



**Division of Academic Programs**

One Seahawk Drive | North East, MD 21901 | 410-287-1000 | Fax: 410-287-1040 | [www.cecil.edu](http://www.cecil.edu)

---

May 23, 2018

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

Dear Dr. Fielder:

Attached is a proposal for a new Associate of Applied Sciences program for the Commission's review:

**AAS Computer Science - Programming**  
**HEGIS Code 0704.00; CIP Code 11.0201**

Formerly, this degree was available to students as an Option under our Computer Information Systems degree. We have enclosed our check in the amount of \$850 to cover the Commission's fee for review.

If there are any questions about this request, please contact Colleen Flewelling, Associate Dean of Academic Assessment and Development, at [cflewelling@cecil.edu](mailto:cflewelling@cecil.edu) or 443-674-1948.

Sincerely,

A handwritten signature in blue ink that reads "Christy Dryer".

Christy Dryer, DNP  
Vice President, Academic Programs

MARYLAND HIGHER EDUCATION COMMISSION  
ACADEMIC PROGRAM PROPOSAL

PROPOSAL FOR:

- NEW INSTRUCTIONAL PROGRAM  
 SUBSTANTIAL EXPANSION/MAJOR MODIFICATION  
 COOPERATIVE DEGREE PROGRAM  
 WITHIN EXISTING RESOURCES OR  
 REQUIRING NEW RESOURCES

(For each proposed program, attach a separate cover page. For example, two cover pages would accompany a proposal for a degree program and a certificate program.)

Cecil College  
Institutional Submitting Proposal

August 2018  
Projected Implementation Date

AAS  
Award to be Offered

Computer Science- Programming  
Title of Proposed Program

0704.00  
Suggested HEGIS Code

11.0201  
Suggested CIP Code

Sciences & Engineering  
Department of Proposed Program

Veronica Dougherty  
Name of Department Head

Colleen Flewelling  
Contact Name

cflewelling@cecil.edu  
Contact E-mail Address

443-674-1948  
Contact Phone Number

Mary Kay Bolt 5/17/18  
Signature and Date

President/Chief Executive Officer

April 26, 2018  
Date

Date Endorsed/Approved by Governing Board

**A. Centrality to institutional mission statement and planning priorities:**

Cecil College’s Computer Science - Programming program introduces students to the various technology domains, including operating systems, networking, data, security and programming. Problem solving and proper algorithm design are emphasized. Students will gain an understanding of abstracted layers and data structures. Cecil currently offers a programming option within our Computer Information Systems degree and is now creating a stand-alone Computer Science – Programming degree to replace it.

Thus, this program directly supports Cecil College’s mission to provide a supportive learning environment to students as they build the skills and knowledge to achieve academic success, prepare to transfer, and enter the workforce. In addition, as this program prepares students for transfer, the program supports the College’s mission to support access to higher education programs. Given the high cost of attending a four-year university, the proposed program can save students a significant amount by giving them the opportunity to complete the first two years of study at a community college.

**B. Critical and compelling regional or Statewide need as identified in the State Plan:**

The AAS in Computer Science - Programming provides an option for students who wish to transfer to a four-year program in programming. Students’ expenses for their degree are greatly reduced when they complete two years of their degree at Cecil College. The chart below compares tuition at 4-year state institutions which offer four-year degrees in computer science with the cost of attending Cecil College. Decreased expenses allow many students to complete a degree they would otherwise be unable to complete, supporting goal 2 (Access, Affordability and Completion) of the Maryland State Plan for Education.

Institution	Rate	Cost per credit 2018-19	Cost for 60 credits	Savings over 2 years
Cecil College	In-county	\$119	\$7,140	-
Bowie State University	In-state	\$239	\$14,340	\$7,200
Morgan State University	In-state	\$240	\$14,400	\$7,260
Salisbury University	In-state	\$287	\$17,220	\$10,080
University of Maryland University College	In-State	\$294	\$17,640	\$10,500

**C. Quantifiable & reliable evidence and documentation of market supply & demand in the region and State:**

A degree in Computer Science - Programming prepares a student for positions in computer support, system maintenance and management, computer programming, or web development. Maryland’s Department of Labor, Licensing and Regulation projects an increase from 2014-2024 in the number of openings for these types of positions.<sup>1</sup> These increases include:

<sup>1</sup> <http://dllr.maryland.gov/lmi/iandoproj/maryland.shtml>

Field	2014-2024 Percent Change in openings in Maryland
Computer User Support Specialists	+30.6%
Computer Systems Analysts	+36.6%
Web Developers	+32.7%
Computer Programmers	+16.4%

Cecil College has enrolled approximately 40 students per year in the currently existing Computer Information System - Programming Option. We anticipate that this enrollment will continue to grow modestly over the next five years.

**D. Reasonableness of program duplication:**

A search of the Maryland Higher Education Commission’s Academic Program Inventory database reveals several associate degree programs in computer science; however, there is only one other program focused on programming.

Institution	Program Name	Degree Offered
College of Southern Maryland	Computer Programming	AS

In addition, past enrollment patterns of approximately 40 students per year enrolled in the College’s Computer Information Systems – Programming Option programs suggest that our programs are meeting a need in Cecil County.

**E. Relevance to high-demand programs at Historically Black Institutions (HBIs)**

We anticipate there will be no impact on the implementation or maintenance of high-demand programs at HBI’s.

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

Bowie State University, University of Maryland Eastern Shore, and Morgan State University have bachelor’s degree programs in Computer Science. Cecil College has transfer agreements with all of these institutions, and therefore has the potential to send students to these programs.

**G. Adequacy of curriculum design, program modality, and delivery to related learning outcomes consistent with Regulation .10 of this chapter:**

The following information on degree requirements, learning outcomes and course descriptions will be made available to students in the college catalog, which can be found on the Cecil College website. Students may also consult with advisors and faculty members to learn about these programs.

Information about new programs is clearly and accurately represented in advertising, recruiting, and admissions materials. The College’s Academic Programs unit widely shares information about the requirements for new or changed degrees in MHEC-approved programs. The Admissions and Marketing departments use this information to update application and inquiry form, internal recruitment products, and other marketing materials.

Faculty at Cecil College design all courses and programs, which are then presented to the Academic Affairs Committee, a committee comprised primarily of faculty, for approval.

The following courses are required for the Computer Science - Programming degree:

	<b>Program Requirements (37 Credits)</b>	<b>Credits</b>
CSC 103	Operating Systems	3
CSC 106	Introduction to Programming Logic	3
CSC 109	Introduction to Programming	3
CSC 140	Introduction to Networking	3
CSC 182	Web Application Development	3
CSC 203	Seminar in Information Systems	1
CSC 205	Computer Science I	3
CSC	Computer Science Electives	12
EGL 211	Technical Writing	3
VCP 144	Web Design I - Design Fundamentals	3

## **COURSE DESCRIPTIONS**

**CSC 103 OPERATING SYSTEMS** introduces the basic concepts of operating systems such as Windows and UNIX. This course provides a comprehensive overview of multiple operating systems commonly found in the Information Technology field today to include the theory behind operating systems. Accordingly, this course will cover the basic functions and design of file systems found in Windows and UNIX operating systems as well as basic network theory and setting up network resources through the multiple versions of software. Special attention will be given to hardware requirements, installation, and file management. 3 credits.

**CSC 106 INTRODUCTION TO PROGRAMMING LOGIC** will take an in depth look at programming concepts and techniques. It will examine theoretical concepts that make the world of programming unique. Also, this course will adopt a practical hands-on approach when examining programming styles. Along with examining different coding, this course will explore the advancement of programming, as well as timeless problem solving strategies. 3 credits.

**CSC 109 INTRODUCTION TO PROGRAMMING** covers core concepts and techniques needed to logically plan and develop computer programs, including object oriented programming and modular design. This course uses the Python programming language. 3 credits Pre-requisite: MAT 097.

**CSC 140 INTRODUCTION TO NETWORKING** provides an introduction to the basic concepts of computer networks and preparation for CompTIA's Network + certification exam. The course covers a broad range of networking-related topics including protocols, topologies, transmission media, and network operating systems as well as the practical skills of network design, maintenance, security, and troubleshooting. 3 credits.

**CSC 182 WEB APPLICATION DEVELOPMENT** covers the core concepts of internet programming, using VBScript and JavaScript, that are needed to bridge the gap between web programming languages and web architecture from both the client and server side. 3 credits

**CSC 203 SEMINAR IN INFORMATION SYSTEMS** is designed to make the student aware of the need to stay current in the field of new technologies by identifying and evaluating new technologies, reading technical journals and literature for current and future trends, and continuing their formal education in the latest technology and trends available. 1 credit.

**CSC 205 COMPUTER SCIENCE I** is an introduction to the basic concepts of an object-oriented programming language such as Java or C++. This course introduces such programming concepts as data types, structures, decision making, looping, functions, arrays, files, and objects. 3 credits. Pre-requisites: CSC 106 and/or CSC 109 or permission of instructor.

**EGL 211 TECHNICAL WRITING** entails the study and practice of written communications in professional settings. In an ongoing workshop, students will be asked to think critically about rhetorical situations; analyze and address case studies; collaborate with team members; research, design, and write effective, ethical texts; develop multiple literacies for multiple audiences; respond constructively to peer writers; present texts through a variety of electronic media; and improve oral presentation and discussion skills. 3 credits. Pre-requisites: EGL 102.

**VCP 144 WEB DESIGN I – DESIGN FUNDAMENTALS** provides an overview of the major design considerations for well-balanced website construction to include the planning cycle, web technologies, usability, site structure, and navigation styles. Emphasis is placed on design issues as each category is explored using HTML, CSS, and basic JavaScript. Students will plan, design, and publish one fixed-width and one responsive website. 3 credits. Pre-requisite: EGL093.

Upon successful completion of this program, students will be able to:

- Analyze problems and develop algorithms
- Design modular software using object oriented programming principles
- Explain the benefits of specific data structures, abstraction, recursion and modular design
- Understand legal and ethical issues associated with computing.
- Create applications in compiled and interpreted programming languages
- Understand the fundamentals of operating systems and networks
- Create technical documentation

Assessment of student achievement of these learning goals is conducted regularly, with a maximum four-year cycle to assess all learning goals. Faculty design measures, evaluate student success, and identify changes that are expected to improve student achievement. Their findings and plans are reported annually in department reports.

In addition to the program requirements outlined above, all Computer Science- Programming students take the following General Education requirements.

General Education Requirements (23 credits)		General Education Code	Credits
CSC 104	Computer Science Fundamentals	I	3
CSC 110	Ethics in Information Technology	I	3
EGL 101	Freshman Composition	E	3
MAT	Math Elective	M	4
SCI	Science Elective with Lab	S/SL	4
SOC SCI	Social Science Elective	SS	3
SPH 121 or SPH 141	Interpersonal Communication or Public Speaking	H	3

**CSC 104 COMPUTER SCIENCE FUNDAMENTALS (I)** is specifically designed as an introductory course for computer, engineering, math and science students to prepare them for the digital world. Readings, research, and activities in this course are designed to help students develop a framework for technology concepts that are applicable to academic research, career preparation, and today's digital lifestyle in these specific fields. 3 credits.

**CSC 110 ETHICS IN INFORMATION TECHNOLOGY** explores the ethical dilemmas that exist where human beings, information objects, and information systems interact. The course introduces students to a variety of ethical situations from historical and cross-cultural perspectives and then explores the relevance to a variety of new and emerging technologies that are inherently social in their construction and use. 3 credits.

**EGL101 FRESHMAN COMPOSITION (E)** teaches students the skills necessary to read college-level texts critically and to write effective, persuasive, thesis-driven essays for various audiences. The majority of writing assignments require students to respond to and synthesize texts (written and visual) through analysis and/or evaluation. Students also learn how to conduct academic research, navigate the library's resources, and cite sources properly. The course emphasizes the revision process by integrating self-evaluation, peer response, small-group collaboration, and individual conferences. Additionally, students are offered guided practice in appropriate style, diction, grammar, and mechanics. Beyond completing multiple readings, students produce a minimum of 7,500 words, approximately 5,000 words of which are finished formal writing in four-five assignments, including a 2,000-word persuasive research essay. 3 credits. Pre-requisites: C or better in COL 081 and EGL 093 or equivalent skills assessment.

**SPH 121 INTERPERSONAL COMMUNICATION** is a survey course covering all facets of human communication. The course emphasizes basic communication skills and awareness of what contributes to effective communicating, as well as what contributes to messages miscommunicated. It also provides students with practice in verbal and listening skills. Students relate communication learning to all areas of life and career skills. Classroom discussions, activities, and experiments on a variety of topics are used as a basis for students' growing awareness of perceptual skills in communication. 3 credits. Co-requisite: EGL 093.

**SPH 141 PUBLIC SPEAKING (H)** is the study of the principles and models of communication in conjunction with hands-on experience in the planning, structuring, and delivery of speeches. Students study and deliver several kinds of public address. The course also provides students with a model for constructive criticism to teach the students what contributes to effective public speaking. 3 credits. Co-requisite: EGL093.

Cecil College does not contract with another institution or non-collegiate organization in providing this program.

## H. Adequacy of articulation

Cecil College has the following articulation agreements for programming majors who wish to pursue a bachelor's degree:

- Kaplan University
- Regis University
- Towson University
- University of Maryland, University College
- Wilmington University (in Delaware)

In addition, transfer agreements with other Maryland colleges and universities allow students to transfer credits into programs with partnering institutions.

## I. Adequacy of faculty resources (as outlined in COMAR 13B.02.03.11).

Faculty Member	Credentials	Status	Courses Taught
James Morgan, Associate Professor of Computer Science	Ph.D. Capella University	Full-time	CSC 103 Operating Systems CSC 104 Computer Science Fundamentals CSC 140 Introduction to Networking
Jacqueline Wilson, Assistant Professor of Computer Science	M.L.A. Harvard University	Full-Time	CSC 109 Introduction to Programming CSC 110 Ethics in Information Technology CSC 182 Web Application Development CSC 203 Seminar in Information Systems CSC 205 Computer Science I
Christopher Gaspare, Assistant Professor of English	M.A. Washington College	Full-time	EGL 101 Freshman Composition EGL 211 Technical Writing
Jonathan Cone	M.F.A. Rochester Institute of Technology	Part-time	VCP 144 Web Design I – Design Fundamentals
Susan Price	M.I.S.T. Wilmington University	Part-time	CSC 106 Introduction to Programming Logic
Patricia D. Richardson	B.A. Michigan State University; Graduate Studies Michigan State University	Part-time	SPH 121 Interpersonal Communication SPH 141 Public Speaking

Faculty have several opportunities for ongoing professional development in pedagogy. Cecil College's instructional technologist offers regular workshops on using technologies to improve both face-to-face and online teaching. In addition, each semester she offers the Quality Matters-based Professional Development for Online Teaching (PDOT) course on best practices in online teaching. The College also funds faculty participation in academic conferences, including conferences focused on pedagogical topics.



In 2019, Cecil College will host the annual conference of the Association of Faculties to Advance Community College Teaching (AFACCT); all full-time and adjunct faculty have been encouraged to attend.

**J. Adequacy of library resources (as outlined in COMAR 13B.02.03.12).**

Cecil College's Cecil County Veterans Memorial (CCVM) Library is a member of Maryland Digital Library and the Maryland Community College Library Consortium. CCVM Library has reciprocal borrowing privileges with the other community college libraries within the State of Maryland.

Students enrolled in Computer Science – Programming can receive a subject-specific library orientation upon faculty request or students can make an appointment to meet one-on-one with the Instructional Librarian for guidance.

The library subscribes to the following relevant databases for Computer Science – Programming: EBSCO's eBook Academic Collection and ProQuest's Computing, ProQuest's Science and ProQuest's Telecommunications.

Instructors have the option to place textbooks and DVDs on Reserve in the library for their courses, or the library can purchase textbooks and DVDs to place on Reserve for student use. The library staff always welcomes and encourages faculty to submit requests for books, multi-media resources, and databases, and Inter-Library Loan to support their instruction throughout the academic year. The library staff strives to honor full-time and part-time faculty requests in a timely manner.

**K. Adequacy of physical facilities, infrastructure and instructional equipment (as outlined in COMAR 13B.02.03.13)**

All students have the opportunity to utilize all physical facilities on campus including the Library; the Arts and Sciences Building; the Engineering and Math Building, Physical Education Complex, and the Technology/Conference Center, housing the computer lab, a student lounge / dining area and a Conference Center.

The department has sufficient dedicated office space for program faculty, staff, and students. Faculty offices include a desk and multiple chairs available for private conferences with students and/or faculty, bookshelves for department resources and a locked file cabinet to secure program materials.

There is also dedicated office space for adjunct faculty. The adjunct offices are equipped with computers, desks, chairs and telephones.

Multiple conference rooms are available for faculty meetings and or private conferences with students in the Engineering and Math Building, the Arts and Science Building, and the Physical Education Complex. Available technology includes state-of-the-art electronic classrooms with interactive white boards, projection systems, immediate capture and documentation cameras, wireless internet access, and the College-wide course management system Blackboard, which can provide on-line learning to supplement courses.

The North East campus computer lab, housed in the Technology Center, provides 28 computers and technology resource staff, during regular lab hours, to assist students. The Writing Center is a free service to all Cecil College students. Tutors are available during a variety of day and evening hours to assist students with reading and writing assignments in any subject. Free subject matter tutoring is also available to all students upon request.

**L. Adequacy of financial resources with documentation (as outlined in COMAR 13B.02.03.14)**

1. Complete [Table 1: Resources \(pdf\)](#) and [Table 2: Expenditure\(pdf\)](#). [Finance data\(pdf\)](#) for the first five years of program implementation are to be entered. Figures should be presented for five years and then totaled by category for each year.

**TABLE 1: RESOURCES**

	<b>Resource Categories</b>	<b>Year 1</b>	<b>Year 2</b>	<b>Year 3</b>	<b>Year 4</b>	<b>Year 5</b>
1.	Reallocated funds	\$0	\$0	\$0	\$0	\$0
2.	Tuition/Fee Revenue (c + g below)	\$107,576	\$116,112	\$125,622	\$134,810	\$146,060
a.	Number of F/T students	8	8	9	9	10
b.	Annualized Tuition/Fee Rate <sup>2</sup>	\$3,927	\$4,059	\$4,158	\$4,290	\$4,422
c.	Total F/T Revenue (a x b)	\$31,416	\$32,472	\$37,422	\$38,610	\$44,220
d.	Number of P/T students	32	34	35	37	38
e.	Credit Hour Rate	\$119	\$123	\$126	\$130	\$134
f.	Annualized Credit Hour Rate <sup>3</sup>	\$2,380	\$2,460	\$2,520	\$2,600	\$2,680
g.	Total P/T Revenue (d x e x f)	\$76,160	\$83,640	\$88,200	\$96,200	\$101,840
3.	Grants, Contracts & other External Sources	\$0	\$0	\$0	\$0	\$0
4.	Other Sources	\$13,232	\$13,852	\$14,576	\$15,196	\$15,920
	<b>Total (add 1-4)</b>	<b>\$120,808</b>	<b>\$129,964</b>	<b>\$140,198</b>	<b>\$150,006</b>	<b>\$161,980</b>

Given current enrollments in Programming Option of our Computer Information Systems degree, we anticipate that we will enroll about 40 students in year 1, followed by modest growth in the program. Approximately 80 percent of Cecil's students are part-time students and 20 percent are full-time students; our projected total enrollment has been allocated on this ratio.

We are projecting tuition increases of 3% each year. Other sources of revenue include Student Development fees (\$8/credit) and Registration fees (\$75/semester). On average, full-time Cecil students take 33 credits per year; part-time students average 20 credits per year.

**TABLE 2: EXPENDITURES**

	<b>Expenditure Categories</b>	<b>Year 1</b>	<b>Year 2</b>	<b>Year 3</b>	<b>Year 4</b>	<b>Year 5</b>
1.	Faculty (b + c below)	\$75,759	\$77,131	\$78,476	\$79,846	\$81,242
a.	# FTE	.9	.9	.9	.9	.9
b.	Total Salary	\$49,500	\$50,242	\$50,996	\$51,761	\$52,538
c.	Total Benefits	\$26,259	\$26,889	\$27,480	\$28,085	\$28,704
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

<sup>2</sup> Assumes Cecil County resident taking 33 credits per year.

<sup>3</sup> Assumes Cecil County resident taking 20 credits per year.

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
	<b>Total (Add 1-7)</b>	<b>\$75,759</b>	<b>\$77,131</b>	<b>\$78,476</b>	<b>\$79,846</b>	<b>\$81,242</b>

This program will be implemented with existing faculty resources and administrative staff, so there are no new expenses for personnel. The faculty FTE for programming was determined based on the degree-seeking status of our current programming students: 90% of our programming students are seeking the degree, while the other 10% are seeking the certificate. Therefore, 90% of the College's one full-time programming faculty member will be devoted to instruction and support of AAS Programming students.

Salaries are forecasted to increase 1.5% each year, while health benefits are forecast to increase 2.5% each year. Library resources and equipment are budgeted within the general operating budget on an ongoing basis.

**M. Adequacy of provisions for evaluation of program (as outlined in COMAR 13B.02.03.15).**

Faculty members are evaluated every semester by students enrolled in their courses. The College uses an electronic survey process (Evaluation Kit) and students are required to complete the evaluation within a specified time frame at the end of the semester or they are locked out of the learning management system (Blackboard) until they complete the survey. This has resulted in a very high response rate for all courses. In addition, faculty members are assessed in the classroom by the appropriate Dean or designee each semester for their first year at Cecil College, annually for the next two years, and every three years thereafter. Student course evaluations are an important component in the College's process of monitoring student satisfaction.

All faculty members are contractually obligated to complete an annual report that includes assessment results. Faculty satisfaction is monitored through the Great Colleges to Work For Survey, which is administered every two years.

The College's Assessment Plan requires that each learning goal for an academic program be reviewed at least once every four years. These assessments are used to make improvements to the program. In addition, the College has an established Comprehensive Program Review process through which programs evaluate their strengths, opportunities, and cost effectiveness every eight years.

Student retention rates are regularly monitored by the division dean.

**N. Consistency with the State's minority student achievement goals (as outlined in COMAR 13B.02.03.05 and in the State Plan for Postsecondary Education).**

Cecil College embraces the value of diversity, and strives to continuously foster inclusiveness, and has identified "college-level competency in awareness of ...cultural diversity..." as one of the institution's 7 General Education learning goals.

**O. Relationship to low productivity programs identified by the Commission:**

Not applicable.

**P. Adequacy of distance education programs under COMPAR 13B.02.03.22.**

Not applicable.