improve achievement of Student Learning Outcomes? Do the Student Learning Outcomes remain appropriate for preparation for the career or graduate education aspirations students might have?
3. Quality of program assessment - in what ways could the assessment of the program be improved?
4. How does the program compare on similar dimensions to peer institutions?
5. How does the program compare on similar dimensions to aspirant colleges and universities?
6. Review of what the evidence suggests with regard to development of the program currently in place. What is the demand for graduates and, similarly, are there patterns in student demand for additional or revised programming? Does the environment suggest opportunities for the program to develop additional majors/minors to prepare students to meet emerging needs? Additionally, does the environment suggest the need to modify or eliminate any of the current programmatic emphases?

*\*\*\*Additional questions pertaining to the program under review may be offered by the program chair, Jurisdictional Dean, Dean of Academic Administration, or Chief Academic Officer.*

Analysis

The analysis section can be structured as a SOAR (strengths, opportunities, actions, and results) analysis. Each section should refer to specific evidence from observations and reflections of the reviewers to support the conclusions drawn.

Recommendations and Strategy

The program will develop 2-4 strategic goals, supported by 3-5 tactical objectives each. The goals must include at least one addressing the short term (1-3 years) and one addressing the long term (3-5 years).

The goals should be based on evidence and analysis, for development of curriculum, pedagogy, assessment; student recruitment, development, and retention; recruitment and development of faculty and staff members; facilities; partnership with entities external to the university; potential development of new initiatives and programs; and enhancing alignment with programs at aspirant institutions.