CSM college of southern maryland
La Plata · Leonardtown · Prince Frederick · Regional Hughesville

January 16, 2020

James D. Fielder, Jr., Ph.D.
Maryland Higher Education Commission
6 N. Liberty Street
Baltimore, MD 21201

Dear Dr. Fielder,

I am forwarding the following new academic program proposal for Commission review:

| Program | HEIGIS | CIP |
|---|---|---|
| Computer Science with Cloud Computing, AS | To be determined by MHEC | 11.0101 |

This proposal presents a new Computer Science with Cloud Computing AS degree. This degree will provide students with the skills and knowledge to begin their careers in cloud computing while preparing them for transfer to 4-year colleges and universities to obtain a bachelor's degree in the field of computer science with a focus on cloud computing.

This submission has been thoroughly reviewed within the college and approved by the Board of Trustees. If further information is required, please feel free to contact by email at edabel@csmd.edu or by phone at 301-934-7846.

Sincerely,

Eileen Abel

Eileen Abel, Ph.D.
Vice-President of Academic Affairs

Office Use Only: PP#

MHEC
Creating a state of achievement

# Cover Sheet for In-State Institutions
## New Program or Substantial Modification to Existing Program

| | |
|---|---|
| Institution Submitting Proposal | College of Southern Maryland |

***Each action below requires a separate proposal and cover sheet.***

- (●) New Academic Program
- ( ) New Area of Concentration
- ( ) New Degree Level Approval
- ( ) New Stand-Alone Certificate
- ( ) Off Campus Program
- ( ) Substantial Change to a Degree Program
- ( ) Substantial Change to an Area of Concentration
- ( ) Substantial Change to a Certificate Program
- ( ) Cooperative Degree Program
- ( ) Offer Program at Regional Higher Education Center

Payment Submitted: (X) Yes ( ) No
Payment Type: ( ) R*STARS (X) Check
Payment Amount: $850.00
Date Submitted: 1/22/2020

| | |
|---|---|
| Department Proposing Program | Business, Technology, and Public Service |
| Degree Level and Degree Type | Associate of Science |
| Title of Proposed Program | Computer Science with Cloud Computing |
| Total Number of Credits | 60 |
| Suggested Codes | HEGIS: To be determined by MHEC; CIP: 11.0101 |
| Program Modality | (●) On-campus ( ) Distance Education (*fully online*) |
| Program Resources | (●) Using Existing Resources ( ) Requiring New Resources |
| Projected Implementation Date | (●) Fall ( ) Spring ( ) Summer Year: 2020 |
| Provide Link to Most Recent Academic Catalog | URL: https://catalog.csmd.edu/ |
| Preferred Contact for this Proposal | Name: Bernice Brezina<br>Title: Prof. & Chair, Business, Technology, & Public Service Division<br>Phone: 301-934-7556<br>Email: bdbrezina@csmd.edu |
| President/Chief Executive | Type Name: Maureen Murphy, Ph.D.<br>Signature: Date: 1/21/2020<br>Date of Approval/Endorsement by Governing Board: 1/16/2020 |

## A. Centrality to Institutional Mission and Planning Priorities:

This proposal presents a new Computer Science with Cloud Computing AS degree. This degree will provide students with the skills and knowledge to begin their careers in cloud computing while preparing them for transfer to 4-year colleges and universities to obtain a bachelor's degree in the field of computer science with a focus on cloud computing.

CSM has a new articulation agreement with St. Mary's College of Maryland with their Computer Science degree. CSM is also in active communications with Morgan State University on developing a transfer agreement to ensure the seamless transfer of credits to these universities. Additionally, other 4-year colleges and universities have recently expressed interest in working with us to develop articulation agreements with this new program.

The Computer Science with Cloud Computing program will utilize existing courses in the Computer Science AS, Information Systems AAS, and Information Services Technology AAS programs. This new program is consistent with CSM's Strategic Priorities, which is to promote student success by providing outstanding education, relevant programming, regional focus, and related support services that help students achieve their goals. The new program will serve to increase graduate satisfaction with job preparation.

CSM is currently in the process of obtaining the AWS Academy institution designation. As such, students and faculty will benefit from the availability of AWS Academy curriculum and discounted rates offered for AWS certification exam testing.

Students graduating from CSM with the Computer Science with Cloud Computing AS degree will have the opportunity to earn in-demand industry certifications, including AWS Certified Cloud Practitioner, CompTIA A+ and CompTIA Security +.

This Computer Science with Cloud Computing AS program will effectively serve a changing student population and emerging workforce. The course selections reflect the changing local workforce needs. The recommendations enclosed are reflections of these elements and are consistent with the College's Vision, "Transforming lives through lifelong learning and service."

The mission statement of the College of Southern Maryland (CSM) inspires the development of close partnerships among the college and its tri-county (Calvert, Charles, and St. Mary's Counties) community stakeholders. The institutional commitment to "enhances lives and strengthens the economic vitality of a diverse and changing region by providing affordable postsecondary education, workforce development, and cultural and personal enrichment opportunities" aligns with the programmatic realities for the Computer Science with Cloud Computing AS degree.

The Computer Science with Cloud Computing AS program is consistent with CSM's Strategic Priorities, which is to promote student success by providing outstanding education, relevant programming, regional focus, and related support services that help students achieve their goals. The new program will serve to increase graduate satisfaction with job preparation and preparation for transfer to 4-year colleges and universities.

This Computer Science with Cloud Computing AS program will "effectively serve a changing student population and emerging workforce." The course selections reflect the changing local

workforce needs. The recommendations enclosed are reflections of these elements and are consistent with the College's Vision, "To transform lives through lifelong learning and service."

This degree will provide a program that will prepare students for in-demand entry level careers in the newly emerging in-demand field of Cloud Computing. The degree will prepare students to transfer to 4-year colleges and universities into Computer Science and Cloud Computing programs. Additionally, this program will provide some flexibility for students who intend to enter the workforce upon graduation with the AS degree by preparing students with some marketable skills and industry CompTIA and AWS certifications upon completion.

This new program does not require any new courses. Therefore, we do not anticipate any additional costs incurred by offering this program, other than the expected costs associated with our anticipated program growth shown in Section L. Additionally, our program will be enriched by support from our Perkins grant funding, which will provide benefits to students such as support for industry certification exam prep and testing.

CSM is committed to supporting this program administratively, financially, and in providing the necessary technical support for this program. Our IT Program Advisory Councils and industry partners, who recruit heavily from our college, have urged us to provide a cloud computing program and to partner with 4-year schools in Maryland to help build the workforce pipeline with talented cloud computing professionals. This includes Naval Air Systems Command (NAVAIR) with offices in Patuxent River, Maryland, comprising a workforce of over 41,000 people. Because of the availability of in-demand, high-paying jobs in computer science and cloud computing, this will be a priority program at CSM. We will support the growth of this in-demand program by dedicating resources including recruiting faculty, supporting professional development, curriculum development, and dedicating resources to our lab facilities and student support services.

Because of our growing local Computer Science and Cloud Computing workforce needs and rapidly evolving threats at home and abroad, we anticipate healthy enrollment numbers for the foreseeable future.

## B. Critical and Compelling Regional or Statewide Need as Identified in the State Plan:

The availability of an in-demand computer science/cloud computing career path in an ever-evolving high technology industry, attracts both traditional and returning adult students, those entering a new field of opportunity as well as workers changing or upgrading skills. These very changes are evident in CSM's own enrollment records. An examination of the demographics of our current student population reflects these realities and supports the needs identified in the current Maryland State Plan for Post-Secondary Education.

The AS degree in Computer Science with Cloud Computing at CSM is consistent with the elements of the 2017-2021 Maryland State Plan for Postsecondary Education. Much of our focus in curriculum development addressed the advisories cited in this document. All the goals were utilized as required criteria but considerable attention was given to the goal of Innovation. "Foster innovation in all aspects of Maryland higher education to improve access and student success." This new program will strengthen economic development and help to support a skilled workforce for the Southern Maryland region.

Citations in the State Plan also address the need for post-secondary institutions to strive for academic excellence and effectiveness. Addressing the goal of Success, "Promote and implement practices and policies that will ensure student success.", the Computer Science with

Cloud Computing program will provide the opportunity for students to complete this hands-on program in Southern Maryland close to their home and obtain the fundamental knowledge, skills, and practice to be prepared for entry-level employment. The very nature of this charge is to develop student-centered learning bolstered by the partnerships with the various employers in our region, including several major military installations. This format increases experiential learning through hands-on job-related activities assuring workplace readiness.

Formative and summative evaluations are an essential value of the educational process at CSM, and are a viable part of the new CSM program. Students are held to standards that are reflective of academic and professional systems, while the structure and operation of the program provides the environment to support the achievement of these standards.

Local employers have expressed interest in a Computer Science with Cloud Computing program and currently provide substantive experiential learning with our IT and Computer Science programs through their recruitment efforts, internship opportunities, and guest speaker events involving our students. These learning opportunities are extremely important as they provide students enrolled at CSM both vital experience and opportunities for networking, and will increase chances of getting a job significantly.

To expand our geographic reach, stimulate enrollment and provide increased access to this improved curricular option, the Computer Science with Cloud Computing program intends to incorporate alternative means of course delivery. The program intends to provide traditional face-to-face courses complimented by offerings that are hybrid or fully online by form. The College of Southern Maryland has demonstrated success in delivering instruction by alternative methods, increasing flexibility and effective use of new technologies. The Division of Distance Learning and Faculty Development (DLF) supports the faculty in developing high quality, accessible and effective teaching and learning environments. To facilitate these goals, the DLF staff provides service to faculty including planning, consulting, training, and support. The DLF staff makes available the resources necessary to incorporate instructional technologies into their traditional or distance learning courses. As such, the DLF staff will contribute significantly to the delivery of all courses in the Computer Science with Cloud Computing program by providing the faculty with the necessary support structures to enhance student success in their delivery, particularly those identified for distance learning, be the methodology fully on line or hybrid.

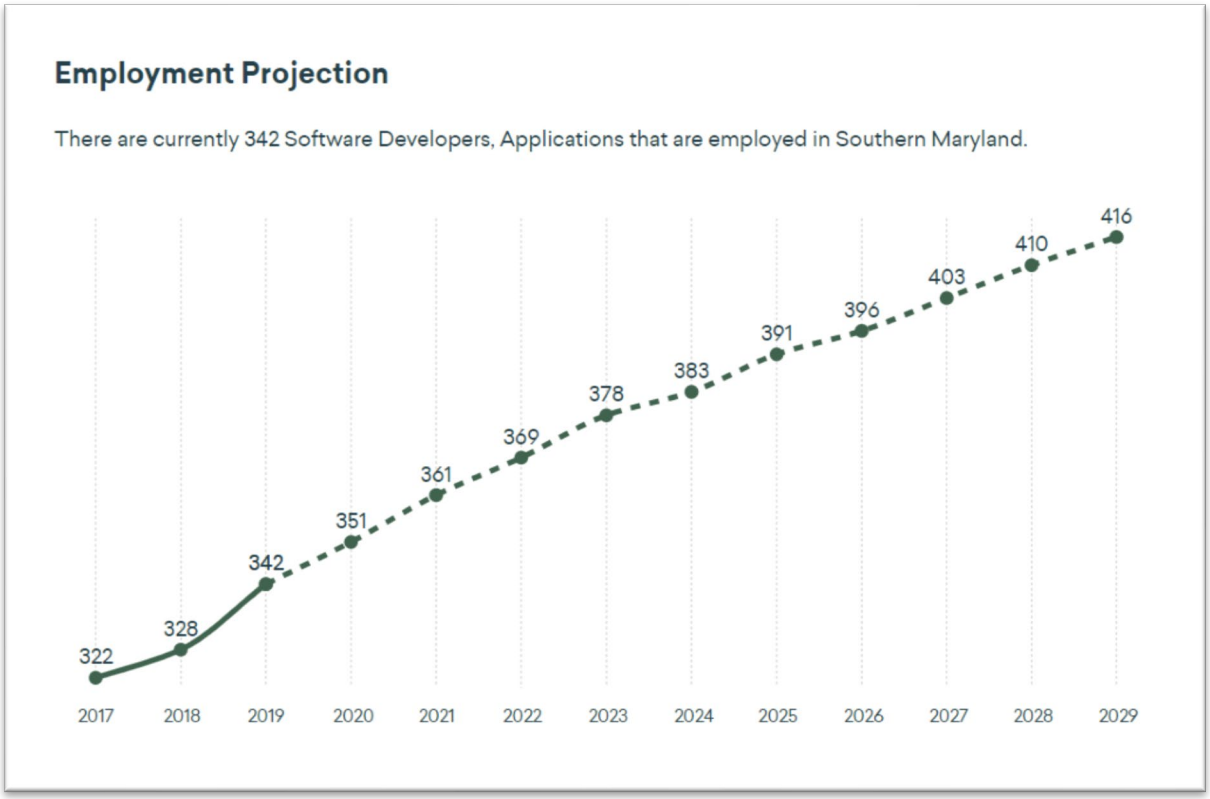
In summary, the Computer Science with Cloud Computing program at the College of Southern Maryland as proposed is consistent with and reflective of the current Maryland State Plan for Postsecondary Education.

## C. Quantifiable and Reliable Evidence and Documentation of Market Supply and Demand in the Region and State:

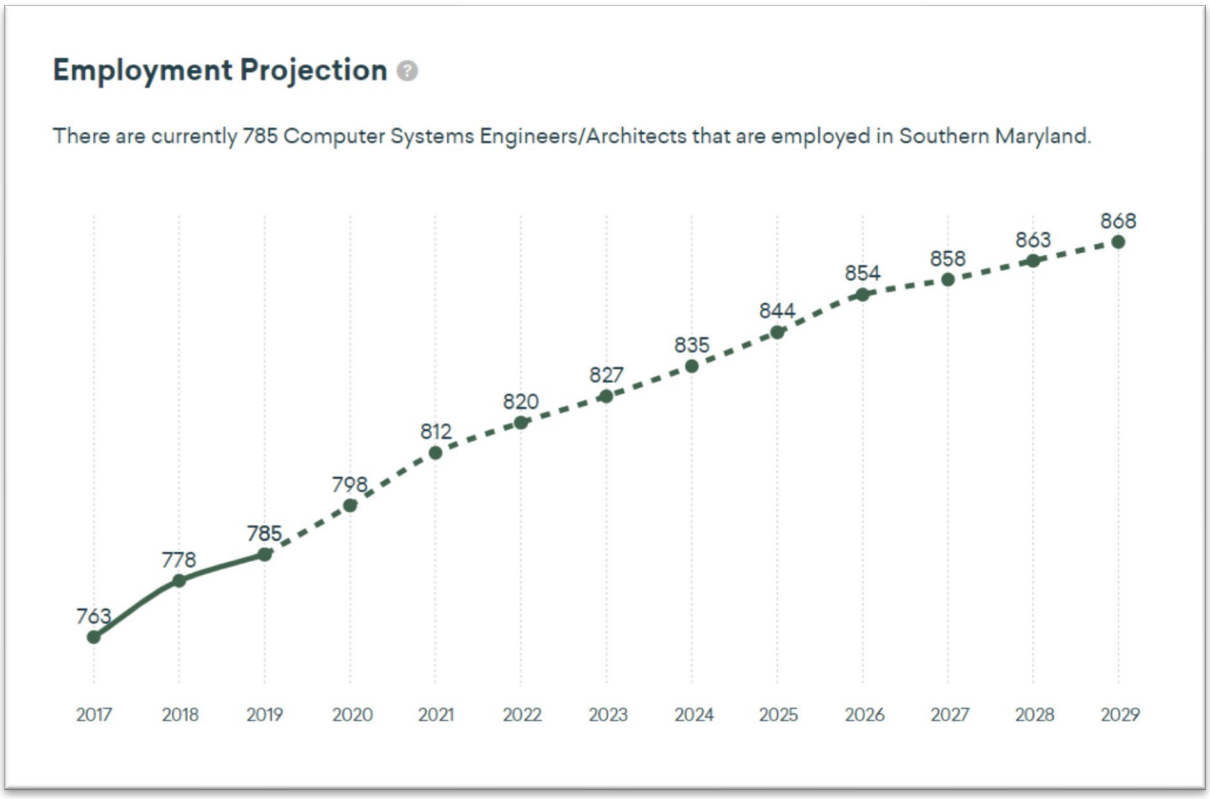
According to a recent jobs report study (2019), "What's Trending in Jobs and Skills", by Boston Consulting Group and Burning Glass Technologies, jobs in cloud computing are growing significantly nationally. Gartner (2019) also projects exponential growth in cloud services and cloud computing technologies.

Locally, the Southern Maryland region is expecting concentrated growth in software developer, computer systems engineers/architects, and cloud-computing related jobs. Much of this is driven by the college's close physical proximity to the Patuxent Navy Base in St. Mary's county which employs over 17,000 military, civilian, and contractors, with many of them in technical positions. Below are representations of expected growth, according to employment project

reports retrieved from EMSI in 2019. With the increased reliance of private industry and government reliance on computer systems, this growth is expected to continue to trend up in the foreseeable future. These new jobs provide opportunities for our students to obtain employment in in-demand fields with high starting salaries (approximately $55-78K, depending on AS or BS degree attainment) and median salaries in the 100K range.




Retrieved from Economic Modeling Specialists (EMSI), 2019




Retrieved from Economic Modeling Specialists (EMSI), 2019

## D. Reasonableness of Program Duplication:

The Computer Science with Cloud Computing AS degree program prepares students who are interested in computer science, cloud computing, programming, software development, and software engineering to begin developing the skills and knowledge required for a variety of entry-level settings. The degree prepares students with a foundation and basis of knowledge and skills that students may develop further if they choose to continue their studies at a four-year institution. Others may choose to enter the workforce in entry-level, trainee, or internship positions after completing the two-year degree.

Students will be taking courses in this program through several course delivery formats. Students have the option of completing some of their courses in this degree online. Many courses are available in face-to-face, web-hybrid, or online course formats.

Below are the other similar programs in Maryland with Associate Degrees in Computer Science with Cloud Computing or related fields:

| INSTITUTION | PROGRAM |
|---|---|
| Allegany College of Maryland | COMPUTER SCIENCE TRANSFER |
| Anne Arundel Community College | COMPUTER SCIENCE TRANSFER |

| | |
|---|---|
| Anne Arundel Community College | COMPUTER SCIENCE, DATABASE MNGT SYSTEMS |
| Cecil College | COMPUTER SCIENCE -PROGRAMMING |
| College of Southern Maryland | COMPUTER SCIENCE |
| Community College of Baltimore County | COMPUTER SCIENCE |
| Frederick Community College | COMPUTER SCIENCE TRANSFER |
| Garrett College | COMPUTER SCIENCE |
| Hagerstown Community College | COMPUTER SCIENCE |
| Harford Community College | COMPUTER SCIENCE TRANSFER |
| Howard Community College | COMPUTER SCIENCE TRANSFER |
| Montgomery College-All Campuses | COMPUTER SCIENCE AND TECHNOLOGIES |
| Prince George's Community College | COMPUTER SCIENCE TRANSFER |
| Washington Adventist University | COMPUTER SCIENCE |
| Cecil College | COMPUTER SCIENCE -PROGRAMMING |

Retrieved from MHEC Academic Program Inventory, 2019

## E. Relevance to High-demand Programs at Historically Black Institutions (HBIs)

There is no impact to the uniqueness, identities and missions of HBIs. The only other college in the tri-county area is St. Mary's College.

## F. Relevance to the identity of Historically Black Institutions (HBIs)

There is no impact to the uniqueness, identities and missions of HBIs. The only other college in the tri-county area is St. Mary's College.

## G. Adequacy of Curriculum Design, Program Modality, and Related Learning Outcomes (as outlined in COMAR 13B.02.03.10):

Our proposed new program in Computer Science with Cloud Computing has evolved out of our existing Computer Science AS, Information Services Technology AAS, and Cybersecurity AAS programs. This new program will be comprised of many courses from our Computer Science AS program with cloud computing and cybersecurity courses borrowed from Information Services Technology AAS and Cybersecurity AAS programs, respectively.

The program will be led by two CSM full-time faculty members, Assistant Professor Richard White and Dr. Eugen Leontie. Assistant Professor White holds an M.S. in Information Technology, Database Administration. Dr. Leontie holds a PhD in Computer Science and is also holds the AWS Certified Cloud Practitioner certification. White has over ten years of recent experience in Computer Science. Dr. Leontie has over 20 years of experience in a vast

array of information technology, computer science, cloud computing, and cybersecurity areas.

Our program faculty is comprised of both full-time and part-time faculty. Our full-time faculty include both new instructors as well as long-time tenured faculty with both academic credentials and industry certifications in their fields of expertise. Our adjunct faculty are current practitioners in computer science, cloud computing, software development, and other IT areas, and they come with a great deal of relevant expertise to enrich their teaching and benefit our students. Many of our adjunct faculty hold industry certifications in addition to academic credentials.

Through the curriculum, professional organizations and engagement activities, graduates of the College of Southern Maryland's Computer Science with Cloud Computing AS program will achieve the following educational objectives:

a. Provide graduates with a common body of knowledge in computer science with cloud computing.

b. Provide graduates with the capability to develop the skills and knowledge required of software developers/engineers in cloud computing settings.

c. Provide graduates the resources and skills allowing them to find employment or enter trainee programs in computer science/cloud computing and related professions.

Through the curriculum, professional organizations and engagement activities, graduates of the College of Southern Maryland's Computer Science with Cloud Computing AS program will achieve the following intended student learning outcomes:

Students will…

1. Develop solutions to real world problems using Cloud Computing technologies.
2. Construct cloud computing solutions using industry best practices.
3. Document solution architecture to aide in maintenance and future upgrades.
4. Demonstrate ethical and professional practices when deploying solutions
5. Communicate with team members to develop solutions.

Our Academic Planning and Assessment's office's focus is the primary mission of the college: to provide quality opportunities for intellectual development that result in student learning. Our Student Learning Outcomes Assessment Plan (SLOAP) outlines the process of collecting information to determine whether CSM's academic offerings are having the appropriate educational impact on students. Student Learning Outcomes Assessment (SLOA) is defined as the systematic collection of information about academic offerings and analysis thereof, for the purpose of improving student learning.

Program Assessment at CSM is a cyclical process that includes:

1. Program Reviews conducted every five-six years, or more often as needed.
2. Academic certificate programs are included within the review of degree programs.
3. Program Monitoring conducted every other year (except in the year of a Program

Review).

4. Program Assessments of Student Learning conducted on a cycle established by faculty.

In addition, CSM conducts course evaluations every semester or, more often when deemed necessary

**List of courses with title, semester credit hours and course descriptions, along with a description of program requirements.**

CSC-1110 - Program Design and Development* (3)
Prerequisite: MTH 0940 or MTH 0950 or higher
Students learn to solve business-oriented problems with emphasis on structured and object-oriented programming techniques. Design tools are used to develop pseudo-code, flowcharting and 3D interactive environments. Students are introduced to several software packages that may be used to develop pseudo-code, flowcharts and interactive 3D environments. ITS-1110 is now CSC-1110.

CSC-2591 - Computer Science I* (4)
Prerequisite: CSC 1110 or EGR 1100 or Advanced Placement Exam score of 3 in Computer Science A or a score of 4 or 5 in Computer Science Principles.
This first course in object-oriented programming provides a comprehensive introduction to the fundamentals of object-oriented program design (overloading, data abstraction, inheritance and polymorphism), debugging, and testing. The students learn the concepts of modular object-oriented program and algorithm design via various projects throughout the semester. File processing, array manipulation, and elementary searching (sequential and binary) and sorting (selection, insertion, merge) algorithms are introduced. ITS-2591 is now CSC-2591.

CSC-2592 - Computer Science II* (4)
Prerequisite: CSC 2591
This course builds on the first course training students to better employ advanced data-structures (two dimensional arrays, linked lists, stacks, queues, trees, heaps, priority queues, sets and maps) and algorithms (hashing, quick-sort, heap-sort) to large programming projects. Students learn how to manipulate various data-structures: traversal, insertion, and deletion. Efficiency of various data-structures is explored via worst and average-case time and space analysis. ITS-2592 is now CSC-2592.

CSC-2740 - Data Structures and Algorithms* (4)
Prerequisite: CSC 2592 MTH 2500
This course provides comprehensive introduction to analysis and design of computer algorithms. Students are trained to analyze and evaluate the asymptotic performance (worst, average and best case) of various algorithms. Students understand that the average-case running time of algorithms is probabilistic and are able to employ the linearity of expectations to analyze them. Students are able to explain correctness of algorithms using inductive proofs and loop invariants. The course also explores various divide-and-conquer algorithms and solutions to recurrences. Understand the greedy paradigm and explain the appropriate use of it in algorithm design. Graph algorithms and elementary data structures for implementing them are also explored. Upon successful completion of this course, students are able to synthesize efficient algorithms for various system designs. ITS-2740 is now CSC-2740.

CSC-2750 - Computer Architecture* (4)
Prerequisite: CSC 2591 or ELT 2022

Utilizing a widely used real world microcontroller, this course explores the internal architectures of microprocessors and how hardware components are interconnected to external peripherals. Through various programming assignments we will learn how the processor utilizes the control and data paths to access memory and peripherals. The importance of the memory map is emphasized. The course will also explore various ways to measure and improve a microprocessors performance. Topics covered include pipelining superscalar, memory hierarchies (cache and virtual memory) and instruction set. Other topics covered include digital logic circuits and the representations of numbers and data. ITS-2750 is now CSC-2750.

ECN-1015 - Introduction to Business in a Market Economy* (3)
Prerequisite: ENG 0900 and RDG 0800
Students examine business in the United States as a social institution. Topics include economic systems, legal factors, government regulations, forms of ownership, management, employee relations, finance, accounting, and marketing. ECN-1015 replaces BAD-1010. Students who have taken BAD-1010 may not take ECN-1015 for credit. This course satisfies the General Education Social/Behavioral Science requirement.

ENG-1010 - Composition and Rhetoric* (3)
Prerequisite: ENG 0900; and RDG 0800; or placement
Students in this course complete their first semester college-level composition course. Students focus on planning, organizing, and developing a variety of argumentative compositions. Students practice the conventions of written Standard American English, gain information literacy skills, and learn research and documentation techniques including conducting online and print research and documenting sources. By the end of the semester, students demonstrate their ability to write a unified and coherent argument-based essay of about one thousand words that incorporates research and is nearly free of grammatical, mechanical, and structural errors. Students should refer to the schedule of classes for sections of this course taught in a computer lab. Students must pay an additional lab fee when taking this course in a computer-assisted classroom. Students may earn credit for this course through CLEP or Advanced Placement Examination. A minimum grade of "C" is required to pass the course. This course satisfies the General Education English Composition requirement.

ENG-1020 - Composition & Literature* (H) (3)
Prerequisite: ENG 1010
Students in this course complete their second semester college-level composition course. Using critical literary analysis, students build on the planning, organizing, and critical analysis skills learned in ENG-1010, Composition and Rhetoric. Students use literature, such as short fiction, poetry, and drama as the basis of their critical analysis and to extend, deepen, and illuminate students' own experiences and connections with the larger world and contemporary issues. Students further master the conventions of written Standard American English, information literacy skills, and research and documentation techniques including conducting online and print research and documenting sources. By the end of the semester, students demonstrate their ability to write a unified, coherent argument-based essay of about one thousand words that is nearly free of grammatical, mechanical, and structural errors. Students may earn credit for this course through CLEP or Advanced Placement Examination. This course satisfies the General Education Humanities requirement.

ITS-1050 - Computing Essentials* (3)
Students gain knowledge and practical experience with PC hardware and peripherals, mobile device hardware, networking and troubleshooting, hardware and network connectivity issues. Students also gain practical experience installing and configuring popular operating systems.

Students will be introduced to topics in security, the fundamentals of cloud computing and operational procedures. Additionally, students will gain practice using Office productivity software tools such as Excel. This course helps students to prepare for the CompTIA A+ Certification.

ITS-2090 - Computer Security* (3)
Prerequisite: ITS 1050
ITS-2090 covers the fundamentals of operational security, network security, managing a public key infrastructure (PKI), authentication, access control, external attack, and cryptography. Students learn about the security procedures to protect data in computer environments, the different network attack scenarios, the many tools and procedures used by organizations to protect their resources, and the ethical issues raised by computer security in the business world. This course helps prepare students for the CompTIA Security+ exam. The vendor neutral CompTIA Security+ certification is the acceptable industry-level security certification. For students who plan to use personal computers, this course may have specific computing requirements. Please refer to the Quick Link for Computing Requirements on the Business, Technology, and Public Service website.

ITS-2400 – Introduction to Cloud Computing* (3)
Prerequisite: ITS 1050
This course is for students who seek a foundational understanding of cloud computing concepts, independent of specific technical roles. It provides an overview of cloud concepts, core services, security, architecture, pricing, and support. This course helps students to prepare for the AWS Certified Cloud Practitioner exam.

ITS-2480 - Data Analytics* (3)
Prerequisite: CSC 1110 ITS 1120, MTH 1015
The emergence of new data sources is transforming the role of the data analyst from one who simply reports information to one who is charged with making sense of the available data and distilling it for a given audience. This course emphasizes fundamental coursework on the standards and practices for collecting, organizing, managing, exploring, and using data. Topics include preparation, analysis, and visualization of data and creating analysis tools for larger data sets.

MTH-1015 - Introduction to Statistics* (3)
Prerequisite: MTH 0940 or MTH 0970
In this introduction to descriptive and inferential statistics, students learn about presentation of data, measures of central tendency and dispersion, the binomial and normal probability distributions, sampling techniques, correlation and regression, and hypothesis testing (z-test, t-test, chi-squared). Examples are selected from education, business, and the social and natural sciences. This course satisfies the General Education Mathematics requirement. MTH-2300 is now MTH-1015.

MTH-1200 - Calculus I and Analytic Geometry* (4)
Prerequisite: MTH 1150; or MTH 1120 and MTH 1130
This first course in the calculus sequence is intended for students in the fields of mathematics, engineering, and the physical and life sciences. Topics include limits, continuity, derivatives, basic differential equations, parametric equations, indefinite and definite integration. Differential calculus applications include L'Hopitals Rule, curve sketching, optimization, Newton's Method, and rate problems, and integral calculus applications include areas of regions. This course satisfies the General Education Mathematics requirement.

## Recommended Course Sequence:

**First Semester**
CSC-1110 Program Design and Development* (3)
ECN-1015 Introduction to Business in a Market Economy* (3)
ENG-1010 Composition and Rhetoric* (3)
Biological/Physical Sciences (3) See Gen Ed Listing
MTH-1015 Introduction to Statistics* (3)

**Second Semester**
Biological/Physical Sciences with Lab (4) See Gen Ed Listing
CSC-2591 Computer Science I* (4)
ENG-1020 Composition and Literature* (3)
ITS-1050 Computing Essentials* (3)
Arts/Humanities (3)

- Select from Gen Ed Listing and select any Arts/Humanities course from within the Cultural and Global Awareness course list.

**Third Semester**
MTH-1200 Calculus I and Analytic Geometry*(4)
Social/Behavioral Sciences (3) See Gen Ed Listing
ITS-2400 Introduction to Cloud Computing* (3)
CSC-2592 Computer Science II* (4)

**Fourth Semester**
CSC-2740 Data Structures and Algorithms* (4)
CSC-2750 Computer Architecture* (4)
ITS-2090 Computer Security* (3)
ITS-2480 Data Analytics* (3)

## Program Description for the Catalog:

This program provides students with an introduction to the concept of virtualization. Virtualization is achieved through using both hardware and software in a manner that gives the perception that a physical environment exists when, in fact, it may not. Students will understand how cloud computing systems utilize virtual memory to provide applications with the ability to run better and faster without adding more physical memory. Students will explore the concept of server virtualization, which similarly gives the appearance and benefit of having multiple processors running simultaneously. Students will evaluate the present status and future direction of cloud computing. Actual virtualization software will be used to provide students with a real-world experience.

Students will take classes that will help to prepare for the following in-demand entry level cloud computing and IT industry certifications: CompTIA A+, CompTIA Security+, and AWS Certified Cloud Practitioner.

All of the courses in this program are available online with in-person class options.

Professionals with a strong IT background may contact the program coordinator or chair about obtaining prerequisite waivers to take certain classes in this program.

Students may be eligible to receive Credit for Prior Learning through Certification Evaluation with any of the following current certifications: CompTIA A+, CompTIA Security+, and AWS Certified Cloud Practitioner.

Students should meet with an advisor to discuss Certification Evaluation, transfer evaluation, or options for transfer to 4-year colleges with this program.

The maximum number of credits accepted in transfer from other institutions to this program is 45.

Career Opportunities:
IT Systems Administrator, Cloud Computing Analyst, Network Engineer, Solution Architect, Cloud Engineer, Software Developer, Applications Developer, Computer Systems Analyst

Transfer Options:
A complete list of all transfer opportunities can be found on the Transfer Services page

Student Learning Outcomes:
Students will…

6. Develop solutions to real world problems using Cloud Computing technologies.
7. Construct cloud computing solutions using industry best practices.
8. Document solution architecture to aide in maintenance and future upgrades.
9. Demonstrate ethical and professional practices when deploying solutions
10. Communicate with team members to develop solutions.

**AA, AS, ASE, AAT**

| **General Education** | |
|---|---|
| 3 credits English Composition | ENG-1010 Composition and Rhetoric* (3) |
| 6 credits Arts/Humanities | ENG-1020 Composition and Literature* (3)<br>Select from Gen. Ed. Listing of Courses Within Cultural & Global Awareness Course List (3) |
| 3 credits Biological/Physical Sciences | Select from Gen. Ed. Listing (3) |
| 4 credits Biological/Physical Sciences (with lab) | Select from Gen. Ed. Listing (4) |
| 6 credits Social/Behavioral Sciences | ECN-1015 Introduction to Business in a Market Economy* (3)<br>Select from Gen. Ed. Listing (3) |
| 3 credits Mathematics | MTH-1015 Introduction to Statistics* (3) |
| Other General Education (from above categories) (3-11 credits) | MTH-1200 Calculus I and Analytic Geometry*(4) |

| | |
|---|---|
| **MHEC requires 28-36 credits** | **Total General Education=29** |
| **Major requirements** | CSC-1110 Program Design and Development* (3)<br>CSC-2591 Computer Science I* (4)<br>CSC-2592 Computer Science II* (4)<br>CSC-2750 Computer Architecture* (4)<br>ITS-2480 Data Analytics* (3)<br>CSC-2740 Data Structures and Algorithms* (4)<br>ITS-1050 Computing Essentials* (3)<br>ITS-2090 Computer Security* (3)<br>ITS-2400 Introduction to Cloud Computing* (3) |
| | **Major Requirements=31** |
| **Electives** | none |
| | **Electives= 0** |
| | **Credit total= 60** |
| *courses requiring a prerequisite | |

CSM provides information to students about our program offerings in numerous ways, including Campus Open Houses and Tours, Presentations at local high schools, Orientation and Registration sessions, and New Student Welcome events. They are provided with information about applying to CSM, college readiness, financial aid, payment policies, technical requirements, including our LMS, and the many academic support services.

Advisors are available in-person and through videoconferencing sessions. We also have a faculty advising training program to equip faculty to advise students after they have completed 30 credits towards their degree.

Other student services include learning support services such as tutoring, workshops, and learning labs, library services, counseling services, testing services on all campuses, and disability, and Veteran & Military support services.

Students are provided with a CSM email account and access to Microsoft Office software with information about our technology services support and help desk.

Our students are notified in writing of changes than may impact their program planning. Because the new elective offerings are courses that are already being offered, we do not anticipate any major challenges in implementing the proposed changes.

Our Admissions Department works closely with the Marketing Department and the Division of Academic Affairs to ensure that the recruitment and admissions materials will clearly and accurately represent our programs and services available. The Admissions Department identifies prospective students; recruits and admits new students; and provides information regarding the college to all prospective and current students and the community. The department works collaboratively with the Enrollment Management Team to support the college's efforts to attract students and assist them in defining and achieving their goals and in providing the highest quality customer service.

The goal of the Recruitment Team is to attract traditional and returning adults to the college through several avenues that include presentations to middle and high schools, civic

organizations, businesses, alternative schools, college fairs and information sessions. In addition, the team is responsible for post test advising for new students in order to ensure a smooth transition into the college community. Team members are available to meet with anyone interested in learning more about the college and how it can help them realize their potential.

As the focal point of college information, the Call Center staff responds to questions on how to start the college application process, provides assistance with log-in and account restrictions, and answers many general questions about the college.

As a team, our Marketing Department completes more than 500 projects each year to support and promote the many programs and initiatives at CSM. The team provides website support and is responsible for accurately representing all of our programs and services available at CSM.

## H. Adequacy of Articulation

CSM has a new transfer agreement with this program with this institution:

- St. Mary's College of Maryland [Appendix A]

## I. Adequacy of Faculty Resources (as outlined in COMAR 13B.02.03.11).

As described in Section G, our program faculty is comprised of both full-time and part-time faculty and come from diverse professional and academic backgrounds. Our full-time faculty include both new instructors as well as long-time tenured faculty with both academic credentials and industry certifications in the field of computer science, software development, cloud computing, information science, cybersecurity, and related fields. Some of our full-time faculty have current industry experience in the field of computer science and cloud computing as well. We have full-time faculty members with various IT industry certifications, including CompTIA Security+, $ISC^2$ CISSP, and AWS Certified Cloud Practitioner. Our adjunct faculty are current practitioners in various IT areas, and they come with a great deal of relevant expertise to enrich their teaching and benefit our students.

Our Distance Learning and Faculty Development (DLF) division provides support to faculty in training and administration of our learning management system (LMS). All new faculty are required to complete LMS training. Other training courses are also available to all faculty, including training on teaching web-hybrid classes and refresher training.

The DLF division also provides support for faculty conference attendance and additionally hosts an annual professional development 2-day conference for both full-time and adjunct faculty. Additionally, the DLF team coordinates pre-semester professional development activities for all faculty.

| Faculty Member Name | Terminal Degree | Full-time or Part-time | Courses Taught |
|---|---|---|---|
| Joe Burgin | BA and w/15 credits towards MS in Analytics, expected MS degree completion in 2021 | Full-time | ITS-1050, ITS-2480 (beginning in Spring 2020) |

| | | | |
|---|---|---|---|
| Christopher Estes | MBA, ISC$^2$ CISSP certification | Full-time | CSC-1110, CSC-2592, ITS-1050, ITS-2090 |
| Lakisha Ferebee | B.A. - Interdisciplinary Studies, CompTIA Security+ certification | Full-time | ITS-1050, ITS-2090 |
| Lawrence Gross | M.S. - Technology Management | Part-time | ITS-2090 |
| Ronda Jacobs | M.A. – Adult Education & Distance Learning | Full-time | ITS-1050, ITS-2400 (ITS-2400 will be offered starting in Summer 2020) |
| Eugen Leontie | Ph.D. - Computer Science, AWS Certified Cloud Practitioner certification | Full-time | CSC-1110, CSC-2750, ITS-2400 (ITS-2400 will be offered starting in Summer 2020) |
| Terrell Smith | M.S. - Information Technology: Information Assurance, CompTIA Security+ certification | Part-time | ITS-1050, ITS-2090 |
| Kathleen Wallace | B.S. - Information Technology, ISC$^2$ CISSP, EC Council Certified Ethical Hacker (CEH), CompTIA Security+ certifications | Part-time | ITS-2090 (Spring 2020) |
| Richard White | M.S. – Information Technology, Database Adm. | Full-time | CSC-1110, CSC-2591, CSC-2592, ITS-2480 |
| Brian Warnecke | M.S. – Electrical Engineering | Full-time | CSC-2740 |
| John Wilson | M.A. – National Security Affairs | Full-time | ITS-1050 |

**J. Adequacy of Library Resources** (as outlined in COMAR 13B.02.03.12)**.**

Students may borrow circulating materials from any of the three CSM library branches. Through the interlibrary loan program (ILL), students can order almost any book, periodical article, or ERIC document needed, generally available within one week of the request. Library resources also include audiovisual collections use in the library and classrooms only. Additionally, substantial material is available through online databases, including ProQuest and EBSCO.

The President assures that appropriate library resources are available to support the needs of this program.

**K. Adequacy of Physical Facilities, Infrastructure and Instructional Equipment** (as outlined in COMAR 13B.02.03.13)

CSM is a leader among Maryland community colleges in offering courses which meet the busy schedules of our students, traditional weekday face to face courses, weekend and evening classes, Web-hybrid courses which offer a mix of online and traditional classroom face-to-face instruction and a popular online learning community. The college makes available state of the art facilities on three campuses to accomplish its mission in support of our community's academic, professional, and self-enrichment pursuits.

The Computer Science with Cloud Computing AS degree program be available online, with in-person courses conducted primarily on the La Plata campus, in the ST building, home to the Business, Technology, and Public Service Division. Many classes will also be offered at the Leonardtown and Prince Frederick campuses. Many business classes are offered in the BU building. The ST and BU buildings house state of the art classrooms, conference rooms, faculty and administrative offices, computer labs, Student Computer Support department (help desk) and science laboratories. We have computer labs available on all three campuses at the La Plata, Leonardtown, and Prince Frederick campuses that are equipped with necessary software and equipment to teach our courses.

The President assures that appropriate physical facilities, infrastructure, and instructional equipment are available to support the needs of this program.

**L. Adequacy of Financial Resources with Documentation** (as outlined in COMAR 13B.02.03.14)

| TABLE 1: RESOURCES | | | | | |
|---|---|---|---|---|---|
| **Resource Categories** | **Year 1** | **Year 2** | **Year 3** | **Year 4** | **Year 5** |
| 1. Reallocated Funds | 0 | 0 | 0 | 0 | 0 |
| 2. Tuition/Fee Revenue (c + g below) | $240,090 | $260,475 | $283,125 | $310,305 | $339,750 |
| a. Number of F/T Students** | 20 | 20 | 20 | 20 | 20 |
| b. Annual Tuition/Fee Rate ($151 x 21 credits)* | $3,171 | $3,171 | $3,171 | $3,171 | $3,171 |
| c. Total F/T Revenue (a x b) | $63,420 | $63,420 | $63,420 | $63,420 | $63,420 |
| d. Number of P/T Students*** | 78 | 87 | 97 | 109 | 122 |
| e. Credit Hour Rate | $151 | $151 | $151 | $151 | $151 |
| f. Annual Credit Hours Rate | 15 | 15 | 15 | 15 | 15 |
| g. Total P/T Revenue (d x e x f) | $176,670 | $197,055 | $219,705 | $246,885 | $276,330 |
| 3. Grants, Contracts & Other External Sources | 0 | 0 | 0 | 0 | 0 |
| 4. Other Sources | 0 | 0 | 0 | 0 | 0 |
| TOTAL (Add 1 – 4) | $240,090 | $260,475 | $283,125 | $310,305 | $339,750 |
| * The credit hour rate ($151) is based upon CSM's current tuition rate of $123 plus 23% combined fee. | | | | | |

** Full Time enrollment has been flat.

*** Part Time enrollment has been increasing at approximately 12% yearly.

| TABLE 2: EXPENDITURES: | | | | | |
|---|---|---|---|---|---|
| **Expenditure Categories** | **Year 1** | **Year 2** | **Year 3** | **Year 4** | **Year 5** |
| 1. Faculty (b + c below) | $ 140,000 | $ 140,000 | $ 140,000 | $ 140,000 | $ 140,000 |
| a. # FTE | 1 FT x 5 courses & 2 Existing Courses | 2 FT x 5 courses & 2 Existing Courses | 3 FT x 5 courses & 2 Existing Courses | 4 FT x 5 courses & 2 Existing Courses | 5 FT x 5 courses & 2 Existing Courses |
| b. Total Salary | $ 140,000 | $ 140,000 | $ 140,000 | $ 140,000 | $ 140,000 |
| c. Total Benefits | 0 | 0 | 0 | 0 | 0 |
| 2. Admin. Staff (b + c below) | 0 | 0 | 0 | 0 | 0 |
| a. # FTE | 0 | 0 | 0 | 0 | 0 |
| b. Total Salary | 0 | 0 | 0 | 0 | 0 |
| c. Total Benefits | 0 | 0 | 0 | 0 | 0 |
| 3. Support Staff (b + c below) | 0 | 0 | 0 | 0 | 0 |
| a. # FTE | 0 | 0 | 0 | 0 | 0 |
| b. Total Salary | 0 | 0 | 0 | 0 | 0 |
| c. Total Benefits | 0 | 0 | 0 | 0 | 0 |
| 4. Equipment | 0 | 0 | 0 | 0 | 0 |
| 5. Library | 0 | 0 | 0 | 0 | 0 |
| 6. New or Renovated Space | 0 | 0 | 0 | 0 | 0 |
| 7. Other Expenses | 0 | 0 | 0 | 0 | 0 |
| TOTAL (Add 1 – 7) | $ 140,000 | $ 140,000 | $ 140,000 | $ 140,000 | $ 140,000 |

**M. Adequacy of Provisions for Evaluation of Program** (as outlined in COMAR 13B.02.03.15).

CSM conducts course evaluations every semester or, more often when deemed necessary.

To address online academic rigor and faculty presence, in coordination with our Distance Learning and Faculty Development (DLF) division, our online courses undergo additional review through our internal Online Academic Rigor and Presence (OARP) process. Our OARP process is comprised of a self-review followed by peer review and remediation.

Faculty are evaluated annually according to the process outlined in CSM's "Faculty Handbook".

As described in Section G, our Academic Planning and Assessment's office's focus is the primary mission of the college: to provide quality opportunities for intellectual development that result in student learning. Our Student Learning Outcomes Assessment Plan (SLOAP) outlines the process of collecting information to determine whether CSM's academic offerings are having the appropriate educational impact on students. Student Learning Outcomes Assessment (SLOA) is defined as the systematic collection of information about academic offerings and analysis thereof, for the purpose of improving student learning.

Program Assessment at CSM is a cyclical process that includes:

1. Program Reviews conducted every five-six years, or more often as needed.
2. Academic certificate programs are included within the review of degree programs.
3. Program Monitoring conducted every other year (except in the year of a Program Review).
4. Program Assessments of Student Learning conducted on a cycle established by faculty.

**N. Consistency with the State's Minority Student Achievement Goals** (as outlined in COMAR 13B.02.03.05).

One of CSM's Values/Guiding Principles is Diversity. The Institutional Equity and Diversity Office works to "create an environment that instills an appreciation and understanding of the diverse qualities each of us brings to this campus; where our students, staff, and faculty mirror the community we serve and are free from discrimination and harassment."

Additionally, CSM defines civility as "the demonstration of respect for others through basic courtesy and the practice of behaviors that contribute toward a positive environment for learning and working."

As is true of CSM, the Computer Science with Cloud Computing AS Program is open to all students with no restrictions reference to age, gender, or ethnic background. As such, any student meeting the eligibility requirements of the college admissions process is entitled to enroll in this discipline of study. Furthermore, CSM, the Business, Technology, and Public Services Division, and representatives of the Computer Science with Cloud Computing AS Program all participate in events, programs, orientations, and information sessions sponsored internally or by external advocates in order to reach all students seeking information on the college's programs and the professional opportunities that result from that education and training.

CSM's marketing department is developing a comprehensive marketing plan for this new program. These resources include the designing and printing of brochures, assistance with marketing campaigns (web and traditional news media), and development of other recruitment materials. CSM is committed to ensuring new programs are marketed to diverse populations, as demonstrated by the organizational values, which include valuing diversity. Marketing plans will include activities specifically designed to market the program to the diverse population of the tri-county region.

Diversity and multiculturalism are vitally important issues for future leaders. As such, the representatives of this new program at CSM intend to contact multiple professional associations, national, regional and local employers, secondary and postsecondary institutions to create partnerships that will lead to the diversity of our student population and graduates of our programs.

**O. Relationship to Low Productivity Programs Identified by the Commission:**

The proposed degree is not directly related to an identified low productivity program identified by the Commission.

**P. Adequacy of Distance Education Programs** (as outlined in COMAR 13B.02.03.22)

This program is not offered as a distance education program.

References

Gartner Forecasts Worldwide Public Cloud Revenue to Grow 17.5 Percent in 2019. (2019, April 2). Retrieved January 2, 2020, from https://www.gartner.com/en/newsroom/press-releases/2019-04-02-gartner-forecasts-worldwide-public-cloud-revenue-to-g.

Strack, R., Kaufman, E., & Kotsis, A. (2019, September 12). What's Trending in Jobs and Skills. Retrieved from https://www.bcg.com/publications/2019/what-is-trending-jobs-skills.aspx.

Appendix A:  St. Mary's College of Maryland Pending Transfer Agreement

# Articulation Agreement

## The College of Southern Maryland

**Computer Science with Cloud Computing**

**AND**

## The St. Mary's College of Maryland (SMCM)

**Computer Science**

### PREFACE

St. Mary's College of Maryland (SMCM) welcomes students from College of Southern Maryland into our community of learners. This Articulation Agreement is designed to facilitate College of Southern Maryland students' ease of transfer from the Computer Science with Cloud Computing program at College of Southern Maryland to the SMCM Computer Science program. This Agreement augments any Guaranteed and Dual Admission agreements signed between The College of Southern Maryland and SMCM.

Under this Agreement, College of Southern Maryland students graduating with an Associate of Science (A.S.) in Computer Science with Cloud Computing will be eligible for admission into SMCM Computer Science program, provided that students:

1. Submit the SMCM Application for Admission at least six months prior to the start of the semester they wish to transfer to St. Mary's College of Maryland.
2. Complete the required courses as described in the Appendix A of this agreement.
3. Satisfy all other SMCM admissions requirements, which are available on the College website at http://www.smcm.edu or by contacting an admissions counselor at St. Mary's College of Maryland.
4. Graduate from College of Southern Maryland with a minimum cumulative grade-point average (GPA) of 3.00.
5. Recognize that grades of "C-" or better will transfer and will be transcribed as transfer credits or "TR" on the SMCM transcript. Per the Code of Maryland Regulations (COMAR), grades of D will transfer although may not be used for major/minor requirements.
6. Understand that there is no residential living requirement for incoming students, though transfer students may request on-campus housing if they wish.
7. Understand that SMCM will accept up to 70 transferable credits.
8. Understand that students with at least 56 transferable credits will enter with Junior status.
9. Submit College of Southern Maryland transcripts along with transcripts from any other colleges they may have attended prior to attending College of Southern Maryland.

SMCM welcomes International Students to apply to the College. Additional admission materials will include the Test of English as a Foreign Language (TOEFL) and WES transcript evaluations if applicable. Please check the College website at http://www.smcm.edu for details.

This Agreement is also available to part-time students.

### ALTERNATIVES TO THIS AGREEMENT

Students interested in Dual Admission to SMCM are encouraged to consult with an Academic Adviser at College of Southern Maryland and the Office of Admissions at SMCM to assist in choosing courses to promote timely graduation from SMCM. Transcripts will be evaluated on a preliminary basis by the SMCM Admissions Office prior to application upon request.

### OBLIGATIONS OF ST. MARY'S COLLEGE OF MARYLAND

To facilitate the transfer of College of Southern Maryland graduates to the SMCM Computer Science program in accordance with the foregoing, SMCM agrees to the following:

# Articulation Agreement

1. To attend regularly scheduled transfer programs at College of Southern Maryland.
2. To invite College of Southern Maryland students to information/advising meetings with SMCM faculty and staff on a regular basis at both College of Southern Maryland and SMCM in order to facilitate smooth curricular and co-curricular integration to St. Mary's College of Maryland.
3. To send SMCM letters of admission to all College of Southern Maryland students who meet the conditions set forth herein and confirm their intention to matriculate at SMCM. It is recommended that students confirm their intention to matriculate at SMCM by June 1st for the fall semester, or by December 1st for the spring semester and satisfy all other regular SMCM admissions requirements.
4. Those students entering fulltime study at SMCM are eligible to be awarded academic scholarships and/or grants per established guidelines at the time of enrollment.

   Scholarships are renewable on an annual basis and students must meet with a Financial Aid advisor for additional information. SMCM offers a variety of scholarships and grant awards. These opportunities include merit-based and need-based aid and grants. Sources of these awards include SMCM, private donors, as well as federal and state programs.
5. To ensure that incoming students will be provided with SMCM financial aid information and receive full consideration for SMCM financial aid, in addition to appropriate scholarships and grants listed above, upon matriculation at St. Mary's College of Maryland.
6. To ensure that College of Southern Maryland graduates entering SMCM under the terms of this Agreement go through SMCM's normal transfer admissions process, including meeting all applicable SMCM requirements and deadlines pertaining to application for admission, orientation and registration, and payment of tuition and fees. They will abide by the policies and procedures, and any revisions thereof that apply to all SMCM students. Incoming matriculated students will have all the rights and privileges of other SMCM students.
7. To periodically invite College of Southern Maryland students to SMCM events.

**OBLIGATION OF COLLEGE OF SOUTHERN MARYLAND**

College of Southern Maryland agrees to publicize this agreement to prospective and current College of Southern Maryland students in its promotional literature, and make special arrangements for SMCM recruiters and advisors to visit College of Southern Maryland to meet with prospective and current Computer Science students.

**JOINT OBLIGATIONS**

1. To inform each other through appropriate channels prior to implementing major changes in policy or curricula that directly affect students transferring under the terms of this Agreement, and keep each other informed of any changes of policy or curricula that affect those students. Both SMCM and College of Southern Maryland will review this Articulation Agreement on a regular basis and make changes upon mutual agreement, as needed. Such changes will be effective when both College of Southern Maryland and SMCM sign the revised document.
2. Students are required to graduate from College of Southern Maryland with a minimum GPA of 3.00. Transferrable courses with grades of D or better will be brought into SMCM as transfer credits. A minimum grade of C- or better is required in courses counting toward Computer Science. A grade of C- or better is required in all computer science and mathematics courses.

3. To collaborate in providing students with information and academic advising both from SMCM and College of Southern Maryland. SMCM will make available contact information for questions about St. Mary's College of Maryland's academic requirements, Core Curriculum requirements, degree requirements, and the process of transferring to SMCM.
4. To jointly agree to develop and implement advertising and promotional efforts to communicate the benefits of this Articulation Agreement.
5. To designate that the SMCM Department Chair and the CSM Coordinator of Transfer and Articulation will coordinate this agreement.
6. To exchange data and documents on a regular basis that will contribute to the maintenance and improvement of the arrangement, enhance the transfer process, and promote effective cooperation between institutions. These will consist of data about individual transfer students, including admissions information and grades, and reports on the results of program reviews, assessments of students' learning, and decisions of curricula and other committees.
7. This Agreement may be updated (by means of addenda), upon mutual agreement by appropriate officials of the two institutions, to allow for additional curriculum articulation sheets accommodating course equivalencies for specific major(s)/minor(s)/certificate program(s). This Agreement sets forth the entire understanding of the parties with respect to the subject matter hereof and supersedes all prior understandings, memos, writings or agreements of the parties with respect to the subject matter hereof. Any waiver by a party of any of its rights or of the other party's obligations must be in writing.
8. To provide, when available, direct links between the SMCM and College of Southern Maryland websites when applicable.

**REVISIONS, RENEWAL, AND TERMINATION OF THIS AGREEMENT**

The SMCM Provost and Dean of Faculty and the CSM Vice President of Academic Affairs and Coordinator of Transfer and Articulation are responsible for identifying and communicating to each other changes in the policies or requirements of their respective institutions that affect this Articulation Agreement.

This Articulation Agreement will be in effect, as of the date of its signing, for students entering SMCM fall semester 2019 or after. It will be reviewed on a yearly basis by the appropriate parties at each institution and will be renewed automatically until superseded by new Agreements or formally terminated. Either institution may terminate this Agreement at any time by written notice at least one year in advance of the effect date of termination. Should this Agreement be terminated, it is understood that the termination will not apply to students already accepted to SMCM under the terms of this Agreement.

# Articulation Agreement

The willingness of both institutions to enter this Articulation Agreement in order to facilitate the transfer of students from College of Southern Maryland to St. Mary's College of Maryland, and to expand their opportunities for academic success there, is indicated by the following signatures. The undersigned representatives of the parties, College of Southern Maryland and St. Mary's College of Maryland, have executed this Articulation Agreement on the dates indicated:

| College of Southern Maryland | St. Mary's College of Maryland |
|---|---|
| Eileen D. Abel<br>Vice President for Academic Affairs<br>Date | Michael R. Wick<br>Provost and Dean of Faculty<br>1/15/2020<br>Date |

# APPENDIX A

| College of Southern Maryland | | | | St. Mary's College of Maryland | | | |
|---|---|---|---|---|---|---|---|
| **Recommended Courses** | | | | **St. Mary's College Course Equivalents** | | | |
| Prefix | Number | Title | Credits | Prefix | Number | Title | Credits |
| | | TOTAL RECOMMENDED CREDITS | 0.00 | | | TOTAL GRANTED CREDITS FROM RECOMMENDED COURSES | 0.00 |
| **Required Courses** | | | | **St. Mary's College Course Equivalents** | | | |
| Prefix | Number | Title | Credits | Prefix | Number | Title | Credits |
| MTH | 1200 | Calculus I and Analytic Geometry | 3.00 | MATH | 151 | Calculus I | 3.00 |
| CSC | 1110 | Program Design and Development | 3.00 | COSC | | Lower-Level COSC Elective | 3.00 |
| CSC | 2591 | Computer Science I | 4.00 | COSC | 120 | Intro. To Computer Science I | 4.00 |
| CSC | 2592 | Computer Science II | 4.00 | COSC | 130 | Intro. To Computer Science II | 4.00 |
| CSC | 2750 | Computer Architecture | 4.00 | COSC | 230 | Computer Architecture | 4.00 |
| CSC | 2740 | Data Structures and Algorithms | 4.00 | COSC | 201 | Algorithms and Data Structures | 4.00 |
| ITS | 2400 | Introduction to Cloud Computing | 3.00 | COSC | | Lower-Level COSC Elective | 3.00 |
| ITS | 1050 | Computing Essentials | 3.00 | COSC | | Lower-Level COSC Elective | 3.00 |
| ITS | 2480 | Data Analytics | 3.00 | COSC | | Lower-Level COSC Elective | 3.00 |
| ITS | 2090 | Computer Security | 3.00 | COSC | | Lower-Level COSC Elective | 3.00 |
| | | TOTAL ELECTIVE CREDITS | 34.00 | | | TOTAL GRANTED ELECTIVE CREDITS | 34.00 |
| | | **GRAND TOTAL CREDITS** | 34 | | | **GRAND TOTAL GRANTED CREDITS** | 34.00 |

# APPENDIX A

## Remaining Degree Requirements at St. Mary's College of Maryland and Advising Sheet

### First Fall Semester at St. Mary's College

| Prefix | Number | Title | Credits |
|---|---|---|---|
| CORE | 301 | Liberal Arts Seminar | 4 |
| COSC | | Upper Division Elective | 4 |
| | | Upper Division Elective | 4 |
| MATH | 152 | Calculus II | 4 |

### First Spring Semester at St. Mary's College

| Prefix | Number | Title | Credits |
|---|---|---|---|
| MATH | 200 | Discrete Mathematics | 4 |
| COSC | | Upper Division Elective | 8 |
| COSC | 493 | SMP (if chosen as capstone) | 2 |
| | | Elective Courses | 4 |

### Second Fall Semester at St. Mary's College

| Prefix | Number | Title | Credits |
|---|---|---|---|
| COSC | | Upper Division Elective | 4 |
| COSC | | Upper Division Elective | 4 |
| COSC | | Capstone (401)/SMP | 4 |
| | | Elective Course | 4 |

### Second Spring Semester at St. Mary's College

| Prefix | Number | Title | Credits |
|---|---|---|---|
| COSC | | Upper Division Elective | 4 |
| COSC | | Capstone (402)/SMP | 4 or 2 |
| | | Upper Division Elective | 4 |
| COSC | 251 | Programming Languages | 4 |

### First Summer at St. Mary's College (if needed for timely graduation)

| Prefix | Number | Title | Credits |
|---|---|---|---|

### Second Summer at St. Mary's College (if needed for timely graduation)

| Prefix | Number | Title | Credits |
|---|---|---|---|

### Additional Requirements

NOTE: Completion of the A.A. or A.S. Degree satisfies the foreign language requirement and the six categories of the *Liberal Arts Approaches to Understanding the World* requirement. Completion of CORE 301 and CORE 350 (or equivalent) are requirements of attending St. Mary's College of Maryland.