



MHEC
Creating a state of achievement

Office Use Only: PP#

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

Institution Submitting Proposal

Frederick Community College

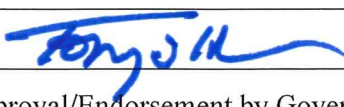
Each action below requires a separate proposal and cover sheet.

- | | |
|--|---|
| <input type="radio"/> New Academic Program | <input type="radio"/> Substantial Change to a Degree Program |
| <input checked="" type="radio"/> New Area of Concentration | <input type="radio"/> Substantial Change to an Area of Concentration |
| <input type="radio"/> New Degree Level Approval | <input type="radio"/> Substantial Change to a Certificate Program |
| <input type="radio"/> New Stand-Alone Certificate | <input type="radio"/> Cooperative Degree Program |
| <input type="radio"/> Off Campus Program | <input type="radio"/> Offer Program at Regional Higher Education Center |

Payment ☒ Yes
Submitted: ☐ No

Payment ☐ R*STARS
Type: ☒ Check

Date Submitted: 2/11/2019

Department Proposing Program	Computing and Business Technology		
Degree Level and Degree Type	Area of Concentration within A.A.S. degree		
Title of Proposed Program	Computer Aided Design (Engineering) Technology		
Total Number of Credits	60		
Suggested Codes	HEGIS: 5303.01	CIP: 15.1302	
Program Modality	<input type="radio"/> On-campus <input type="radio"/> Distance Education (fully online) <input checked="" type="radio"/> Both		
Program Resources	<input checked="" type="radio"/> Using Existing Resources <input type="radio"/> Requiring New Resources		
Projected Implementation Date	<input type="radio"/> Fall <input type="radio"/> Spring <input checked="" type="radio"/> Summer Year: 2019		
Provide Link to Most Recent Academic Catalog	URL: https://www.frederick.edu/class-schedules/catalogs/fcc-catalog.aspx		
Preferred Contact for this Proposal	Name:	Erin Peterson	
	Title:	Assistant Dean, Curriculum Systems and Scheduling	
	Phone:	(301) 846-2651	
	Email:	epeterson@frederick.edu	
President/Chief Executive	Type Name:	Tony Hawkins	
	Signature:	 Date: 2/13/19	
	Date of Approval/Endorsement by Governing Board:	01/16/2019	

Revised 6/13/18



January 17, 2019

Dr. James D. Fielder
Secretary of Higher Education
Maryland Higher Education Commission
6 N. Liberty St.
Baltimore, MD 21201

Dear Dr. Fielder,

Frederick Community College (FCC) is requesting MHEC approval of the following new area of concentration within an existing degree program:

Existing Degree Program: STEM Technology A.A.S.

New Proposed Area of Concentration: Computer Aided Design (Engineering) Technology

The proposed Computer Aided Design (Engineering) Technology Area of Concentration within the existing A.A.S in STEM Technology is designed to prepare students for STEM careers in the Computer Aided Design and Engineering disciplines. This career pathway creates a robust pipeline into rewarding STEM careers and allows the student to be identified as an AAS STEM major with an AOC. The AOC is an appealing curriculum option that will provide students with specialized training leading them to successful careers as technicians, drafters, and architects.

At this time, FCC would also ask that the proposed Area of Concentration in Computer Aided Design (Engineering) Technology be added to MSDE's List A.

A check for administrative costs in the amount of **\$250** is enclosed. The program proposal with a copy of this letter will be transmitted electronically to MHEC.

Thank you for your consideration of this proposal. If you have any questions regarding FCC's request for approval, please do not hesitate to call me at 301-846-2491.

Sincerely,

A handwritten signature in blue ink, appearing to read "Tony D. Hawkins", is written over a horizontal line.

Dr. Tony D. Hawkins
Provost/Executive Vice President for Academic Affairs, Continuing Education, and Workforce Development
thawkins@frederick.edu

pc: Erin Peterson, FCC (epeterson@frederick.edu)
Renee Davis, FCC (rdavis@frederick.edu)

MHEC Academic Program Proposal

Frederick Community College

Computer Aided Design (Engineering) Technology Area of Concentration within the A.A.S. in STEM Technology

A. Centrality to Institutional Mission and Planning Priorities:

1. Provide a description of the program, including each area of concentration (if applicable), and how it relates to the institution's approved mission.

The proposed Computer Aided Design (Engineering) Technology Area of Concentration within the existing Associate of Applied Science in STEM Technology degree is designed to prepare students for STEM careers in the Computer Aided Design and Engineering disciplines. This career pathway creates a robust pipeline into rewarding STEM careers and allows the student to be identified as an AAS STEM major with an AOC. The AOC is an appealing curriculum option that will provide students with specialized training leading them to careers as technicians. There are various certifications the student is able to complete within each AOC. Today, technicians are working with a wide variety of emerging technologies, such as photonics; nanotechnology; biotechnology; information and communication technology; advanced manufacturing; gaming, audio production, environmental monitoring; biomedical equipment; and nuclear, solar, wind, and other alternative energy fields, to name a few. This new CAD Engineering focused pathway will be added to the previously approved Area of concentrations listed below.

Previously Approved Areas of Concentration

Audio Production Technology
Computer Aided Design Technology
Construction Management Technology
Cybersecurity
Data Science
Information Technology Specialist
Network Engineering
Software Engineering

[Please note: in order to further distinguish between the existing Computer Aided Design Technology Area of Concentration and this proposed new Computer Aided Design (Engineering) Technology Area of Concentration, the College has plans to revise the existing Computer Aided Design Technology AOC program and title to highlight its Architectural focus, while this new Computer Aided Design (Engineering) Technology AOC has an Engineering focus.]

Our challenge as a college is to help students to identify a variety of career areas of concentration. These specific areas will prepare students for a career. The areas of concentration connect challenging academics with real world skills, allowing students to understand what they need to know and why they need to know it. They will show progress in student achievement in academics as well as communications, critical thinking, and problem-solving.

This proposed program directly supports the mission of Frederick Community College by helping students to meet their career goals. The program is designed to reduce the time-to-degree for students who typically select the General Studies major by enabling students who

are interested in STEM fields (but perhaps not sure which specific discipline) to start on a more focused curricular pathway their first semester on campus. This program is also designed to support students who desired STEM, however the focused career major is not directly represented by one of FCC's approved AAS degrees.

2. Explain how the proposed program supports the institution's strategic goals and provide evidence that affirms it is an institutional priority.

The new CAD (Engineering) Technology AOC aligns with the following FCC 2020 Strategic Goals (and are evidenced as follows):

- 1) Enhance student persistence, success, and completion through collaborative and effective support systems – students in an area of concentration will have a focused curriculum to follow rather than a suggested pathway. This will reduce the likelihood that students register for coursework that is not necessary to graduate.
- 2) Increase access, affordability, and student goal completion – research shows that students are more likely to graduate when their program of study is focused;
- 3) Promote excellence in the design, delivery, and support of student learning – targeted advising, co-curricular events around the broad majors, and more will create communities of learners.

3. Provide a description of the institution's commitment to:

a) ongoing administrative, financial, and technical support of the proposed program

The proposed program is an Area of Concentration under the Associate of Applied Science STEM Technology degree. The current Program Manager reports to the Department Chair of Computing and Business Technology who provides oversight, leadership, and support to the Associate Vice President for Academic Affairs & Dean of Career Programs. The Program Manager leads the development of program specific curriculum and courses, procurement of programmatic equipment and supplies, and will actively contribute to the ongoing administrative, financial, and technical support of the proposed program.

b) continuation of the program for a period of time sufficient to allow enrolled students to complete the program.

FCC is committed to the success of all students and will anticipate the continuation of this proposed program beyond the time needed for students to complete the program. The College offers a variety of academic support programs to include tutoring, success funding, and other retention initiatives. Students have access to program specific advisors, faculty, and staff dedicated to student success.

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

Frederick Community College's Computer Aided Design program is aligned with industry standards. However, there is renewed focus on course offering evaluations to ensure that we are up-to-date with the current workforce trends to provide students with the most relevant curriculum and relatable workforce skills. The proposed program responds to the workforce needs of the local community and will develop graduates with critical and analytical thinking,

problem solving, and effective communication skills embedded in a focused pathway. The inclusion of focused pathways support Strategy 6 of the 2017-2021 Maryland State Plan to “improve the student experience by providing better options and services that are designed to facilitate prompt completion of degree requirements”. These activities provide evidence of the perceived need for the proposed program and are consistent with the Maryland State Plan for Postsecondary Education.

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

1. Describe potential industry or industries, employment opportunities, and expected level of entry (*ex: mid-level management*) for graduates of the proposed program.

Computer Aided Design and drafting is used for creating visual and spatial information in architectural, mechanical, structural, construction, manufacturing, and other fields. CAD designers are also referred to as drafters who are skilled at creating computerized drawings. CAD programs provide students with skills that can be used in many areas, from working with architecture firms that design housing and office buildings to government agencies that specialize in urban development; students may be able to work in many developmental environments and engineering focused capacities. The CAD (Engineering) Technology area of concentration will provide training and education for students who successfully complete the program to be qualified for work as an entry-level architectural CAD drafter, designer, operator, or technician.

2. Present data and analysis projecting market demand and the availability of openings in a job market to be served by the new program.

The outlook for the local job market suggests abundant employment opportunities for students upon successful program completion. The U.S. Bureau of Labor Statistics (BLS) projected employment of drafters to grow 7 percent from 2016 to 2026, about as fast as the average for all occupations. Increased construction activity is projected to drive demand for drafters, but this is expected to be tempered as engineers and architects increasingly perform some tasks previously done by drafters.

Drafters	
<i>Source: U.S. Bureau of Labor and Statistics</i>	
2016 Median Pay	\$53,480 per year \$25.71 per hour
Typical Entry-Level Education	Associate's degree
Work Experience in a Related Occupation	None
On-the-job Training	None
Number of Jobs, 2016	207,700
Job Outlook, 2016-26	7% (As fast as average)
Employment Change, 2016-26	14,500

Employment Outlook

Occupational Title	Employment, 2016	Projected Employment, 2026	Change 2016-2026	
			Percent	Numeric
Drafters	207,700	222,200	7	14,500

Architectural and Civil Engineering Drafters	99,600	107,700	8	8,000
Electrical and Electronics Drafters	27,400	29,200	7	1,800
Mechanical Drafters	64,800	68,100	5	3,300
Drafters, all others	15,900	17,200	8	1,300

SOURCE: U.S. Bureau of Labor Statistics, Employment Projections program

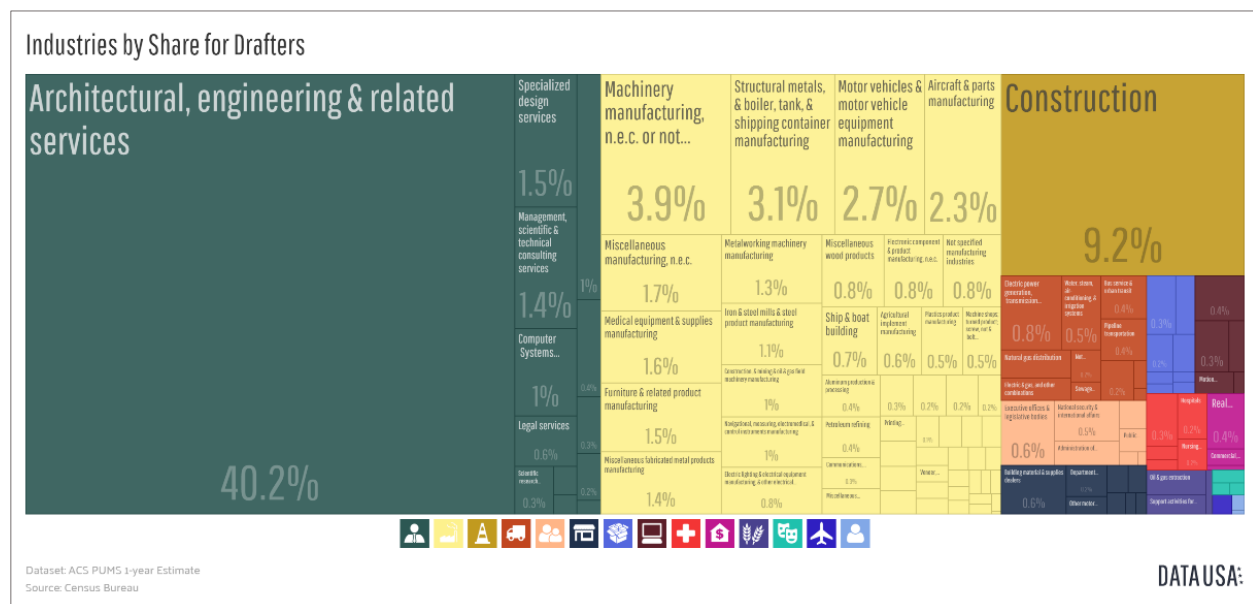
Most Common Industries

Most common industries include Architectural, engineering & related services; Construction; and Machinery manufacturing. The Washington-Arlington-Alexandria, DC-VA-MD-WV Metropolitan Division features one of the highest employment levels in this occupation, and Maryland is among the top highest paying states for this occupation.

(<https://www.bls.gov/oes/current/oes173011.htm#st>)

In Frederick County, Maryland, key selected specialized or high employment subsectors within the manufacturing sector, by major subsector, include the following:

- **Pharmaceuticals Manufacturing:** Key employers—AstraZeneca and Lonza; Pharmaceutical and medicine manufacturing—872 jobs;
- **Construction Materials and Products:** Key employers—CanamSteel and NVR Building Products; Plywood and engineered wood product manufacturing—LQ of 2.13 and 114 jobs; Architectural and structural metals manufacturing—473 jobs;
- **Printing:** Key employers—RR Donnelley and Navistar Direct Marketing; Printing and related support activities 475 jobs;
- **Machinery and Equipment:** Key employers—STULZ Air Technology Systems, Wright Manufacturing, and EDCO; Lawn and garden equipment manufacturing—112 jobs; Air conditioning, refrigeration, and forced air heating—287 jobs; Construction machinery manufacturing 137 jobs;
- **Food Processing** (included in the value-added agriculture cluster): Key employers—Bimbo Bakeries, Dairy Maid Dairy, Flying Dog Brewery; Dairy product manufacturing—159 jobs; Bakeries and tortilla manufacturing—333 jobs; and Beverage manufacturing—245 jobs.

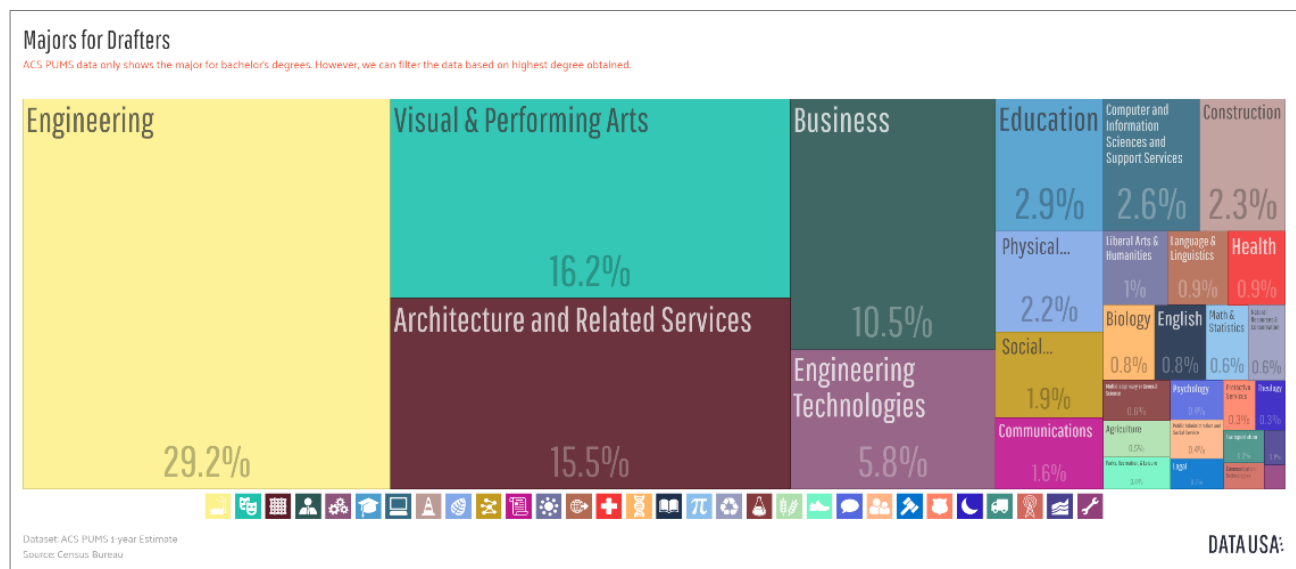


3. Discuss and provide evidence of market surveys that clearly provide quantifiable and reliable data on the educational and training needs and the anticipated number of vacancies expected over the next 5 years.

The Frederick market is brimming with available employment that would require CAD Engineering Technology education and training. Evidence of the program's need is indicated by the rising rates of population growth, industry growth, strength of local industry, strength of local economy, geographic proximity to bordering counties, and demographic-alignment with the local population. The outlook for the local job market suggests abundant employment opportunities upon successful program completion which support educational and training needs and anticipated vacancies.

Most Common Education Majors

Most common education majors include Engineering, Visual & Performing Arts, Architecture, Business and Engineering Technologies programs. FCC maintains academic pathways for the top education majors that result in industry employment.



WORKFORCE AND OCCUPATION

Total national workforce: 155,072

Average age: 42

Job Growth

Estimated: 6%-7%; National Average: 7%

MARKET ASSESSMENT: INDUSTRY GROWTH

These professions observe a 7% national projected growth for jobs, slightly lower than the national 7% average. An 8%+ growth rate is expected within the state of Maryland.

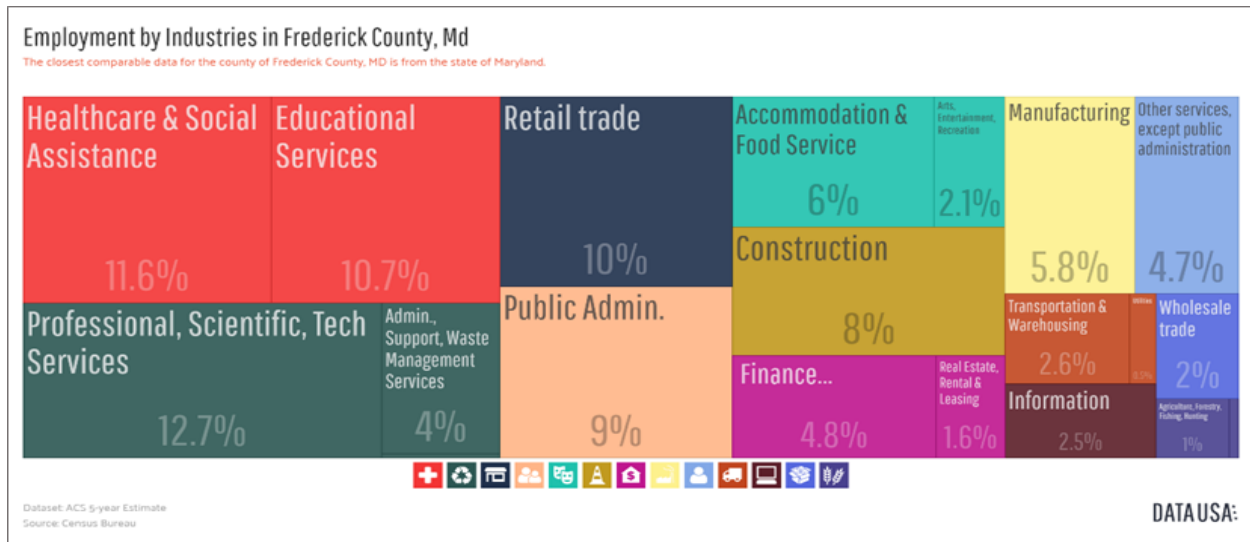
State	Employment		Percent Change	Projected Annual Job Openings*
	2016	2026		
Maryland	1,130	1,220	+8%	110

Source: www.careeronestop.org

MARKET ASSESSMENT

EMPLOYMENT: Frederick County, MD

The Scientific and Tech Services industry employs the greatest number of people (12.7%) in Frederick County, MD, while the construction and manufacturing industries employ an additional 14% of the population. With the projected population growth and the [Economic Development Strategy for Frederick County, Maryland](#) that supports growth in these industries, the market is prime to have ample job opportunities for credentialed CAD engineers.



4. Provide data showing the current and projected supply of prospective graduates.

In 2016, there were 599 female graduates (55%) and 481 male graduates (45%) of FCC. Graduation rates by gender are well-aligned with employment by gender in the professions; 70% female, 30% male. The projected supply of prospective graduates of students at FCC for the proposed program of study are as follows:

	1 st Fall Semester	2 nd Fall Semester	3 rd Fall Semester	4 th Fall Semester	5 th Semester
Graduates	20	30	45	55	60

The institution expects similar enrollments in the proposed program related to those in the current CAD programs. The CAD program currently has 34 declared majors, with an average of 24 full-time students and 10 part-time students. Calculations utilize current tuition and fees and project a 1% increase each year. The average number of credits taken per year by part-time students is 12.

D. Reasonableness of Program Duplication:

1. Identify similar programs in the State and/or same geographical area. Discuss similarities and differences between the proposed program and others in the same degree to be awarded.

An analysis of other Maryland community colleges shows various similarities and differences between those institutions and the Computer Aided Design (CAD) program we offer at FCC. The notable similarities were related to the Computer Aided Design courses and content

offered from the other colleges' reviewed. FCC's programs have a strong focus on CAD coursework that seamlessly link the academic rigor to workforce standard knowledge and skills. The CAD program content teaches students the foundations, as each course builds upon each other in the sequence.

Similarly, to the other Maryland institutions, Frederick Community College offers various architectural courses that enhance the quality of our degree and certificate programs. There were few differentiations noted related to courses between the institutions whereas, some colleges with the CAD program highlight coursework that is specifically focused on mechanical, engineering, building technology, and construction courses. The proposed program would allow us to bridge the gap in workforce skills by offering the students pathways to CAD program with engineering, architectural, and mechanical focus.

Maryland Community Colleges	AAS	Certificates	Number of Credits (Certificates)	Other Notes
Frederick Community College	Computer Aided Design Technology	Architectural Computer Aided Design Computer Aided Design Operator	20 18	Infuses Construction management courses into the curriculum.
Montgomery College	Architectural Technology, Track, Architectural/Construction Technology	CAD for Building Professionals	31	AAS & Certificates: Architectural CAD focused courses with Construction course, building and technology immersion included. The Certificate programs courses have 7 required courses with 4 of the 7 courses offered for 4 credits. Courses Differences: Architectural History, Building Technology & Documentation, Professional practicum
Community College of Baltimore County	Computer Aided Design for Architecture and Engineering	AutoCAD Operator CAD Architecture	15 15	Architectural CAD and Engineering focused courses with a Construction course added.

				<p>CAD Operator certificate requires an engineering course.</p> <p>Courses Differences: Technical Animation, Intro to Geographic Information Systems (GIS). CAD Management.</p>
Carroll Community College	Computer Aided Design Architect Civil Track	Architectural Track	41	<p>The AAS degree are comparable to FCC. The AAS degrees are divided into an Architectural and Mechanical track.</p> <p>Course Differences noted were Solid Modeling and Mechanical Application of Solid Modeling Software and engineering drawing courses.</p> <p>The certificate programs are comparable to FCC certificate programs with the exception that the Certificate programs at Carroll require students to complete an internship and the certificates are divided into an Architectural and Mechanical track.</p>
	Computer Aided Design Architect Mechanical Track	Mechanical Track	41	
College of Southern Maryland	Engineering Technology	Drafting Certificate	28	<p>There is no official dedicated CAD program. The Engineering Technology AAS degree has a concentration in drafting where students are able to take CAD courses with their engineering degree.</p> <p>The drafting certificate is composed of</p>
		CAD	Non-credit courses	

				<p>engineering and CAD courses using the Solid works software that is also offered in the Continuing Education program.</p> <p>Course Differences noted were Engineering Graphics, CAD/CAM Manufacturing & Technology and 3D CAD with Solid works</p>
Hagerstown Community College	Computer-Aided Design Concentration, Mechanical Engineering Technology	Computer-Aided Design with Architectural pathway or Mechanical Pathway	18	This AAS degree program is comparable to FCC CAD course offerings. The program is CAD focused with a few Architecture and courses offered.
		Letter of Recognition	9	<p>The certificate program has two pathways Architectural and Mechanical</p> <p>Course Differences noted were Solid Modeling or Architectural course and Intro to CNC Programming.</p>
Hartford Community College	Computer Aided Design and Drafting (CADD)	Computer Aided Design and Drafting (CADD)	12	<p>Architectural CAD and Engineering focused courses.</p> <p>The certificate program is comparable to FCC's CAD offerings. Course difference noted were Solid modeling, Solid works, Intro to engineering and Geometric dimensioning and tolerance.</p>

2. Provide justification for the proposed program.

Accountability: The proposed degree program will make it less likely that a student takes a course simply to fulfill the requirements of the community college, and more likely that a student takes a course because it will transfer to a baccalaureate institution.

Flexibility: The proposed degree program will enable students to prepare to transfer in STEM degree programs that may change in response to the job market, societal needs, technology, or other factors. Examples of programs at UMBC and College Park to which students might transfer with a STEM degree include, but are not limited to: dentistry, medicine, pharmacy, and physical therapy.

Access: The proposed degree program will help account for the particular needs of first-generation and first-time college students by allowing them the opportunity to earn a degree in STEM as they explore the varying disciplines to narrow a transfer focus. Targeted advising, including expanded opportunities for students to explore new disciplines, will allow students without exposure to career opportunities to more clearly understand their options.

Time-to-degree: The proposed degree will reduce time-to-degree for students who may have typically chosen an open-ended General Studies degree by helping them to choose a discipline for transfer earlier during their time at the college.

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

1. Discuss the program's potential impact on the implementation or maintenance of high-demand programs at HBI's.

The proposed program is expected to have no impact on HBIs in Maryland as there is no program duplication.

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

1. Discuss the program's potential impact on the uniqueness and institutional identities and missions of HBIs.

The proposed program is expected to have no impact on the uniqueness and institutional identities and mission of HBIs in Maryland.

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

1. Describe how the proposed program was established, and also describe the faculty who will oversee the program.

The current CAD program faculty, staff, educational professionals, current and alumni students and industry partners, and community members informed the decision to put forward the proposed program. The Program Advisory Committee meets twice per year to review curriculum, and advise the faculty on trends that could be used to inform the program. The committee plays an active role in informing the CAD program by reviewing the curriculum, providing feedback on employment opportunities, and providing advice on industry trends. The Computer Aided Design program does not have any external accreditation standards. The program has discipline specific adjunct faculty who will teach the CAD and Engineering courses.

2. Describe educational objectives and learning outcomes appropriate to the rigor, breadth, and (modality) of the program.

The tiered program structure allows students to build skills at each milestone, and how the major knowledge groups relate to each tier. During the recent curriculum updates for the CAD program, each program-learning outcome was reviewed for accuracy, measurability, and validity. The Computer Aided Design program learning outcomes are mapped to the core learning outcomes of each course and assessment of student learning is conducted through discussion questions, in-class activities, assignments/projects, portfolio creation, and written & practical exams. Rubrics are used where appropriate to determine student success results in alignment with the core learning outcomes.

3. Explain how the institution will:

a) provide for assessment of student achievement of learning outcomes in the program

The College assesses the effectiveness of its academic programs using a well-structured, five-year program review process. The process consists of an analysis of program mission, goals, and objectives; an assessment of the program according to internal and external data; an assessment of the curriculum; an assessment of student learning outcomes; an assessment of program resources and viability; a summary of key findings and recommendations; a review by two external reviewers; and the submission of a formal action plan. The action plan then serves as the foundation for improvements made to the program over the next four years. In addition to program review, the College also assesses its general education competencies at the course-level. Academic departments designate a high-enrollment general education course or courses that require general education competencies to undergo a three-year cycle of assessment. These projects are identified during the first semester of the three-year cycle and faculty are required to select three of the general education competencies and one of the following competencies (critical thinking, quantitative/scientific reasoning, oral/written communication, and technological competence). These competencies are required to be assessed by MHEC and MSCHE. The process begins with the development of an assessment plan, then proceeds to a pilot assessment collection, followed by three consecutive semesters of assessment collection, and the completion of a final course level assessment report.

b) document student achievement of learning outcomes in the program.

Programs collect documents from individual courses in an effort to record student achievement of learning outcomes based on the established assessment cycle. The documents collected are evaluated to determine the level of student achievement that has occurred based on the learning outcomes. Data will be analyzed, and updates will be made as deemed appropriate.

4. Provide a list of courses with title, semester credit hours and course descriptions, along with a description of program requirements.

The courses listed below are required for completion of the Computer Aided Design (Engineering) Technology Area of Concentration within the A.A.S in STEM Technology degree. Course descriptions and semester credit hours are included as well. Students will be required to earn 60 total credits for completion of the proposed program.

Program Requirements:

General Education Requirements: 22 credits

English

ENGL 101 – English Composition (3 credits)

Mathematics

MATH 165 – Precalculus (4 credits)

Social & Behavioral Sciences

Social & Behavioral Sciences (Gen Ed course list) (HUMS 102-Human Relations recommended, satisfies Cultural Competence requirement) (3 credits)

Arts & Humanities

Arts Elective (Gen Ed course list) (3 credits)

Humanities Elective (Gen Ed course list) (PHIL 208-Business Ethics recommended) (3 credits)

Communications Elective (Gen Ed course list) (COMM 107-Career Communication recommended) (3 credits)

Biological & Physical Sciences

Biological & Physical Sciences (Gen Ed course list) (PHYS 101 or PHSC 101 or PHSC 121 recommended) (3 credits)

PE/Health & Nutrition Requirement: 1 credit

(**Cultural Competence Requirement:** All degree seeking students must complete a cultural competence requirement in order to graduate. This course may satisfy another requirement in the program. Recommended course HUMS 102 satisfies requirement.)

Departmental Requirements: 24 credits

CMTE 100 – Occupational Safety & Health (2 credits)

CADT 101 – AutoCAD I (3 credits)

CADT 102 – AutoCAD II (3 credits)

CADT 110 – Introduction to SolidWorks (3 credits)

CADT 250 – Statics and Strength of Materials (4 credits)

CADT 255 – Dynamics (4 credits)

CMIS 105 – Introduction to Programming (2 credits)

ENGR 100 – Introduction to Engineering Design (3 credits)

Electives: 13 credits

Any CADT, CMIS, CMTE, MATH, ENGR, SPAN, or GISA course or INTR 103 (Internship)

Total credits: 60

Course Descriptions:

ENGL 101 – English Composition (3)

(formerly EN 101)

Develops students' ability to use writing, reading, research, and thinking processes to create documented essays that demonstrate the conventions of academic writing.

MATH 165 – Precalculus (4)

(formerly MA 111)

Includes topics from college algebra and trigonometry with a graphing approach such as right triangle trigonometry, circular trigonometric functions, inverse trigonometric functions, exponential functions, power functions, logarithmic functions, and polynomial functions and their zeros.

HUMS 102 – Human Relations (3)

(formerly HS 102)

Introduces students to the fundamentals of interpersonal communication and examines such communication in the context of culture, ethnicity, gender, age, and race in particular. As an experiential course, it seeks to increase the skills and sensitivity necessary for successful human relationships in a diverse global, national and local community. The impact of the increasing use of interactive technologies is also examined.

PHIL 208 – Business Ethics (3)

(formerly PH 208)

Explores the application of ethical theories and principles to specific situations addressed in the fields of business, advertising, marketing, and economics.

COMM 107 – Career Communication (3)

(formerly CMSP 107)

Offers students knowledge and skills needed to communicate within their prospective professions and with others outside those professions. Assignments in interview, group discussion and extemporaneous speaking are adapted to individual students.

PHYS 101 – Survey of Physics (3)

(formerly PY 101)

Presents a survey of physics. Topics include mechanics, energy, thermodynamics, waves, sound, electricity and magnetism, optics, and modern physics.

PHSC 101 – Survey of Physical Science (3)

(formerly PC 103)

Covers selected aspects of earth science, physics, chemistry, and the quantitative relationships involved in the behavior of matter. Uses simple experiments to introduce scientific topics as needed. Restricted to non-science majors. Students cannot receive credit for both (PHSC 101 or PC 103) and (PHSC 111 or PC 114).

PHSC 121 – Physical Geology (4)

(formerly PC 109)

Introduces the physical and chemical processes that occur along the surface of the earth and within the earth's interior. Topics include plate tectonics, earthquakes, volcanoes, rocks and minerals, geologic maps, and the origin and continual modification of surface features. Meets the requirement for a general education science lab course.

CMTE 100 – Occupational Safety & Health (2)

Identifies factors and practices that aid in accident prevention and elimination of hazards in the workplace. Topics will include liability, standards, OSHA, hazard control, accident investigation, and safety management.

CADT 101 – AutoCAD I (3)

(formerly CAD 101)

Introduces AutoCAD software and its application as a drawing tool. Students will utilize basic AutoCAD commands to create two-dimensional production and architectural drawings. Students will use templates, layer control, dimensioning, editing, text, symbol creation, and blocks to create and modify geometrical designs and print/plot drawings for presentation.

CADT 102 – AutoCAD II (3)

(formerly CAD 102)

Extends and integrates the study of AutoCAD at an intermediate level. Students will create pictorial views and three-dimensional drawings. Students will gain an understanding of three-dimensional coordinates; create and work with composite, mesh, and solid models; manipulate materials in AutoCAD; and use cameras, walkthroughs, and flybys to view models.

CADT 110 – Introduction to SolidWorks (3)

Introduces solid modeling software and its application as a design/drawing tool. Content covers basic features used to create, edit, document, and print parts and assemblies. Students will be able to create 3D models from which tangible counterparts could be created. Students will gain an understanding of important geometric constraints such as perpendicularity, concentricity, symmetry, angularity, parallelism, and others, that help them make appropriate design decisions on specific models as well as in assemblies.

CADT 250 – Statics and Strength of Materials (4)

Covers the basic principles of statics, forces, force systems, loading, and load effects. Analyzes the mechanics of materials including center of gravity, moment of inertia, radius of gyration, and the concepts of stresses and strains as they relate to Computer Aided Design and Technology.

CADT 255 – Dynamics (4)

Includes the dynamics of particles and rigid bodies, the impulse-momentum method, and the work-energy principle to solve dynamic problems as it relates to mechanical design, the path of projectiles, and the design of highways.

CMIS 105 – Introduction to Programming (2)

(formerly CIS 107)

Introduces programming and is aimed at students with no prior programming knowledge or skills. Covers basics of programming including variables, decision-making statements, and iterative statements. Students create logical solutions to novel problems using tools such as pseudocode and flowchart. Students write, test, and run elementary programs to solve problems using a high-level programming language.

ENGR 100 – Introduction to Engineering Design (3)

(formerly EG 100)

Develops basic concepts of engineering approaches to problem solving and the skills for the design and timely fabrication of the designed product.

5. Discuss how general education requirements will be met, if applicable.

Skills needed for the Computer Aided Design (Engineering) Technology program are well-aligned with FCC General Education requirements. FCC's General Education courses reinforce

that prospective students are provided the core skills needed for success. General Education is the foundation of the higher education curriculum providing a coherent intellectual experience for all students. The Frederick Community College General Education CORE is designed to introduce graduates to the fundamental knowledge, skills, and values which are essential to the study of academic disciplines, to the pursuit of life-long learning, and to the development of educated members of the community and world.

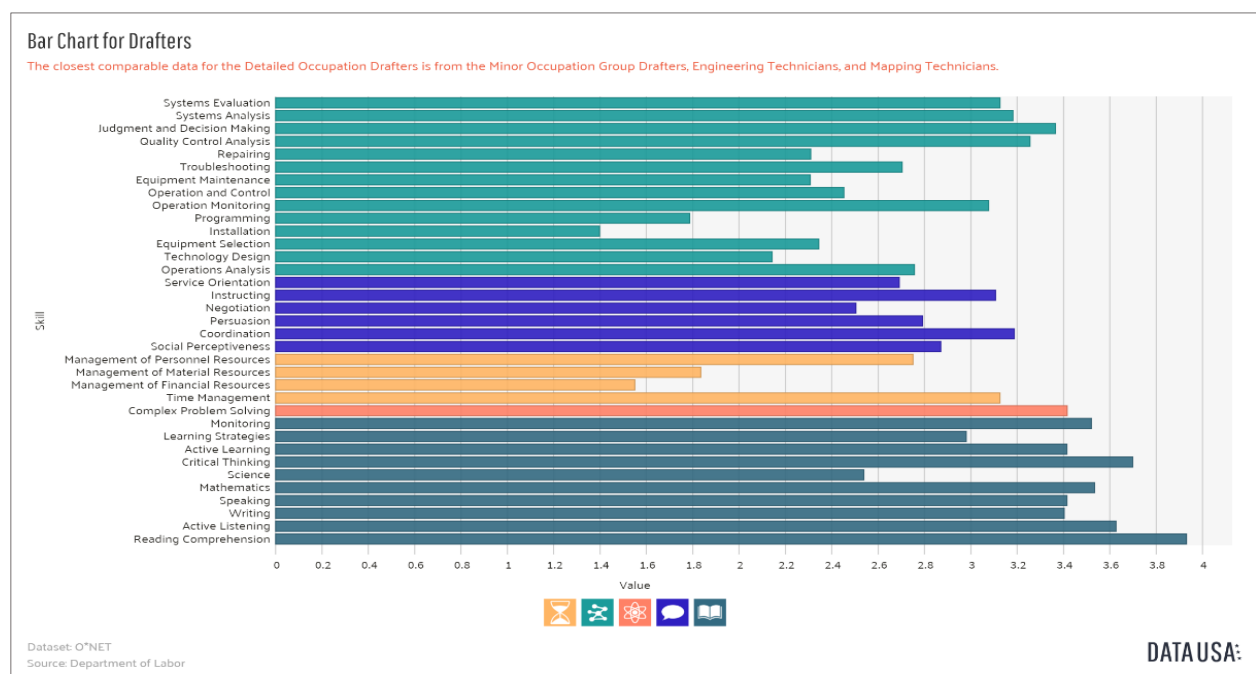
The General Education CORE includes ten general education goals:

- Students will demonstrate college-level communication skills.
- Students will demonstrate critical thinking skills.
- Students will demonstrate the capacity for systems thinking about ways in which individuals, groups, institutions, and societies interrelate.
- Students will demonstrate quantitative problem solving.
- Students will apply scientific reasoning.
- Students will demonstrate technological competence.
- Students will interpret and apply academic, professional, and civic ethics.
- Students will be able to make informed critical thinking responses to the visual, performing, and literary arts and the human values expressed in all art forms.
- Students will evaluate personal wellness to make critically informed lifestyle choices reflecting understanding of wellness.
- Students will demonstrate cultural competence.

This process allows the College to ensure that students are meeting their goals and ensures the College is meeting compliance standards which require an accredited institution to possess clearly stated educational goals, organized and systematic assessment, consideration and use of results, and periodic assessment of the effectiveness of the assessment process.

Core Skills Needed

Reading comprehension, critical thinking, speaking, judgment, and decision making as well as active listening, interpersonal, math, technical, and time-management, other; Skills needed for CAD Drafters are well-aligned with FCC General Education requirements.



6. Identify any specialized accreditation or graduate certification requirements for this program and its students.

The proposed program does not have any specialized accreditation or graduate certification requirements for its students.

7. If contracting with another institution or non-collegiate organization, provide a copy of the written contract.

No contracts exist between other institutions or non-collegiate organizations related to the proposed program.

8. Provide assurance and any appropriate evidence that the proposed program will provide students with clear, complete, and timely information on the curriculum, course and degree requirements, nature of faculty/student interaction, assumptions about technology competence and skills, technical equipment requirements, learning management system, availability of academic support services and financial aid resources, and costs and payment policies.

Communication at the program and institutional level is accomplished through publication on the College website, through brochures, and the College catalogue. The College will provide identical resources to students in the proposed program that other programs offered at the Institution are provided to ensure that clear, complete, and timely information is available. Information regarding curriculum, courses, degree requirements, including suggested sequence pathways, programmatic brochures and handbooks, admission information, financial aid resources, and costs and payment policies are available on the College's main website located at www.frederick.edu under the Program, Admission, and Financial Aid tabs and in the Institutions academic catalog, which can be accessed at <https://www.frederick.edu/class-schedules/catalogs/fcc-catalog.aspx>. Information related to faculty/student interactions, assumption of technology competence and skills, technical equipment requirements, and the learning management system can be found under the 'Resources' tab located on the College main page <https://www.frederick.edu/handbook.aspx?cid=resources-top-link>. Not only is it essential that the College measure student achievement, it must also provide students with clear information on how they are expected to achieve each CLO. This is accomplished primarily at the course-level through information communicated on the syllabus.

9. Provide assurance and any appropriate evidence that advertising, recruiting, and admissions materials will clearly and accurately represent the proposed program and the services available.

The Frederick Community College website is managed by the Marketing department. Essential information is updated consistently in collaboration with all of the Institution's departments to include Academic Affairs, Learning Support, Financial Aid, Registration & Records, Student Development, and Enrollment Services. This process ensures the materials available are clear and accurate and contain pertinent information regarding all program offerings and services available. Upon confirmation of approval of the proposed program, the Institutional Effectiveness Department of the College would activate an integrated marketing communications plan.

H. Adequacy of Articulation

1. If applicable, discuss how the program supports articulation with programs at partner institutions. Provide all relevant articulation agreements.

Frederick Community College (FCC) and Frederick County Public Schools (FCPS) will have the opportunity to provide a transformational model of program implementation, including curricular development and alignment to marketing the program to our community. The proposed program will provide opportunities for students to move directly from secondary to post-secondary education while also providing entry and exit points to meet the needs of all students. FCC and FCPS are leading the state of Maryland with successful and promising practices in Dual Enrollment. FCC is in continual pursuit of innovative opportunities to serve all students, through innovative and collaborative partnerships with secondary schools, industry, and community partners. **See Appendix A: FCC and FCPS Articulation Agreement Contract**

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

1. Provide a brief narrative demonstrating the quality of program faculty. Include a summary list of faculty with appointment type, terminal degree title and field, academic title/rank, status (full-time, part-time, adjunct) and the course(s) each faculty member will teach (in this program).

The General Education courses comprised in the proposed program will be taught by existing faculty. Below is a list of full-time faculty, who are eligible to teach the general education and departmental requirements within the proposed program. There are more than 320 part-time faculty members teaching classes during the academic year who would be eligible to teach courses within the proposed program. Individuals are appointed on a semester-by-semester basis and teach in both the day and evening programs. Additional faculty will be hired to teach the departmental requirements as the program experiences enrollment growth.

Existing FCC Faculty eligible to teach in proposed program

Name	Degree/Field	Rank	Courses	Status
Ellis, Debra	Ph.D., Marine, Estuarine & Environmental Sciences	Associate Professor	Science	Full-time
Evans, Evan	M.S., Higher Education	Associate Professor	Math	Full-time
Ford, Bob	Ph.D., Educational Research and Evaluation	Professor	Science	Full-time
Frankenberry, Marc	Ph.D., Microbiology & Immunology	Assistant Professor	Science	Full-time
Gannon, Joanna	M.S., Curriculum & Instruction	Assistant Professor	Math	Full-time
Hartley, Josiah	M.S., Mathematics	Assistant Professor	Math	Full-time
Huff, Larry	M.S., Mathematics	Assistant Professor	Math	Full-time

Hull, Gary	M.S., Mathematics	Associate Professor	Math	Full-time
Lochman, Matthew	Ph.D., Mathematics	Assistant Professor	Math	Full-time
Lochman, Val	M.S., Mathematics	Assistant Professor	Math	Full-time
Lu, Gengshi	Ph.D., Life Sciences	Associate Professor	Science	Full-time
Marfani, Erum	M.S., Statistics	Assistant Professor	Math	Full-time
Morgan-Vallon, Mary	M.S., M.M.E., Mathematics	Associate Professor	Math	Full-time
Nellis, Wen	Ph.D., Chemistry	Assistant Professor	Science	Full-time
Newnam-Baicy, Jessica	Ph.D., Anthropology	Assistant Professor	Science	Full-time
Santelli, Jason	M.A., Broadcast Design	Assistant Professor	Communication, Humanities and Arts	Full-time
Sheirer, Lisa	M.F.A., Art	Associate Professor	Communication, Humanities and Arts	Full-time
Sheppard, Patricia	M.S., Biology	Assistant Professor	Science	Full-time
Staveley, Judy	M.S., Biology	Assistant Professor	Science	Interim
Taverner, Pei	M.S., M.Ed., Math Education	Associate Professor	Math	Full-time
Wood, Perry	Ph.D., Electrical Engineering	Assistant Professor	Science	Full-time
Yagodich, Dina	M.S., Applied & Computational Mathematics	Assistant Professor	Math	Full-time
Burke, Bryan	M.B.A., Business Administration	Adjunct Professor	CAD	Part-time
DiSandro, Jennifer	A.A.S., Architectural Design	Adjunct Professor	CAD	Part-time

Hess, Kyle	B.S., Mechanical Engineering Technology	Adjunct Professor	CAD	Part-time
Popkin, Forrest	B.S., Architecture	Adjunct Professor	CAD	Part-time

2. Demonstrate how the institution will provide ongoing pedagogy training for faculty in evidenced-based best practices, including training in: a) Pedagogy that meets the needs of the students; b) The learning management system; c) Evidenced-based best practices for distance education, if distance education is offered.

Through the Center for Teaching and Learning (CTL) and Diversity, Equity, and Inclusion (DEI), Academic Affairs offers adjunct and full-time faculty a responsive, innovative system of professional development in teaching and learning that reflects the characteristics and needs of FCC students. Blackboard is used as the Colleges learning management system.

Pedagogy and Evidence-based practices programming includes:

- New Full-time Faculty Orientation, a year-long series focused on introducing new full-time faculty and learning administrators to best practices in teaching and learning, and the policies, procedures, practices of the College
- New Adjunct Faculty Orientation, Adjunct Faculty Professional Development Evenings, and For Adjuncts Only, monthly theme-based gatherings
- Professional Development Services, provides teaching and learning resources and consultation, facilitates conference funding approval, houses the Alternative Credit Approval Team (ACAT), and supports the organization of Academic Affairs Faculty and Leadership Retreats
- Teaching & Learning Hours, four tracks of professional development sessions designed to inspire faculty to engage students' minds and support their success through active learning, innovation, and scholarship, including Culturally Responsive Teaching and Cultural and Global Competence Development; Scholarship of Teaching and Learning; Technology, Teaching, and Innovation; and Faculty Leadership and Academic Management
- CTL Faculty Scholars Program, designed to support the professional development needs of full-time and adjunct faculty by providing faculty subject matter experts the opportunity to create and deliver Teaching and Learning Hours in support of professional development priorities
- Dual Enrollment Instructor Professional Development, sessions designed specifically for high-school based instructors teaching FCC credit courses
- Academic department chairs, program managers, and fellow faculty provide discipline-specific training and professional development for adjunct and full-time faculty such as lab safety, clinical orientation, outcomes assessment, curricular requirements, and equipment use.
- Further, full-time faculty are supported in their pathways to promotion through the Faculty Appointment and Promotion Process. The myriad pathways to promotion including alternative credit options which are approved by the Alternative Credit Approval Team (ACAT).
- Finally, in collaboration with Human Resources' Employee Development Advisory Team (EDAT) and other College stakeholders, Academic Affairs ensures that development of faculty and staff by supporting the orientation of new employees; the ongoing training of faculty and staff on College policies and procedures, business processes, wellness, hiring.

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

- 1. Describe the library resources available and/or the measures to be taken to ensure resources are adequate to support the proposed program. If the program is to be implemented within existing institutional resources, include a supportive statement by the President for library resources to meet the program's needs.**

No new library holdings will need to be purchased during the planning phase for this proposed program. An annual review of existing library resources that support the proposed program will be reviewed and updated as needed. A deep set of research resources supports the curricula and research needs of student, faculty, and staff are available. Most content is digital, which allows for robust search options and off-campus access. Key services include collections management, research support, and information literacy instruction. Existing library support include library loan mechanisms and electronic data retrieval methods currently in place that can be utilized. The library exceeds state and national standards for community, junior, and technical college learning resource programs. There is a librarian on staff who may be contacted for bibliographical searches and enable access to discipline-specific materials.

The President affirms library resources are available to meet the program's needs.

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

- 1. Provide an assurance that physical facilities, infrastructure and instruction equipment are adequate to initiate the program, particularly as related to spaces for classrooms, staff and faculty offices, and laboratories for studies in the technologies and sciences. If the program is to be implemented within existing institutional resources, include a supportive statement by the President for adequate equipment and facilities to meet the program's needs.**

Frederick Community College continues to evaluate and enhance its 2012-2022 Facilities Master Plan (FMP), which supports the College role and mission of developing a vision and long-range plan for College facilities that support teaching, learning, student success, and affordability. FCC's main campus is situated on approximately 95 acres which is approximately 557,648.26 square feet. The main campus is comprised of 20 buildings that contain an assortment of classroom, office space and other areas that promote a positive student experience. In addition to the main campus, FCC has extended classroom and office space located at 200 Monroe Avenue, Frederick, Maryland 21701 our secondary campus. The Monroe Center is approximately 55,000 square-feet and is located within a short driving distance of the main campus. The Monroe Center also includes classrooms for additional academic and continuing education programs. Both facilities are ADA compliant.

In an effort to maximize utilization and efficient use of space, the College uses a space management software called 25Live. Through its physical facilities, the institution creates and maintains an environment beneficial to teaching and learning for our students, faculty and staff. Quality facilities are vital to the institution's educational services and other aspects of the institutions mission. The proposed program will have dedicated classrooms and labs equipped with projectors, white boards and other smart technology, and faculty office space which will enable us to provide an environment conducive to student success, as well as teaching and learning productivity.

The President affirms the availability of adequate equipment and facilities to meet the program's needs.

- 2. Provide assurance and any appropriate evidence that the institution will ensure students enrolled in and faculty teaching in distance education will have adequate access to: a) An institutional electronic mailing system, and b) A learning management system that provides the necessary technological support for distance education.**

The Center for Distributed Learning at FCC provides leadership, guidance, support, and faculty development for student centered learning through diverse learning technologies. The Center for Distributed Learning oversees and facilitates the administration and quality assurance of all online courses and online degree/certificate programs. The College learning management system used is Blackboard. Blackboard is a virtual learning environment and course management tools used by faculty to manage and deliver online and hybrid courses. Blackboard and faculty assigned College specific email address serve as the institutional electronic mailing system to ensure faculty and student access.

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

- 1. Complete [Table 1: Resources and Narrative Rationale](#). Provide finance data for the first five years of program implementation. Enter figures into each cell and provide a total for each year. Also provide a narrative rationale for each resource category. If resources have been or will be reallocated to support the proposed program, briefly discuss the sources of those funds.**

TABLE 1: RESOURCES

TABLE 1: PROGRAM RESOURCES					
Resource Categories	Year 1	Year 2	Year 3	Year 4	Year 5
1. Reallocated Funds	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00
2. Tuition/Fee Revenue (c + g below)	\$124,992.00	\$126,312.00	\$127,512.00	\$128,856.00	\$130,056.00
a. Number of F/T Students	24	24	24	24	24
b. Annual Tuition/Fee Rate	\$4,458	\$4,503	\$4,548	\$4,594	\$4,639
c. Total F/T Revenue (a x b)	\$106,992.00	\$108,072.00	\$109,152.00	\$110,256.00	\$111,336.00
d. Number of P/T Students	10	10	10	10	10
e. Credit Hour Rate	\$150	\$152	\$153	\$155	\$156
f. Annual Credit Hour Rate	12	12	12	12	12

g.Total P/T Revenue (d x e x f)	\$18,000.00	\$18,240.00	\$18,360.00	\$18,600.00	\$18,720.00
3. Grants, Contracts & Other External Sources	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00
4. Other Sources	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00
TOTAL (Add 1 – 4)	\$124,992.0 0	\$126,312.0 0	\$127,512.0 0	\$128,856.0 0	\$130,056.0 0

TABLE 1: PROGRAM RESOURCES AND NARRATIVE RATIONALE

Reallocated Funds

Data: Enter the amount of funds for the first five years of implementation that will be reallocated from existing campus resources to support the proposed program. This would include funds reallocated from the discontinuance or downsizing of academic programs.

Narrative: Analyze the overall impact that the reallocation will have on the institution, particularly on existing programs and organizational units.

Most expenses from the proposed program have already been incurred to maintain the institution's current Engineering and Computer Aided Design Technology (CAD) programs.

Tuition and Fee Revenue

Data: Enter the estimated tuition and fee revenue that will be directly attributable to students new to the institution enrolled in this program each year. The revenue should be calculated by multiplying the tuition rate by the projected annual FTE enrollment.

Narrative: Describe the rationale for the enrollment projections used to calculate tuition and fee revenue.

The institution expects similar enrollments in the proposed program related to those in the current CAD programs. The CAD program currently has 34 declared major, with an average of 24 full-time students and 10 part-time students. Calculations utilize current tuition and fees and project a 1% increase each year. The average number of credits taken per year by part-time students is 12.

Grants and Contracts

Data: Enter the amount of grants, contracts or other external funding which will become available each of the five years as a direct result of this program.

Narrative: Provide detailed information on the sources of the funding. Attach copies of documentation supporting the funding. Also, describe alternative methods of continuing to finance the program after the outside funds cease to be available. Conditional approval may be granted to a proposal that is dependent on grant funds that have not been officially awarded at the time of proposal submission, but in which substantial evidence has been provided to indicate a favorable review and an impending grant award is imminent. Under these conditions, program approval may be granted for a twelve-month period. During this period, the program may not be implemented. Full program approval is granted only after funding documentation is accepted. Under extraordinary circumstances, a one-time extension to conditional approval may be granted to an institution that provides compelling information to warrant an extension.

No grants or contracts are expected in the next five years for the proposed program.

Other Sources

Data: Enter any additional funds from sources other than in 1, 2, and 3 that have been specifically designated for the program.

Narrative: Provide detailed information on the sources of the funding, including supporting documentation.

Not Applicable

Total Year

Data: Total the financial resources that will be available for each year of program implementation. Include cumulative as well as one-time resources.

Narrative: Additional explanation or comments as needed.

Total Year financial resources amount to \$124,992.00 in the first year.

TABLE 2: PROGRAM EXPENDITURES

TABLE 2: PROGRAM EXPENDITURES					
Expenditure Categories	Year 1	Year 2	Year 3	Year 4	Year 5
1. Faculty (b + c below)	\$23,200.00	\$23,200.00	\$23,896	\$23,896	\$23,896
a. Number of FTE	.5	.5	.5	.5	.5
b. Total Salary	\$2,900.00	\$2,900.00	\$2,987.00	\$2,987.00	\$2,987.00
c. Total Benefits	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00
2. Admin. Staff (b + c below)	\$21,366.80	\$21,366.80	\$22,007.80	\$22,007.80	\$22,007.80
a. Number of FTE	.1	.1	.1	.1	.1
b. Total Salary	\$11,155.80	\$11,155.80	\$11,490.47	\$11,490.47	\$11,490.47
c. Total Benefits	\$10,211.00	\$10,211.00	\$10,517.33	\$10,517.33	\$10,517.33
3. Support Staff (b + c below)	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00
a. Number of FTE	0	0	0	0	0
b. Total Salary	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00
c. Total Benefits	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00

4. Technical Support and Equipment	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00
5. Library	\$9,423.00	\$9,423.00	\$9,611.46	\$9,611.46	\$9,611.46
6. New or Renovated Space	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00
7. Other Expenses	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00
TOTAL (Add 1 – 7)	\$53,989.80	\$53,989.80	\$55,515.26	\$55,515.26	\$55,515.26

TABLE 2: PROGRAM EXPENDITURES AND NARRATIVE RATIONALE

Faculty (# FTE, Salary, and Benefits): Enter (a) the cumulative number of new fulltime equivalent faculty needed to implement the program each year, (b) the related salary expenditures, and (c) the related fringe benefit expenditures. (For example, if two new faculty members are needed, one in the first year and one in the second, the full-time equivalency, salary, and benefits for one member should be reported in Year 1, and the same information for both members should be reported in Year 2 and each successive year.)

With a fairly consistent enrollment of 34 students per year, the proposed program requires roughly eight directly program-related course sections that are taught by all .5 part-time faculty each academic year. The cost to the institution (at an average of \$2,900/course part-time) is \$23,200.00 in salary. A 3% COLA is included in Year 3.

Administrative Staff (# FTE, Salary, and Benefits): Enter (a) the cumulative number of new full-time equivalent administrative staff needed to implement the program each year, (b) the related salary expenditures, and (c) the related fringe benefit expenditures.

The proposed program will be supported by the Assistant Dean, Career Programs. This position is currently slated as a grade 13 with a salary range starting at \$55,779. The Assistant Dean, Career Programs manages two programs (Construction Management Technology, Computer Aided Design Technology), as well as oversight of the Perkins and Prior Learning Assessment. At the rates enumerated above, oversight of the proposed program represents a maximum of 1/5 of the Assistant Dean's job duties. This equates to \$11,155.80 dollars and a benefit cost of \$10,211. A 3% COLA is included in Year 3.

Support Staff (# FTE, Salary, and Benefits): Enter (a) the cumulative number of new full-time equivalent support staff needed to implement the program each year, (b) the related salary expenditures, and (c) the related fringe benefits expenditures.

The program is supported by the Assistant Dean, Career Programs and does not have direct support staff dedicated to the program.

Equipment: Enter the anticipated expenditures for equipment necessary for the implementation and continuing operation of the program each year.

This program utilizes equipment already in house from the CAD and Engineering programs, thus, having no new equipment cost.

Library: Enter the anticipated expenditures for library materials directly attributable to the new program each year.

No new library holdings will need to be purchased for this program. Currently library loan mechanisms and electronic data retrieval methods can be utilized. The library exceeds state and national standards for community, junior, and technical college learning resource programs. There is a librarian who may be contacted for bibliographical searches and for the purchase of discipline-specific materials.

New and/or Renovated Space: Enter anticipated expenditures for any special facilities (general classroom, laboratory, office, etc.) that will be required for the new program. As a footnote to the table or in attached narrative, indicate whether the renovation of existing facilities will be sufficient or new facilities will be necessary.

This program requires no new or renovated space.

Other Expenses: Enter other expenditures required for the new program. Attach descriptive narrative or provide footnotes on the table. Included in this category should be allowances for faculty development, travel, memberships, office supplies, communications, data processing, equipment maintenance, rentals, etc.

There are no other expenses associated with this program.

Total Year: Add each expenditure (continuing and one-time) to indicate total expenditures for each year of operation.

The total expenses for the first year of the program are \$53,989.80. All of the expenses associated with the proposed program would be covered by the initial \$124,992.00 of tuition revenue projected for the program.

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

1. Discuss procedures for evaluating courses, faculty and student learning outcomes.

The Frederick Community College mission includes the phrase, “With teaching and learning as our primary focus,” therefore the foundation of student learning and instruction are student learning outcomes. These outcomes identify what the student will know, be able to accomplish, and value at the end of their academic courses and programs. Student Learning Outcomes Assessment formally began at Frederick Community College in 2006 with the advent of the first Outcomes Assessment Council 3-Year Course-Level Assessment Cycle. Since that date, assessment across campus has expanded and evolved to better understand and enhance the learning experience of students. The assessment process at FCC is:

- **Faculty Driven** (Faculty are best suited to determine the intended educational outcomes of their academic programs and activities, how to assess these outcomes, and how to use the results for program development and improvement),

- **Meaningful** (Assessment activities should be integrated learning activities that fit seamlessly into the course or program and provide meaningful results which impact student learning),
- **Sustainable** (Although the collection and reporting of data will take some additional effort, it should not be excessively burdensome to the faculty, staff, or the institution), and
- **Consistent and Reliable** (All courses and programs should have defined outcomes and similar expectations for student learning).

Course-Level Assessment

Course-level assessment is the foundation of all other assessment data collection activities. Course-level assessment is performed by faculty as designated in the syllabi of record for each course. Faculty use exams, projects, or other assignments to better understand how students are learning in each individual course. This data is then mapped to general education or program level outcomes. For general education, each syllabi of record includes the general education goals along with the corresponding individual course-level learning outcomes. Data related to these outcomes is then collected in the observations portion of TK20 following the General Education CORE Assessment Schedule. For programmatic assessment, courses are mapped to programmatic outcomes using the curriculum map. Data for corresponding courses is then collected using the assessment planning platform in TK20 to ensure that students are achieving their outcomes.

The primary ways the institution measures student learning are through the processes previously described for course-level and program level assessment. In addition to these processes, the College also measures the institution through strategic planning. The challenge for the College at the institutional level is to create learning goals that fit a wide variety of educational offerings. OPAIR routinely administers surveys to students and faculty (i.e. Community College Survey of Student Engagement, Personal Assessment of the College Environment, etc.) and uses enrollment, transfer, graduation rate, and other data to inform the College about strengths and weaknesses of its planning and programs.

3. Explain how the institution will evaluate the proposed program's educational effectiveness, including assessments of student learning outcomes, student retention, student and faculty satisfaction, and cost-effectiveness.

Program and certificate level assessment is performed as part of the program review process. The College current APR (Academic Program Review) process examines programs within the context of its mission, goals, and objectives; trends according to internal and external data; assessment of student learning; resources, support, and viability; and key findings and recommendations for the future. Moreover, this process along with quantitative measures can be used as guides for new program developments and budgetary allocations related to programmatic requests. The foundation of the programmatic learning outcomes assessment process is the curriculum map. The curriculum map serves as a diagram which identifies where specific student learning outcomes are introduced, enhanced, and assessed within program core courses. The program manager should submit their data into the assessment planning component of the TK20 platform annually to track achievement of programmatic learning outcomes. FCC requires all full-time and adjunct faculty to engage in student assessment in their classes as stated in the respective job descriptions. The first essential function noted in both the full-time and adjunct faculty job descriptions is to prepare, deliver and assess learning activities that are consistent with Core Learning Outcomes.

Students' retention rate is tracked to measure the continuity of students at a specific institution. In accordance with IPEDS guidelines, community colleges track first-time, degree seeking, and full-or part-time students who returned to the institutions to continue their studies the following fall. The latest available statewide data includes fall 2016 students returning in fall 2017. The fall 2016 to fall 2017 retention rate for full-time students at FCC was 67%, 5th highest among Maryland Community Colleges and well above the statewide retention rate for full-time students (61%). The retention rate of part-time students at FCC was 53% (tied for second highest alongside Montgomery College, Anne Arundel Community College and Harford Community College), eclipsing the statewide part-time student average retention rate of 31%.

Additional strategies for student retention activities include the development of Student Success Alert (SSA) process. The SSA was designed to provide early intervention and support for students. Student Success Funds are made available through FCC's Foundation to provide support to students and can help them through an array of financial emergencies, which empowers persistence and retention. Also, the Parents Lead program provides scholarships to parents in the pursuit of a college degree. The program provides specialized curriculum and advising services, as well as a scholarship to offset the cost of attendance while parents are enrolled in evening classes. It is a cohort-based program with a combination of online and on-campus evening classes, and can be completed in as few as five semesters. The scholarship is also funded by the FCC Foundation and the program will begin in spring of FY 2018.

Student satisfaction is measured through evaluations that are conducted each semester. We conduct graduate surveys every two years and these tools are used to help the College improve develop targeted student retention initiative that impact a student quality of life and learning experiences.

Frederick Community College ranks 7th out of 16 community colleges related to cost-effectiveness (tuition and fees) for residents of the Frederick County service area as highlighted in the Maryland Association of Community Colleges 2018 Data Book. This data is based on dividing what a full-time student (taking 30 credits in an academic year) would pay on a "per credit" basis – that is dividing a total year's tuition and fees by 30.

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

1. Discuss how the proposed program addresses minority student access & success, and the institution's cultural diversity goals and initiatives.

The College has responded to the increased demographic diversity in Frederick County and the State of Maryland. The College offers four academic support programs that provide services to students who may be a part of a special population group (non-traditional college students, students of color, students with disabilities, and veterans). Adult Services, Multicultural Student Services, Services for Students with Disabilities, and Veteran Services are comprehensive programs offering specialized support services to address the specific needs of the students in their program, many of whom are often enrolled in developmental courses.

Co-curricular programming is developed through the Office of Student Engagement. Once each semester, the College holds a thematic co-curricular day where nationally-recognized

speakers, artists, and professionals come to campus for thought provoking talks and presentations open to all students, faculty, staff, and the community. While diversity at FCC has traditionally been defined as “the wide range of cultural, racial, and ethnic backgrounds, human conditions and belief,” this outreach has come in the consolidated form of a single office. Respect for a plurality of age and experience is reflected through the Veteran’s Affairs Office, the Office of Adult Services, and the Disabilities Office. Students voluntarily sign-up to participate in these programs and receive support and services throughout the entire time they are enrolled. In addition, the College offers a number of College-wide activities and events to foster a climate of tolerance for diversity. The College makes an earnest effort to reach ethnical and racial minorities at FCC.

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

- 1. If the proposed program is directly related to an identified low productivity program, discuss how the fiscal resources (including faculty, administration, library resources and general operating expenses) may be redistributed to this program.**

The proposed program is not directly related to an identified low productivity program.

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

- 1. Provide affirmation and any appropriate evidence that the institution is eligible to provide Distance Education.**

The College launched its Online Course Program in 2000, gradually replacing a set of Tele-Courses (College of the Air). The program has grown from 15 courses with 272 enrollments in 1999-2000 to 367 sections with an annual enrollment of some 6300 in 2014-15. Quality assurance of the online courses is maintained formally with the Quality Matters (QM) course review protocol. The College’s Institutional Values, Mission, Vision, and Strategic Goals guide the delivery of all instruction regardless of the delivery format. For more than 15 years, the College has demonstrated a commitment to offering a successful, high-quality online program with an appropriate academic and technical infrastructure.

Online learning has become an integral part of teaching and learning at FCC. Budget allocations support a staff in the Center for Distributed Learning as well as online program initiatives already in place such as curriculum development, Quality Matter course reviews, faculty training, and learning object database subscriptions. As part of the Center for Teaching and Learning, the Center for Distributed Learning (CDL) is fully integrated into the curriculum, governance, and administrative processes of the College. FCC faculty teaching online courses receive individual training and course development and guidelines from the Department of Distributed Learning.

- 2. Provide assurance and any appropriate evidence that the institution complies with the C-RAC guidelines, particularly as it relates to the proposed program.**

In compliance with C-RAC guidelines, all online instructors are subject to a peer course evaluation, and instructors can apply for Quality Matters certification. Students evaluate each course at the end of each semester. Program managers, department chairs, the AVP/Deans in Academic Affairs and the Provost have access to each student course evaluation in their area. Student feedback is used for course and program improvement, and faculty are expected to reflect on student evaluations in their annual self-evaluation. Program-level evaluation for

Distributed Learning is ongoing and is documented in detail in a series of annual or bi-annual reports by the Center for Distributed Learning. The Quality Matters (QM) Peer Review protocol is at the center of the College's quality assurance efforts in course design. The QM protocol is based on a rubric with 43 key quality standards for an online course. The standards are used to peer-review existing online courses at FCC, to guide the design of new courses, and shape the training of online faculty. Sixty-nine percent of fully online courses have been formally QM reviewed.

A protocol for re-reviewing QM courses with expired review terms are in place. The College has made every effort to comply with relevant federal and state regulations for its Program of Online Courses, for example, the efforts to comply with Substantive Change in Degree Programs, ADA compliance requirements, compliance with the federal definition of a Credit Hour, compliance with current copy right provisions, and USDOE's State Authorization Regulations. As a member of Maryland Online (MOL), FCC is part of two interconnected contractual arrangements with MOL and Quality Matters (QM). The MOL course-sharing initiative (Seatbank) provides students from different Maryland Community Colleges with greater access to distance learning opportunities. Colleges share distance learning courses with the expectation that the shared courses meet the same quality standards as articulated in the rubric updated biannually for QM's peer review process.



Appendix A:

FCC and FCPS Articulation Agreement Contract.



Frederick County Public Schools

Frederick Community College

2018-2019 Articulation Agreements

Frederick County Public Schools (FCPS) and Frederick Community College (FCC) continue a long tradition of providing opportunities for high school graduates to receive college credit for the successful completion of identified high school courses in Career and Technology Education. These agencies agree to the attached *Articulation Agreement* for the 2018-2019 high school graduates. FCC will award college credit to FCPS graduates who meet all requirements, as listed in the attached agreements. FCC will award credit for the identified articulated courses upon the FCC Registrar's receipt of the graduate's official high school transcript and the articulation agreements credit request form. The FCPS graduate must initiate the request for credit within two years of his or her graduation from high school.

Dr. Theresa Alban, Superintendent

Frederick County Public Schools

Date

Elizabeth Burmaster, President

Frederick Community College

Date