ACADEMIC PROGRAM REVIEW
Fairmont State Board of Governors

☐ **Program with Special Accreditation** ☒ **Program without Special Accreditation**

Date Submitted December 2, 2022

Degree Program **Bachelor of Science in Computer Science**

INSTITUTIONAL RECOMMENDATION Approved by the Board of Governors (§ 5.2.8)

The institution is obligated to recommend continuance or discontinuance of a program and to provide a brief rationale for its recommendation:

_X_ 1. Continuation of the program at the current level of activity;

_____ 2. Continuation of program with corrective action (for example, reducing the range of optional tracks or merging programs);

_____ 3. Identification of the program for further development (for example, providing additional institutional commitment);

_____ 4. Development of a cooperative program with another institution, or sharing courses, facilities, faculty, and the like;

_____ 5. Discontinuation of the Program

Mahmood Hossain

Signature of person preparing report:

12/02/2022

Date

Signature of Dean

12/8/22

Date

Signature of Provost and Vice President for Academic Affairs:

12/8/2022

Date

Signature of President:

4/20/23

Date

Signature of Chair, Board of Governors:

04-24-2023

Date

Executive Summary for Program Review

Degree Program:	Bachelor of Science in Computer Science
College or School/Department:	College of Science and Technology
Chair/Program Coordinator	Mahmood Hossain
External Reviewer:	Dr. Don Adjeroh Professor, Department of Computer Science and Electrical Engineering, West Virginia University
Reviewer Email:	donald.adjeroh@mail.wvu.edu

A. Synopses of significant findings

The computer science program is one of the top-ranked programs in the College of Science and Technology at Fairmont State University in terms of steady student enrollment, steady graduation rate, student research, collaboration with the local High-Tech industry, and a very successful high-paying job placement record.

We have observed steady growth in enrollment and graduation over the last five years, compared to the previous five years. Based on the internship and job placements of our students/graduates, we can confidently say that our students are well prepared to compete with their peers in workplace. Our curriculum is based on national standards and offers a well-rounded education to our majors.

There are still opportunities for continuous improvement. We understand that we need to improve our assessment process so that we can get our program nationally accredited. We also need to address the student success rates in the lower level programming courses to improve retention.

Overall, we believe the Computer Science program at Fairmont State University is a strong program. We take pride in providing transformational opportunities to our diverse group of students (including non-traditional and disadvantaged students) to prepare them to compete with their peers from other institutions at the highest level. Our program can only improve and continue to be one of the leading ones among the smaller institutions in the state.

B. Plans for program improvement

- Visit at least one area high school each semester, possibly with a graduate of that school and the CS program, to present the strengths of the program and career opportunities.
- Work with University Relations and Marketing to develop a video for advertising purpose, by the end of the 2023-24 academic year.
- Complete a feasibility study to add a Data Science concentration by the end of the 2023-24 academic year, and if it is promising, develop the curriculum by the end of Fall 2024.
- Prepare an initial ABET accreditation self-study report by the end of the 2023-24 academic year.
- Hold a meeting of the program advisory board in 2023 and once every two years.
- Review pedagogical strategies, and modify curriculum if needed, in lower level programming courses (COMP 1120, 1130, 2200, 2270) to improve student success rates to 70% by the end of the 2023-24 academic year.
- Work with Math faculty to explore the possibility of developing a summer bridge program to better prepare incoming first-year students by the end of the 2024-25 academic year.

C. Weaknesses/deficiencies from the previous review

- Improving the retention rates: The plan was to revise the second programming course to create a lab based course. This was done and the success rates in that course has increased. Also, with some changes in lower level programming courses, we have been able to achieve a Fall-to-Fall retention rate of 60% for Freshman cohorts.
- The assessment data for all individual courses: This is where we are still behind. We plan to put maximum effort to get this accomplished soon.
- The employer satisfaction survey: The survey has been sent to employers and data is being collected.
- A graduate satisfaction survey: This has not been done, but we try to keep contacts with our graduates all the time to receive feedback. As an evidence, letters from two recent graduates have been included in Appendix E.
- External accreditation: This has not been done, but we will get a self-study done within two years.

D. Five-year trend data on graduates and majors enrolled

AY	*Enrollment	**Degree Awarded	HEPC Series 10 Productivity Standards Programs are required to meet at least one of the indicators listed below.		
2021-22	107	12			
2020-21	114	15			
2019-20	129	17	Average of Five Most Recent Years		
2018-19	134	12	Degree Level	*Enrollment	**Degree Awarded
2017-18	108	9	Baccalaureate	118	13
5-YR AVG	118	13	Masters		
* Official fall end of term headcount					
** IPEDS Graduation data (July 1 - June 30)					

The following chart shows the yearly enrollment trends for the CS program, the College of SciTech, and the institution over the last five years. Even though the overall enrollment for the institution was declined over this period (6.4%), the enrollment in the CS program held steady.
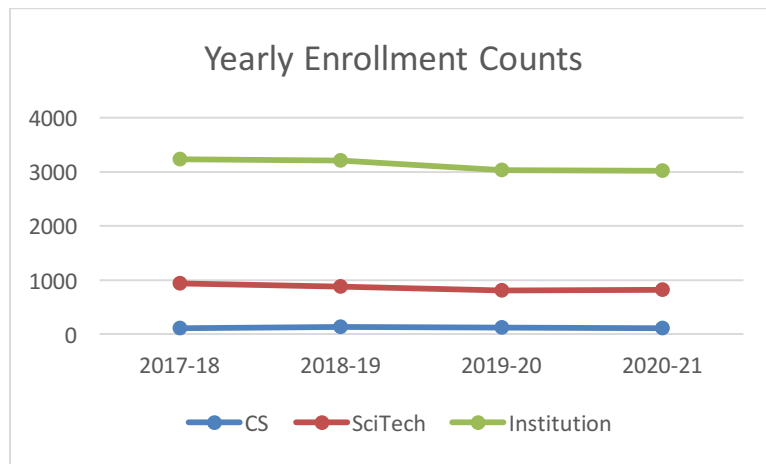
The following chart shows the yearly graduation trends for the CS program, the College of SciTech, and the institution over the last five years.
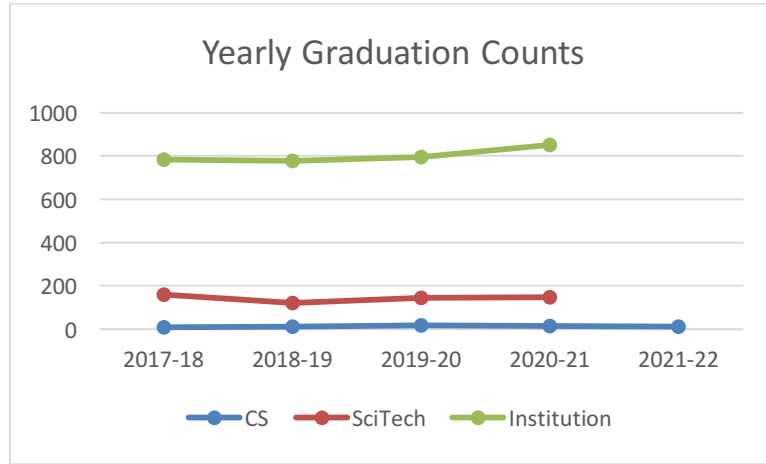
E. Summary of assessment

The assessment methods for the student learning outcomes are based on a wide range of course-based activities; homework, exams, programming projects, group projects, and term papers. The assessment data is collected every year; both for the computer science option and the Cybersecurity option. We have made changes in our introductory programming sequence based on student performance. We converted our first semester C++ programming course into a Java based course. This was done to provide an easier learning environment for first time programming students and also to better prepare students for early internships. We converted our second semester programming course into a lab based one. This has resulted in better student performance in COMP 2270 (Data Structures) which is the gateway course for most upper level courses. This course is also used to assess the first student learning outcome. We started assessing the Cybersecurity concentration in 2018-19. Because of the faculty member responsible for the Cybersecurity concentration leaving the institution at the end of the Spring 2020, we could not assess it for the 2019-20 assessment cycle.

F. Student placement

The number of graduates from the computer science program over the past five years (65) increased from the previous five academic years (39) by 55%. Out of 65 graduates in the past 5 years, we have been able to track 47. Of these graduates, two are currently pursuing graduate degrees, two are still looking for employment in a related industry, and the other 43 are employed in computing related positions. This is a very high placement rate for our graduates.

Most of these graduates have found employment in the computing field, primarily as software engineers. Many of our students were also able to obtain internships during their Junior and/or Senior year. Many of the graduates are currently employed in the local High-Tech companies in the Fairmont, Clarksburg, and Morgantown area. Our recent students/graduates have found internship/employment with NASA, FBI, Northrop Grumman, Leidos, Fusion, Agile5, EWA, and others. The starting salaries for these graduates are attractive and are among the top for Fairmont State graduates.