



UNIVERSITY OF MARYLAND EASTERN SHORE
Office of the President

April 15, 2026

Dr. Elena Quiroz-Livanis
Acting Secretary of Education
Maryland Higher Education Commission
217 E. Redwood Street, Suite 2100
Baltimore, MD 21202

RE: Proposal for New Academic Program (BS in Construction Engineering)

Dear Dr. Quiroz-Livanis:

The University of Maryland Eastern Shore (UMES) hereby submits a proposal to begin offering a new Bachelor of Science in Construction Engineering within the School of Business, Engineering, Applied Sciences, Technology, and Tourism Management (S-BEAST-TM).

Consistent with its mission, UMES seeks to expand its capacity to offer unique and/or critical certificate and degree programs. Accordingly, UMES has developed a Bachelor of Science in Construction Engineering degree designed to align with the accreditation standards of the Accreditation Board for Engineering and Technology (ABET). The program will equip students with the knowledge and skills necessary to support modern infrastructure development, advance engineering education on the Eastern Shore and across Maryland and address critical workforce needs.

The curriculum integrates mathematics, science, and engineering principles with core coursework in structural, transportation, geotechnical, environmental, and water resources engineering. It prepares a diverse and highly skilled workforce for professional licensure, graduate study, and careers in both the public and private sectors by addressing real-world challenges and advancing infrastructure development, sustainability, and community well-being. The program also complements existing engineering offerings within the University System of Maryland.

The proposed degree program will position UMES at the forefront of educational innovation in STEM-related academic programs. It aligns with UMES's strategic priorities by advancing academic excellence, workforce development, innovation, and equitable access to STEM education. The Maryland construction industry is currently experiencing a transition period marked by strong federally backed infrastructure investments, growth in specialized sectors such as data centers, and persistent labor shortages. The proposed Bachelor of Science in Construction Engineering degree is designed to respond to this demand by providing a comprehensive curriculum that equips graduates with the skills necessary to design, analyze, and implement complex infrastructure projects. Graduates of the program will be well prepared to excel in a dynamic professional environment, meet evolving industry needs, and contribute to sustainable and innovative engineering solutions.

The UMES campus is in Somerset County, Maryland. The Bachelor of Science in Construction Engineering degree will expand the educational opportunities for educationally disadvantaged students by developing a high-quality and innovative academic program that aligns with the educational needs of the region and the State of Maryland. The mission of the proposed program is to provide students and working professionals with advanced training in the discipline and to contribute to the economic development in the state of Maryland, especially in the Eastern Shore region where learning opportunities in advanced engineering disciplines are severely limited.

The attached proposal has undergone the established UMES curriculum approval process, and I fully support the proposed program.

Thank you for your consideration.

Sincerely,

A handwritten signature in black ink, appearing to read "Heidi M. Anderson". The signature is fluid and cursive, written over a light blue horizontal line.

Heidi M. Anderson, Ph.D., FAPhA
President

Copy: Dr. Rondall Allen, Provost and Vice President for Academic Affairs
Dr. Derrek Dunn, Dean, School of Business and Technology
Dr. Ishmail Farajpour, Department Chair, The Built Environment



Office Use Only: PP#

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

Institution Submitting Proposal	University of Maryland Eastern Shore
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Each action below requires a separate proposal and cover sheet.

- | | |
|---|---|
| <input checked="" type="radio"/> New Academic Program | <input type="radio"/> Substantial Change to a Degree Program |
| <input 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 <input checked="" type="radio"/> Yes	Payment <input checked="" type="radio"/> R*STARS # JE351061	Payment	Date
Submitted: <input type="radio"/> No	Type: <input type="radio"/> Check #	Amount: \$850	Submitted: Dec 2024

Department Proposing Program	Department of the Built Environment		
Degree Level and Degree Type	Bachelor of Science		
Title of Proposed Program	Construction Engineering		
Total Number of Credits	120		
Suggested Codes	HEGIS: 908	CIP: 143301	
Program Modality	<input checked="" type="radio"/> On-campus <input type="radio"/> Distance Education (fully online) <input type="radio"/> Both		
Program Resources	<input checked="" type="radio"/> Using Existing Resources <input type="radio"/> Requiring New Resources		
Projected Implementation Date <small>(must be 60 days from proposal submission as per COMAR 13B.02.03.03)</small>	<input checked="" type="radio"/> Fall <input type="radio"/> Spring <input type="radio"/> Summer Year: 2026		
Provide Link to Most Recent Academic Catalog	URL: https://wwwcp.umes.edu/schedule/academic-catalogs/		

Preferred Contact for this Proposal	Name: Leesa Thomas Banks		
	Title: Interim Vice Provost Academic Affairs		
	Phone: 410-651-7591		
	Email: lpthomasbanks@umes.edu		

President/Chief Executive	Type Name: Heidi M Anderson		
	Signature:	Date: 4/15/2026	

	Date of Approval/Endorsement by Governing Board: 12/9/2025
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Revised 4/2025

Proposal for New Four-Year Undergraduate Degree Program

Bachelor of Science in Construction Engineering

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 Department of the Built Environment at the University of Maryland Eastern Shore (UMES) proposes expanding its academic offerings in the field of construction through the establishment of a Bachelor of Science in Construction Engineering. This four-year degree program is designed to align with the accreditation standards set by the Accreditation Board for Engineering and Technology (ABET). ABET's 2025-2026 Criteria for Accrediting Construction and Similarly Named Engineering Programs guidelines state, "The program must prepare graduates to apply mathematics through differential and integral calculus, probability and statistics, general chemistry, and calculus-based physics; apply knowledge of construction methods, materials, equipment, planning, scheduling, safety, and cost analysis; analyze and design construction processes and systems in a construction engineering specialty field; explain basic legal and ethical concepts and the importance of professional engineering licensure in the construction industry; explain basic concepts of management topics such as economics, business, accounting, communications, leadership, decision and optimization methods, engineering economics, engineering management, and cost control."

(Source: <https://www.abet.org/accreditation/accreditation-criteria/criteria-for-accrediting-engineering-programs-2025-2026/>)

The proposed program has been developed to meet these rigorous standards and prepare graduates for successful careers in construction engineering and management.

The curriculum comprises core construction engineering courses, foundational coursework in science and mathematics, and a selection of major electives, alongside the university's general education requirements. It is designed to provide students with a comprehensive foundation in construction engineering, emphasizing key areas such as construction methods, materials, sustainability, and project management.

The proposed Bachelor of Science in Construction Engineering directly aligns with the university's mission by advancing educational and professional opportunities in engineering and supporting the institution's broader goals of academic excellence, innovation, and community engagement.

The University of Maryland Eastern Shore (UMES), the state's historically Black 1890 land-grant institution, grounds its purpose and uniqueness in distinctive opportunities for learning, discovery, and engagement across the arts and sciences, education, technology, engineering, agriculture, business, and health professions. UMES offers degrees at bachelor's, master's, and doctoral levels. (UMES Mission: <https://wwwcp.umes.edu/about/vision-mission-and-values/>)

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

The proposed undergraduate Construction Engineering program directly supports the institution's strategic goals. According to the UMES Strategic Plan (<https://wwwcp.umes.edu/president/strategic-plan/>). Specifically, the program aligns with the following priorities:

Priority 1: Goal 1.1: Attract, retain, and graduate more aspiring students at the undergraduate and graduate levels.

Description: The Construction Engineering program offers a unique and high-demand field of study, attracting a diverse population of students interested in STEM disciplines. Its robust curriculum and emphasis on practical applications are designed to enhance student retention and successful graduation outcomes.

Priority 1: Goal 1.7: Pilot innovative pathways for working professionals that respond to workforce demands.

Description: While primarily structured as a traditional four-year undergraduate program, Construction Engineering may be adapted in the future to include evening or part-time options. This flexibility could create alternative pathways for working professionals seeking formal credentials in Construction Engineering.

Priority 2: Goal 2.3: Develop innovative programs that result in opportunities for new credentials.

Description: The ABET-aligned curriculum ensures that graduates are well prepared to pursue professional credentials, including the Fundamentals of Engineering (FE) exam—a critical first step toward obtaining Professional Engineer (PE) licensure, and the Certified Construction Manager (CCM) credential.

Priority 2: Goal 2.6: Strengthen programs, concentrations, and certificates, making them more relevant to the workforce and societal needs.

Description: The Construction Engineering program addresses the growing demand for professionals skilled in sustainable construction, advanced

construction methods, and project management. This demand is supported by labor market projections; according to the Bureau of Labor Statistics (BLS), construction manager employment is projected to grow by 9% from 2024 to 2034, which is much faster than average. The curriculum ensures relevance to modern workforce needs and responsiveness to societal challenges.

Priority 3: Goal 3.2: Expand the number of graduates in fields critical to Maryland's economy: STEAM, cyber, and healthcare.

Description: The program directly contributes to Maryland's STEAM workforce by preparing skilled professionals for careers in construction, infrastructure development, and project management.

Priority 3: Goal 3.3: Diversify and strengthen Maryland's knowledge workforce by expanding the pipeline of underrepresented minority students entering critical workforce fields (STEAM, cyber, health care, education, social work, human services, technology).

Description: As a historically Black institution, UMES is uniquely positioned to diversify the construction engineering workforce by graduating underrepresented minority students who are well prepared to contribute meaningfully to this vital field. According to the Fall 2025 Census Enrollment Summary, UMES serves a diverse student population, with an ethnic distribution of: Black 64.5%, White 14%, Native American 0.2%, Asian 2.2%, Hispanic 3.2%, International 4.5%, Multi & Non-Hispanic 5.4%, and Unknown 5.9%.

Priority 3: Goal 3.4: Develop new, revise, and enhance existing academic programs to remain current with evolving workforce demands.

Description: The program will remain responsive to industry demands and advancements, continuously evolving to equip graduates with the knowledge and skills needed to excel in emerging technologies and practices in the construction engineering profession.

The proposed degree program will enable the University of Maryland Eastern Shore to achieve its strategic goals while strengthening its position as a leader in educational innovation within the construction industry. Through the development of innovative academic pathways, strong industry partnerships, and a commitment to serving underrepresented populations, the Construction Engineering program will not only support the mission of UMES but also support the economic advancement and workplace development goals of the state of Maryland.

3. Provide a brief narrative of how the proposed program will be adequately funded for at least the first five years of program implementation. (Additional related information is required in section L.)

The University of Maryland Eastern Shore will support the proposed program through the resources, facilities, and faculty currently in place within the Department of the Built Environment, consistent with the level of support provided to existing academic programs. This commitment ensures effective program delivery and student success. (Please see Section L for more details.)

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

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

The University administration is committed to adequately funding this program. With support from the HBCU Lawsuit Settlement fund, UMES, and the School of Business, Engineering, Applied Sciences, Technology, and Tourism Management, the Department of the Built Environment is equipped with the necessary resources and is committed to supporting the program in every way, including ongoing administrative, financial, and technical support. The resources, expenditures, and financial sustainability of the program are outlined in Section L.

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

The University of Maryland Eastern Shore is committed to supporting the program with sufficient time for enrolled students to complete the Bachelor of Science in Construction Engineering degree. To accomplish the strategic goals identified earlier and maintain the quality of the department, continued support of this program and its students through graduation is essential to the UMES mission and goals. This commitment includes the allocation of administrative support, instructional facilities, and necessary financial resources to ensure program continuity through students' graduation.

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

1. Demonstrate demand and need for the program in terms of meeting present and future needs of the region and the state in general based on one or more of the following:

a) The need for the advancement and evolution of knowledge.

The Maryland construction industry is experiencing a transition period characterized by strong federally-backed infrastructure projects, a pivot toward specialized sectors such as data centers, and ongoing labor shortages. The proposed Bachelor of Science in Construction Engineering degree is

designed to address this demand by offering a comprehensive curriculum that equips graduates with the knowledge and skills necessary to effectively manage day-to-day construction site operations. This program prepares students to excel in a dynamic and challenging career, contributing to the advancement of sustainable and innovative infrastructure development. Key drivers of current industry demand include significant public investment in projects such as the Frederick Douglass Tunnel Program and the revived Red Line light rail project, legislative initiatives like the Starter and Silver Homes Act of 2026 to support affordable housing, the adoption of AI-enabled tools and modular construction to address labor shortages, and the ongoing need for cost and material management amid economic pressures..

b) Societal needs, including expanding educational opportunities and choices for minority and educationally disadvantaged students at institutions of higher education.

The University of Maryland Eastern Shore (UMES) is strategically located in Somerset County, one of the most economically disadvantaged counties in Maryland, according to the U.S. Census Bureau. The proposed B.S. in Construction Engineering program is designed to offer minority, and educationally disadvantaged students access to a high-quality education in a field that is experiencing robust growth.

Currently, construction engineering professionals are predominantly White (52.9%), followed by Hispanic or Latino (27.7%) and Black or African American (11.1%), reflecting a clear underrepresentation of Black professionals in the field (Construction Employers Association, <https://www.ceacisp.org/news/construction-worker-demographics-us#:~:text=The%20average%20age%20of%20an,94%25%20of%20what%20men%20earned.>) According to recent U.S. Census data, the Black population in the United States represents approximately 13.7% of the total population.

As a historically Black university, UMES is uniquely positioned to address this gap. Graduates of the proposed program will be well-prepared to secure competitive entry-level positions with strong earning potential, contributing not only to their personal advancement but also to the broader economic and societal development of both the Eastern Shore and the State of Maryland. This program represents a critical opportunity to diversify the construction engineering workforce and uplift local communities by fostering greater representation and opportunity in the field.

c) The need to strengthen and expand the capacity of historically black institutions to provide high-quality and unique educational programs.

The proposed B.S. in Construction Engineering program will offer high-quality and distinctive educational experiences to students, thereby enhancing its significance as one of the four Historically Black Institutions (HBIs) in the State of Maryland. By providing access to a rigorous STEM program in a high-demand field, this program supports the mission of HBIs to strengthen and expand educational opportunities for underrepresented populations. It will increase the number of minority students earning degrees in construction engineering, a field where diversity remains limited, and contribute to workforce development, regional economic growth, and the competitiveness of Maryland's construction industry.

2. Provide evidence that the perceived need is consistent with the Maryland State Plan for Postsecondary Education.

According to the 2022 *Maryland State Plan for Higher Education*, developed by the Maryland Higher Education Commission (MHEC), three primary goals for the state's postsecondary education system are outlined:

“Student Access: Ensure equitable access to affordable and high-quality postsecondary education for all Maryland residents.”

The B.S. in Construction Engineering Program will prepare students at the undergraduate level to become on-site engineers for construction projects to ensure they are scheduled and built according to plans and specifications. The proposed Construction Engineering degree program will offer high-quality education to Maryland residents, including those with disadvantaged backgrounds, creating a pathway to a rewarding career in construction engineering. It equips students with the knowledge and experience that supports the development of a skilled and diverse workforce for the state.

“Student Success: Promote and implement practices and policies that will ensure student success.”

The practices and policies concerning the proposed Construction Engineering program align with all existing policies at the University of Maryland Eastern Shore, which will ensure student success. By providing a carefully developed curriculum, sufficient laboratory facilities, equipment, strong industry partnerships and adequate faculty members for teaching and advising, the proposed degree program will help ensure timely graduation and successful job placement.

“Innovation: Foster innovation in all aspects of Maryland higher education to improve access and student success.”

The proposed B.S. in Construction Engineering program aligns with Maryland's 2022 State Plan for Higher Education by fostering innovation, expanding access, and promoting student success. In response to changing student demographics and evolving workforce demands, the program

introduces specialized STEM training that equips students with the knowledge, skills, and competencies required in today's and future construction industry. By providing high-quality education at a Historically Black Institution, the program strengthens HBIs' capacity to educate underrepresented populations and enhances equitable access to a high-demand, innovative STEM field.

The program incorporates real-world learning experiences, including internships, project-based assignments, and emerging construction technologies such as modular construction and AI-enabled project management tools. These experiences reflect Priority 8's emphasis on innovation and risk-taking, preparing graduates to enter the workforce ready to contribute to regional economic development, sustainable infrastructure, and resilient construction practices.

UMES's significance is further underscored in Priority 5 of the 2022 *Maryland State Plan for Higher Education*: "The need to strengthen and expand the capacity of historically black colleges and universities to provide high-quality and unique educational programs."

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.

Graduates of the proposed B.S. in Construction Engineering program will be prepared for careers in industries such as construction, infrastructure, transportation, environmental engineering, and water resources engineering and management. These individuals will be qualified for entry-level to mid-level roles in private firms, government agencies, and nonprofit organizations, driven by the sustained demand for construction engineers across Maryland and the broader region.

Regional companies such as Whiting-Turner Contracting Company, DPR Construction, Harkins Builders, Inc., Davis, Bowen & Friedel, Inc., and Skanska USA Building, Inc., are representative of employers expected to hire graduates from the proposed program.

The Eastern Shore ASCE Branch has expressed strong support for this new program. The Eastern Shore Branch has members from Caroline, Dorchester, Kent, Queen Anne's, Somerset, Talbot, Wicomico, and Worcester counties. This local branch is prepared to work with students enrolled in the program by enhancing professional development, assisting them in the formation of a UMES

Student Chapter of ASCE, providing scholarship money, and providing opportunities for internships and later permanent employment.

Currently, graduates of the Construction Management Technology program at UMES, which also confers a Bachelor of Science degree, are working at the above-mentioned companies, as well as other small and large construction companies, both in Maryland and in the U.S., and are hired as project engineers, project managers, project superintendents, building inspectors, site managers, and safety managers. Graduates with bachelor's degrees normally start with entry-level positions.

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

Online statistical data for Construction Engineering and Management is usually divided into two categories: construction managers and construction engineers. These two fields blend the role of the Construction Engineering Manager who is involved from the project's inception and planning to building and opening the site.

According to the Bureau of Labor Statistics (BLS), the reported number of construction manager jobs in 2024 was 550,300, with a job outlook for 2024-2034 at 9%, which is much faster than average. The 2024 median annual wage was \$106,980 for employees with a typical entry-level education of a bachelor's degree (Bureau of Labor Statistics, U.S. Department of Labor, 2024, *Occupational outlook handbook: Construction managers*. <https://www.bls.gov/ooh/management/construction-managers.htm>).

The job search platform *Indeed* lists the following construction engineering and management jobs, along with their average salary, in the state of Maryland.

Position	Average Salary
Civil Construction Engineer	\$97,154
Project Manager Construction	\$98,441
Construction Manager	\$97,038
Civil Construction Operations Manager	\$110,567
MEP/Construction Engineer	\$127,964
Construction Estimator	\$91,666
Construction superintendent	\$95,859
Project Construction Engineer	\$73,511
Project Engineer (Heavy Civil Construction)	\$88,537
Quantity Surveyor / Construction Engineer	\$113,684
<i>Source:</i> https://www.indeed.com/career/salaries?from=gnav-homepage/salaries (Accessed Feb, 2026)	

Construction management-related occupations continue to demonstrate strong workforce demand in Maryland. According to the Maryland Higher Education Commission (MHEC), the occupation category of construction managers (bachelor’s degree level) recorded approximately 1,800 total new job postings in 2023 and is projected to generate 8,164 total new openings between 2022 and 2032 due to employment growth, labor force exits, and occupational transfers (Source: Maryland Higher Education Commission (MHEC), Appendix A for In-Demand Occupations, March 14, 2025: <https://mhec.maryland.gov/Documents/Workforce%20Needs%20Analysis/Appendix%20A%20DRAFT%20external%20%28March%2014%2c%202025%29.pdf>)

The table below includes all construction-related academic programs selected from the full set of academic programs, along with their corresponding occupation categories in Maryland, based on data from the Maryland Higher Education Commission (MHEC). The data indicates a limited supply of specialized bachelor’s-level graduates in Construction Management/Engineering -related fields. Across most construction-related programs—including construction engineering, construction project management, and construction engineering technology—no graduates were reported between 2019 and 2023. Only Construction Management (General) produced graduates among the three programs, with relatively small cohorts.

Notably, there is no Construction Engineering bachelor’s program reflected in the dataset during this period. While some occupations may also draw from broader disciplines not fully captured in this table, the overall pattern suggests a mismatch between strong labor market demand and the limited production of specialized construction-focused degrees in Maryland.

Occupation Category (All for bachelor’s degrees)	Academic Programs	Number of Degrees/Certificates Awarded					
		Number of Programs	2019	2020	2021	2022	2023
11-3013 Facilities Managers: 360 Avg. Annual Openings	CIP: 46.0412 Building/Construction Site Management/Manager.		0	0	0	0	0
11-9021 Construction Managers: 816 Avg. Annual Openings	CIP: 15.1001 Construction Engineering Technology/Technician.		0	0	0	0	0
	CIP: 52.2001 Construction Management, General.	3	21	22	27	18	16
	CIP: 52.2002 Construction Project Management.		0	0	0	0	0
	CIP: 52.2099 Construction Management, Other.		0	0	0	0	0
11-9041 Architectural and Engineering Managers: 388 Avg. Annual Openings	CIP: 14.3301 Construction Engineering.		0	0	0	0	0
13-1051 Cost Estimators: 368 Avg. Annual Openings	CIP: 14.3301 Construction Engineering.		0	0	0	0	0
	CIP: 15.1001 Construction Engineering Technology/Technician.		0	0	0	0	0

13-1082 Project Management Specialists: 3014 Avg. Annual Openings	CIP: 52.2002 Construction Project Management.		0	0	0	0	0
17-2051 Civil Engineers: 385 Avg. Annual Openings	CIP: 14.3301 Construction Engineering.		0	0	0	0	0
17-2199 Engineers, All Other: 439 Avg. Annual Openings	CIP: 14.3301 Construction Engineering.		0	0	0	0	0
Source: Maryland Higher Education Commission (MHEC), Appendix B for in-Demand programs, March 14, 2025: https://mhec.maryland.gov/Documents/Workforce%20Needs%20Analysis/Appendix%20B%20DRAFT%20external%20%28March%2014%2c%202025%29.pdf							

A study of the job market for construction managers <https://www.careerexplorer.com/careers/construction-manager/job-market/> “Career Explorer” reports 6,410 construction engineering jobs in Maryland, ranking the state 13th in the country for employment in this field. This data reflects the increasing demand for those in the construction industry with strong technical expertise to support infrastructure development and related initiatives.

With the current trends in population and business growth, coupled with the urgent need to improve the nation’s infrastructure, the U.S. economy requires more skilled construction workers and managers to support the creation of new and complex jobs. The proposed B.S. degree in Construction Engineering will provide students with the education and training they need to become valuable contributors to the construction industry, which maintains a strong force in the nation’s economy.

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 Bureau of Labor Statistics (BLS) is normally used for employment data and to determine market demand. Data is usually listed for construction managers or construction engineers (Retrieved Feb 21, 2025, from <https://www.bls.gov/ooh/management/construction-managers.htm>)

According to the BLS, there were 550,300 jobs for construction managers listed in 2024, with a projected 9% percent growth rate from 2024 to 2034 for construction engineers.

Based on the BLS projection, there will be about 46,800 job openings for construction managers each year, on average, over the decade. The career outlook is strong for those with an educational background and training in construction engineering and management.

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

Once the proposal is approved, the program will seek ABET accreditation after its first cohort graduates. ABET accreditation is essential to ensure the program meets industry standards, prepares students for successful careers, and enhances its reputation, attracting students, employers, and faculty.

According to the ABET website database for accredited programs (ABET, 2026), there are 14 institutions that offer Construction Engineering and Management programs, including 4 master's programs (all abroad) and 10 bachelor's programs within the United States. Additionally, 20 institutions are offering Construction Engineering programs, all at the bachelor's level, with 18 located across the United States. Institutions of higher learning in 6 East Coast states offer ABET-accredited Construction Engineering Programs, and the number of degrees awarded in the most recent data year, "College Factual" (www.collegefactual.com), is provided below:

Institutions	Location	# of Construction Engineering BS Degrees Awarded in 2020-2021
Georgia Southern University [Construction Engineering (BS.Con.E.)]	Statesboro, GA	6
North Carolina State University at Raleigh [Construction Engineering (BS)]	Raleigh, NC	15
The Citadel [Construction Engineering (BSCONE)]	Charleston, SC	6
University of Central Florida [Construction Engineering (Bachelor of Science in Construction Engineering)]	Orlando, FL	91
Virginia Polytechnic Institute and State University [Construction Engineering and Management (Bachelor of Science in Construction Engineering and Management)]	Blacksburg, VA	48
University of Delaware [Construction Engineering and Management (BCEM)]	Newark, DE	19

All of the programs listed above confer a Bachelor of Science degree, and none are offered at a historically Black institution. Offering this Bachelor of Science in Construction Engineering program at UMES allows the university to enhance diversity in the construction industry by increasing the number of HBCU graduates in this field. Establishing these programs on the Eastern Shore will serve as a geographic draw for potential students, address the current market demand for construction engineering graduates, and make a valuable contribution to the workforce in Maryland and the surrounding states.

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.**

According to the National Center for Education Statistics, there are currently no Bachelor of Science programs in Construction Engineering (CIP 14.3301) or Construction Engineering Technology (CIP 15.1001) offered in the state of Maryland (source:

<https://nces.ed.gov/collegenavigator/?s=MD&p=15.1001+14.3301&l=93>).

Within a 150-mile distance of Princess Anne, Maryland (ZIP Code 21853), only four institutions offer Construction Engineering or closely related programs, as summarized in the table below.

(source:<https://nces.ed.gov/collegenavigator/?s=all&zc=21853&zd=150&of=3&p=15.1001+14.3301&l=93>).

Notably, none of these programs are located in Maryland or on the Delmarva Peninsula, indicating a clear geographic gap in access to this field of study.

Institution	HBCU	City, State	Public/Private	Program Offered	Tuition and fees (2024-2025)	
					In-state	Out-of-state
Norfolk State University	Yes	Norfolk, VA	Public	Construction Engineering Technology	\$10,180	\$21,682
Temple University	No	Philadelphia, PA	Public	Construction Engineering Technology	\$23,011	\$38,958
Thomas Jefferson University	No	Philadelphia, PA	Private	Construction Engineering Technology	--	\$47,505
University of Delaware	No	Newark, DE	Public	Construction Engineering	\$16,810	\$41,400
University of Maryland Eastern Shore (UMES)*	Yes	Princess Anne, MD	Public	---	\$9,076	\$20,122

* UMES does not currently offer Construction Engineering; it is included for comparison purposes only.

The table below lists all academic programs or areas of concentration in the state of Maryland that include “Construction” in their titles. (Source: MHEC Institution Program Inventory, https://mhec.maryland.gov/institutions_training/pages/searchschool.aspx)

Institution	Frostburg State University	Loyola University Maryland	Morgan State University	University of Maryland, College Park	Capitol Technology University		University of Maryland Eastern Shore	
Public/Private	Public	Private	Public	Public	Private		Public	
Minority-Serving Status	--	--	HBCU	--	--		HBCU	
City, Region	Frostburg, Western MD	Baltimore, Central MD	Baltimore, Central MD	College Park, Central MD	Laurel, Central MD		Princess Anne, Eastern Shore	
Distance from UMES	274 mi	138 mi	139 mi	132 mi	133 mi		--	
Cost of Living compared to the Maryland Average ^{\$}	- 20% less (↓)	+5% more (↑)	+5% more (↑)	+10% more (↑)	+3% more (↑)		- 13% less (↓)	
Program title	Sustainable Construction Management (B.S.) [‡]	Construction Management and Real Estate Development (B.S.); AoC Construction Engineering [‡]	Construction Management (B.S.) [‡]	Civil Engineering; AoC Construction Engineering & Management (B.S.) [‡]	Construction Info Tech & Cybersecurity (B.S.) [‡]	Construction Management (B.S.) [‡]	Construction Management Technology (B.S.) [‡]	Construction Engineering (B.S.) [*]

CIP Code	309999	522001	522001	140801	110101	522001	151001	143301
Accreditation Status	Institutionally accredited, no separate program accreditation	Institutionally accredited, no separate program accreditation	Institutionally accredited, no separate program accreditation	ABET Accredited	Institutionally accredited, no separate program accreditation	Institutionally accredited, no separate program accreditation	ACCE Accredited	Will seek ABET Accreditation
Mode of Delivery	On-campus	On-campus	On-campus	On-campus	Online	Online & On-campus	On-campus	On-campus*
Approximate Department FT Faculty Size	2	~6-10	15	32	5	3	4 + One more will join Fall 2026	4 + One more will join Fall 2026
Enrollment Fall 2024**	20	new program, no data available	121	338 total CE students (no concentration-level data available)	0	3	46	--
Program size	Small	Small	Medium	Large	Small	Small	Small	Small
In-State Tuition and Fees per year (2025-2026) ††	\$10,464	--	\$8,346	\$12,290	--	--	\$9,365.50	\$9,365.50
Out-of-State Tuition and Fees per year (2025-2026) ††	\$26,356	\$59,150	\$19,456	\$42,053	\$28,258	\$28,258	\$20,910.50	\$20,910.50
Required Credits	121	120 (30 Crs. for AoC)	120	122 (15 Crs. for AoC)	121	121	125	120
Internship/Co-op Requirement	Internship required	Internship not required	Internship required	Internship not required	Internship not required	Internship required	2 Internships required	Internship required
Technical Elective Courses	--	--	4	1	--	--	--	1
Program similarities	All construction-related programs and concentrations in Maryland, including the current CMT program at UMES, include coursework in construction methods, materials, project management, scheduling, and legal aspects/contracts, providing a foundation in managing construction projects. Most programs also incorporate construction software and supporting coursework in mathematics, physics, economics, and business principles. In addition, many include experiential learning components such as internships, senior projects, or capstone experiences to prepare students for professional roles in construction and related fields.							
Program differences/Distinctions	This program focuses on sustainability, climate, and environmental impacts in construction. It blends geography and sustainable design with basic construction topics. It is more environmentally focused than technically engineering-oriented.	This program integrates engineering fundamentals with building systems through studio-based learning, combining statics, materials, MEP systems, smart technologies, and sustainability in a systems-based approach that blends engineering and architectural design.	This is a traditional construction management program focused on estimating, scheduling, contracts, and field operations. It includes some basic engineering, but is mainly project management and business-oriented.	This program is engineering-based and embedded within a civil engineering curriculum. It emphasizes construction project management, planning, estimating, BIM, and construction documentation alongside core engineering principles.	This online program combines construction with computer programming, networking, and cybersecurity. It includes BIM and construction software but is heavily IT-focused. It is more computer science-driven and less focused on construction engineering.	This is a traditional construction management program focused on estimating, scheduling, contracts, safety, and field operations. It combines business coursework with foundational engineering topics such as statics, materials, and environmental systems.	The existing Construction Management Technology program at UMES is primarily focused on the management and practical execution of construction projects, emphasizing skills such as estimating, scheduling, BIM, and project coordination.	The proposed Construction Engineering program would analyze, design, and engineer construction systems and infrastructure at a more technical and advanced level, with a stronger emphasis on engineering principles.

* Proposed program pending approval

**Source:<https://mhec.maryland.gov/publications/Documents/Research/AnnualReports/TRENDS%20IN%20ENROLLMENT%20BY%20PROGRAM%20-%20Fall%202024%20FINAL.pdf>

§ Economic Research Institute, Cost of living: <https://www.eri.com/cost-of-living/united-states/maryland>

†† Data collected from official university financial webpages:

Frostburg State University: <https://www.frostburg.edu/admissions-and-cost/undergraduate/tuition-and-aid.php>

Loyola University Maryland: <https://www.loyola.edu/department/financial-aid/undergraduate/tuition-price-affordability/>

Morgan State University: <https://www.morgan.edu/bursar/tuition-and-fees/fall-2025-spring-2026>

University of Maryland, College Park: <https://academiccatalog.umd.edu/undergraduate/fees-expenses-financial-aid/tuition-fees/>

Capitol Technology University: <https://www.captechu.edu/node/1596>

University of Maryland Eastern Shore: <https://www.wcp.umes.edu/comptroller/tuition-and-fees/>

‡ Link to the program curricula:

Frostburg State University, Sustainable Construction Management (B.S.): <https://www.frostburg.edu/academics/academic-success-network/8-semester-plans/2025-2026/sustainable-construction-management.php>

Loyola University Maryland, Construction Management and Real Estate Development (B.S.); AoC Construction Engineering: <https://www.loyola.edu/seller-business/academics/undergraduate/construction-management-and-real-estate-development.html>

Morgan State University, Construction Management (B.S.):

https://catalog.morgan.edu/preview_program.php?catoid=26&poid=6147&gl=1*bzlqv*ga*MTMzNDlyMTc5Ni4xNzc3MDQ5NTY4*ga_T3TCY7Q7D7*czE3NzkwMjM3NTAKbzEzJGcwJHQxNzc5MDIzNzUwJGo2MCRsMCRoMA..*ga_M0ZTGEV2NR*czE3NzkwMjM3NTAKbzEzJGcwJHQxNzc5MDIzNzUwJGo2MCRsMCRoMA..

University of Maryland, College Park, Civil Engineering; Aoc Construction Engineering & Management (B.S.): <https://pm.umd.edu/program/cpm-minor/>

Capitol Technology University, Construction Info Tech & Cybersecurity (B.S.): <https://www.captechu.edu/degrees-and-programs/bachelors-degrees/construction-information-technology-and-cybersecurity-bs#details>

Capitol Technology University, Construction Management (B.S.): <https://www.captechu.edu/degrees-and-programs/bachelors-degrees/construction-management-bs#details>

University of Maryland Eastern Shore, Construction Management Technology: <https://www.wcp.umes.edu/tech/wp-content/uploads/sites/94/2025/09/CMT-Flowchart-2025.pdf>

All existing construction-related programs in Maryland share a common set of courses in construction methods, materials, project management, scheduling, legal aspects/contracts, and supporting coursework in mathematics, physics, economics, and business principles. However, most programs are primarily management-focused, emphasizing planning, coordination, contracts, and field operations. Among the programs reviewed, only the University of Maryland, College Park (ABET Accredited), and the University of Maryland Eastern Shore (ACCE Accredited) currently offer accredited construction-related programs, distinguishing them from other institutions in the state. Furthermore, only two programs offer engineering-oriented concentrations: Loyola University Maryland's Construction Engineering Area of Concentration and the University of Maryland, College Park's Construction Engineering and Management Area of Concentration, both embedded within broader degree programs rather than offered as standalone Construction Engineering degrees.

In this context, there is currently no standalone B.S. in Construction Engineering in the state of Maryland, and the proposed B.S. in Construction Engineering at UMES would not duplicate existing programs. Additionally, UMES is a public HBCU serving Maryland's Eastern Shore and underrepresented communities, and the proposed program would address regional workforce needs and rural infrastructure challenges while maintaining engineering standards. Also, the cost of living in Princess Anne and the surrounding areas

is significantly lower than in Baltimore and College Park, positioning UMES as one of the most affordable public options for engineering education in the Delmarva Peninsula. This combination of lower tuition and reduced living expenses can improve access to engineering education for students from economically disadvantaged and underrepresented backgrounds who may otherwise face financial barriers to similar programs located across the Chesapeake Bay or in neighboring states.

The proposed program at the University of Maryland Eastern Shore (UMES) expands access to engineering education. As a Historically Black College and University (HBCU), UMES serves underrepresented and underserved populations, including first-generation and low-income students in the region.

According to the ABET official website, there is no accredited B.S. program in Construction Engineering offered in the State of Maryland (<https://amspub.abet.org/aps/name-search?searchType=program&keyword=construction%20engineering>).

Similar non-ABET accredited degrees offered within the state include:

- Morgan State University's "Construction Management (BS),"
- Capitol Technology University's "Construction Management (BS)" and "Technology and Business Management (BS)," and
- Loyola University's "Sustainability Management (BBA)."

These programs focus on the management and leadership aspects of construction, preparing students for roles in project management, scheduling, construction finance, and safety.

While they all prepare students for careers in construction, UMES's proposed program prioritizes engineering skills, offering a distinctive curriculum with specialized construction engineering courses designed to meet industry needs. Additionally, these programs have different outcomes from UMES, which has adopted ABET Engineering outcomes for its Construction Engineering program. Therefore, the proposed UMES program does not duplicate those offered by other Maryland institutions and can serve a broad geographical area and academic level.

As shown in the table, UMES also offers relatively low tuition for Maryland residents, making it a more affordable option for local students. Establishing this program will address both geographic and socioeconomic gaps by providing access to a high-quality, affordable engineering education close to home, without duplication of existing programs in the neighboring states.

2. Provide justification for the proposed program.

Construction engineering encompasses the planning, coordination, and execution of all phases of construction projects, including design, architecture, engineering, and construction of various projects such as homes, commercial buildings, roads, highways, bridges, and railroads. A construction engineer is involved from the project's inception and planning through to the construction and completion of the site.

This new program integrates business and engineering principles, equipping students to lead projects from start to finish. Students will be prepared for a successful career in the construction industry by gaining knowledge in basic science, engineering principles, technology, and business. Our construction engineering undergraduate program will provide students with the necessary tools to become professionals in all areas of the construction industry.

According to a 2025 industry report, the U.S. construction market reached approximately \$1.90 trillion in 2024 and is projected to grow to about \$2.92 trillion by 2034, driven by infrastructure investment, technological innovation, and demand for sustainable construction. (Source: Research and Markets. (2025). United States Construction Market Size Analysis Report – Market Share, Forecast Trends and Outlook.) CareerExplorer (n.d.) lists the need in Maryland for 6,460 construction engineering professionals with strong technical knowledge.

Of the four HBIs in Maryland, none of them offers a B.S. degree in construction engineering. Additionally, the construction industry continues to lack diversity, but companies are acknowledging this and starting to be more proactive in their hiring practices. By offering this degree at the University of Maryland Eastern Shore, this comprehensive curriculum will provide students from various ethnicities and backgrounds with the education and expertise needed to become valuable contributors to the construction industry. This will not only help the industry become more representative of the communities it serves but also support its need for greater diversity and inclusion.

This new B.S. in Construction Engineering program offers a unique curriculum, providing students with a solid foundation to meet the industry's needs while fostering a more diverse and inclusive workforce in the construction industry.

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.

With the boom in the construction industry following the Covid-19 pandemic recovery and federal legislation such as the *BUILD (Better Utilizing Investments to*

Leverage Development) Grants, there has been a higher demand for heavy construction, green buildings, and rapidly evolving technology, intensifying the need for a highly skilled construction workforce. (<https://www.transportation.gov/briefing-room/trumps-transportation-secretary-sean-p-duffy-announces-15-billion-infrastructure>)

Among the four Historically Black Institutions (HBIs) in Maryland, none currently offer a B.S. degree in Construction Engineering. The proposed Construction Engineering program at UMES will place the university at the forefront of this field in the tri-state area, enabling it to produce a highly qualified workforce to support the building industry in Maryland and across the nation.

While Morgan State University (HBI) offers a B.S. in Construction Management, which focuses on the managerial and leadership aspects of the construction industry, the UMES program is distinctly different. The UMES Construction Engineering program emphasizes technical and engineering principles, such as design, structural analysis, and construction materials, to prepare students for engineering roles in construction projects.

This distinction ensures that the UMES program does not overlap with Morgan State's program but instead complements it by addressing the engineering expertise needed in the industry. The two programs serve different educational needs and career paths, with UMES focusing on the engineering aspects and Morgan State focusing on management and leadership in construction.

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 ethnic distribution of students in the Department of the Built Environment is: Black 44.7%, White 8.5%, Asian 4.3%, Hispanic 17.0%, International 12.8%, and other 12.8% (University System of Maryland, 2024: <https://www.usmd.edu/IRIS/?view=UMES>).

The mission of UMES and the Department of the Built Environment is to provide educational opportunities for underrepresented minorities and first-generation college students, individuals who might not otherwise have a chance to earn a BS degree in Construction Engineering. The proposed Construction Engineering degree is designed to meet the accreditation criteria by the Accreditation Board for Engineering and Technology (ABET), ensuring academic rigor and quality.

G. Adequacy of Curriculum Design, Program Modality, and Related Learning Outcomes (as outlined in COMAR13B.02.03.10):

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

Curriculum Design: The proposed Bachelor of Science in Construction Engineering was developed by faculty within the Department of the Built Environment to meet the growing needs in the construction industry and the demand for skilled individuals. With the rise in construction as the U.S. economy recovers from the pandemic, major construction industry trends include building information modeling (BIM), construction robotics, and the use of advanced building materials. (Source: Construction 4.0 Strategic Business Research Report 2025). There is also the increased need to adhere to worker safety and regulations.

Faculty Oversight: The core courses in the proposed B.S. in Construction Engineering program will be taught by existing faculty in the Department of the Built Environment. In addition, the UMES Department of Engineering currently offers foundational courses that support several courses in the proposed curriculum. A listing of current faculty backgrounds is included in Section I.

Program Modality: The program will be offered in person at the University of Maryland Eastern Shore's main campus.

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

The Bachelor of Science in Construction Engineering program at the University of Maryland Eastern Shore is designed to prepare graduates for successful careers in construction engineering by equipping them with the knowledge and skills needed to address real-world engineering challenges. The Construction Engineering program produces graduates who are expected to achieve the following educational objectives within a few years after graduation:

Objective 1: Demonstrate technical competence as construction engineers in industry and government agencies or through the pursuit of advanced studies.

Objective 2: Collaborate effectively on engineering project teams in industry or government settings.

Objective 3: Contribute meaningfully as active and responsible professionals to the construction engineering field and its interaction with global society.

Objective 4: Engage in lifelong learning by continuously updating skills and knowledge to stay current with emerging tools, technologies, and best practices in Construction Engineering.

**Consistency of the
Program Educational Objectives with the Institutional Mission**

Program Educational Objectives	Institutional Mission Statement: As a public 1890 land-grant Historically Black University that embraces diversity, UMES is committed to serving first-generation and underserved students and providing educational, research, and community engagement opportunities to transform the lives of its students who will impact the state, region, and the world.
Objective 1: Demonstrate technical competence as construction engineers in industry and government agencies or through the pursuit of advanced studies.	UMES empowers first-generation and underserved students with the technical skills to excel in their careers and further studies.
Objective 2: Collaborate effectively on engineering project teams in industry or government settings.	UMES fosters diversity and teamwork, preparing students to work well in diverse professional environments.
Objective 3: Contribute meaningfully as active and responsible professionals to the construction engineering field and its interaction with global society.	UMES transforms students into responsible professionals who make positive impacts locally and globally.
Objective 4: Engage in lifelong learning by continuously updating skills and knowledge to stay current with emerging construction engineering tools, technologies, and best practices in Construction Engineering.	UMES provides research and learning opportunities to ensure students stay current with evolving technologies in the field.

Students' Learning Outcomes:

Graduates of the Bachelor of Science in Construction Engineering program will demonstrate the following learning outcomes:

1. An ability to identify, formulate, and solve complex engineering problems by applying principles of engineering, science, and mathematics.
2. An ability to apply engineering design to produce solutions that meet specified needs with consideration of public health, safety, and welfare, as well as global, cultural, social, environmental, and economic factors.
3. An ability to communicate effectively with a range of audiences.
4. An ability to recognize ethical and professional responsibilities in engineering situations and make informed judgments, which must

consider the impact of engineering solutions in global, economic, environmental, and societal contexts.

5. An ability to function effectively on a team whose members together provide leadership, create a collaborative and inclusive environment, establish goals, plan tasks, and meet objectives.
6. An ability to develop and conduct appropriate experimentation, analyze and interpret data, and use engineering judgment to draw conclusions.
7. An ability to acquire and apply new knowledge as needed, using appropriate learning strategies.

Relationship of Student Outcomes to Program Educational Objectives

Student Learning Outcomes	Program Educational Objectives			
	Objective 1: Demonstrate technical competence as construction engineers in industry and government agencies or through the pursuit of advanced studies.	Objective 2: Collaborate effectively on engineering project teams in industry or government settings.	Objective 3: Contribute as active and responsible professionals to the construction engineering field and its interaction with global society.	Objective 4: Continuously updating skills and knowledge to stay current with advancing construction engineering tools and technologies.
1. An ability to identify, formulate, and solve complex engineering problems by applying principles of engineering, science, and mathematics.	✓			
2. An ability to apply engineering design to produce solutions that meet specified needs with consideration of public health, safety, and welfare, as well as global, cultural, social, environmental, and economic factors.	✓		✓	
3. An ability to communicate effectively with a range of audiences.		✓		
4. An ability to recognize ethical and professional responsibilities in engineering situations and make informed judgments, which must consider the impact of engineering solutions in global, economic, environmental, and societal contexts.			✓	
5. An ability to function effectively on a team whose members together provide leadership, create a collaborative and inclusive environment, establish goals, plan tasks, and meet objectives.		✓		
6. An ability to develop and conduct appropriate experimentation, analyze and interpret data, and use engineering judgment to draw conclusions.	✓			
7. An ability to acquire and apply new knowledge as needed, using appropriate learning strategies.	✓	✓		✓

Rubrics aligned with the learning outcomes will be developed and implemented by faculty to assess a student's progress throughout the program. These outcomes will be used to effectively evaluate the overall success of the Construction Engineering program.

3. Explain how the institution will:**a) Provide for assessment of student achievement of learning outcomes in the program**

Assessment methods based on established departmental standards will include the following:

- **Assessing written student reports** and oral presentations, as well as individual, team, and/or senior design projects.
- **Evaluating student performance** through assignments, quizzes, and exams, in required major courses.
- **Administering surveys** to students, alumni, and industry partners to gather feedback on the program's effectiveness and its alignment with current industry needs and expectations.

b) Document student achievement and learning outcomes in the program.

The department will document student achievement of the learning outcomes in the Construction Engineering program in the same manner as its currently accredited Construction Management Technology program. For instance, in that program, based on American Council for Construction Education (ACCE) requirements, student work, project evaluations, surveys, and feedback from industry partners are used to assess and document the achievement of these outcomes. Assessment of learning outcomes for the newly proposed program will be conducted every six years per ABET accreditation requirements once accredited.

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

The Bachelor of Science in Construction Engineering program requires successful completion of 120 credit hours. The curriculum includes 39 credit hours of general education courses in English, arts and humanities, social and behavioral sciences, and discipline-specific courses. Students will complete 59 credit hours of core construction engineering courses (56 required and 3 electives). Additionally, the program includes 22 credit hours of supportive courses in mathematics, science, business, and computer science, which are integrated into the requirements for the Construction Engineering major. A complete list of courses, including titles, semester credit hours, and descriptions, is provided below:

Bachelor of Science in Construction Engineering

<u>Category</u>	<u>Distribution</u>
I. General Education Courses	39 credit hours
II. Supportive Math/Science/Business/Computer Courses	22 credit hours
III. Core Required Courses	56 credit hours
IV. Core Elective Courses	3 credit hours
120 credit hours	

Curriculum of Bachelor of Science in Construction Engineering

General Education		39 credits needed
<u>Course Code</u>	<u>Course Title</u>	<u>Credit Hours</u>
GEP Area 1: Arts and Humanities		6 credit hours
ARTS 101, ARTS 310, ARAB 101, ASLS 203, CHIN 101, ENGL 204, ENGL 205, ENGL 206, ENGL 207, FREN 101, HIND 101, HONR 101, JAPN 101, KORE 101, PORT 101, SPAN 101, THAR 101	Elective Arts and Humanities [NP]	3 hrs
ENGL 203	Fundamentals of Contemporary Speech [PR: ENGL 101, ENGL 102]	3 hrs
GEP Area 2: Social and Behavioral Sciences		6 credit hours
ECON 201	Principles of Economics (Macro) [PR: MATH 102 or Higher]	3 hrs
CRJS 101, ECON 202, GEOG 201, GEOG 202, HIST 101, HIST 102, HIST 201, HIST 202, HONR 201, HUEC 203, HUEC 220, HUEC 361, PHIL 201, PHIL 202, POLI 200, POLI 220, POLI 342, PSYC 100, SOCI 101, SOCI 201	Elective Social and Behavioral Sciences [PR: As specified by the selected course]	3 hrs
GEP Area 3: Biological and Physical Sciences		7 credit hours
ENVS 101	Introduction to Environmental Sciences [NP]	3 hrs
PHYS 161	General College Physics I [PR: MATH 112/CR: PHYS 163]	3 hrs
PHYS 163	General College Physics I Laboratory [CR: PHYS 161]	1 hr
GEP Area 4: Math		4 credit hours
MATH 112	Calculus I [PR: MATH 110]	4 hrs

GEP Area 5: English Composition		9 credit hours
ENGL 101	Principles of Composition I [NP]	3 hrs
ENGL 102	Principles of Composition II [PR: ENGL 101]	3 hrs
ENGL 305, ENGL 310	Technical Writing [PR: ENGL 101, ENGL 102, ENGL 203], or Advanced Composition [PR: ENGL 101, ENGL 102]	3 hrs
GEP Area 6: Institution-Specific Courses		7 credit hours
ENGE 100	First-Year Orientations with Engineering [NP]	1 hr
BUAD 213	Business Software Applications [NP]	3 hrs
BUAD 311	Justice and Diversity in Organizations [PR: ENGL 102]	3 hrs

Supportive Math/Science/Business/Computer Courses		22 credits needed
<u>Course Code</u>	<u>Course Title</u>	<u>Credit Hours</u>
CHEM 111	Principles of Chemistry I [CR: CHEM 113]	3 hrs
CHEM 113	Principles of Chemistry I Laboratory [CR: CHEM 111]	1 hr
CSDP 120	Introduction to Computer Programming [PR: MATH 110]	3 hrs
MATH 211	Calculus II [PR: MATH 112]	4 hrs
MATH 212	Calculus III [PR: MATH 211]	4 hrs
MATH 241	Differential Equations [PR: MATH 211]	3 hrs
PHYS 262	General College Physics II [PR: PHYS 161, PHYS 163/CR: PHYS 264]	3 hrs
PHYS 264	General College Physics II Laboratory [CR: PHYS 262]	1 hr

Core Required Courses		56 credits needed
<u>Course Code</u>	<u>Course Title</u>	<u>Credit Hours</u>
CENG 201	Engineering Graphics [NP]	3 hrs
CENG 214	Surveying and Geomatics [PR: CENG 201, MATH 112]	3 hrs
CENG 230	Construction Materials [PR: CHEM 111, PHYS 161]	3 hrs
CENG 310	Structural Analysis [PR: ENGE 362, MATH 241]	3 hrs
CENG 325	Construction Methods and Equipment [PR: CENG 201, CENG 230, PHYS 262]	3 hrs
CENG 350	Fluid Mechanics and Hydraulics [PR: MATH 241, PHYS 161]	3 hrs
CENG 363	Properties and Mechanics of Materials Lab [PR: CENG 230/CR: ENGE 362]	1 hr
CENG 386	Construction Planning and Scheduling [PR: CENG 230, ENGE 320]	3 hrs
CENG 395	Internship [PR: Junior Standing, Permission of Instructor]	1 hr
CENG 410	Structural Steel Design [PR: CENG 310]	3 hrs
CENG 412	Reinforced Concrete Design [PR: CENG 310]	3 hrs

CENG 420	Construction Engineering Systems [PR: CENG 386, ENGE 320]	3 hrs
CENG 425	Construction Project Management [PR: CENG 325, CENG 386]	3 hrs
CENG 427	Soil Mechanics and Foundation Engineering [PR: CHEM 111, CENG 230, ENGE 362]	3 hrs
CENG 440	Construction Safety and Health Management [PR: CENG 425]	3 hrs
CENG 445	Construction Cost Estimating and Control [PR: CENG 201, CENG 230]	3 hrs
CENG 458	Construction Engineering Design Project [PR: Senior Standing, CENG 425, CENG 445]	3 hrs
ENGE 260*	Statics [PR: MATH 112]	3 hrs
ENGE 320*	Statistics and Probability for Engineers [PR: MATH 211]	3 hrs
ENGE 362*	Mechanics of Materials [PR: ENGE 260, MATH 211]	3 hrs

Core Elective Courses		3 credits needed
<u>Course Code</u>	<u>Course Title</u>	<u>Credit Hours</u>
CENG 305	Engineering Economy [PR: ECON 201, ENGE 320]	3 hrs
CENG 320	Introduction to Environmental Engineering [PR: CHEM 111, ENVS 101]	3 hrs
CENG 326	Mechanical and Electrical Building Systems [PR: CENG 201, MATH 112, PHYS 262]	3 hrs
CENG 330	Introduction to Transportation Engineering [PR: CENG 214, ENGE 320, PHYS 161]	3 hrs
CENG 360	Introduction to Wind Energy and Turbine Technology [PR: MATH 212, PHYS 262]	3 hrs
CENG 416	Water and Wastewater Treatment [PR: CHEM 111]	3 hrs
CENG 430	Highway Engineering [PR: CENG 310, CENG 330]	3 hrs
CENG 450	Sustainable Design and Construction [PR: Senior Standing, CENG 230]	3 hrs
CENG 499	Undergraduate Research Project [PR: Senior Standing, Permission of Instructor, Approval of Department Chair]	1-6 hrs
ENGE 370*	Computational Methods in Engineering [PR: MATH 211/CR: MATH 241]	3 hrs

Abbreviations: NP-No Prerequisites, PR-Prerequisite, CR-Corequisite

Note: *The following four (4) courses are cross listed in the existing engineering programs: ENGE 260, ENGE 320, ENGE 362, and ENGE 370. This cross-listing enables the current faculty to contribute to course delivery for the proposed Construction Engineering program.

Based on the ABET accreditation guidelines and as outlined in the table below, the curriculum includes 30 credit hours of mathematics and basic sciences, 59 semester credit hours of engineering topics, 22 credit hours of general education, and 9 credit hours of business and computer courses.

ABET Curriculum Breakdown by Credit Hours

General Education		39 credits needed	Math & Basic Sciences	Engineering Topics	General	Business /Computer
Course Code	Course Title	Credit Hours				
GEP Area 1: Arts and Humanities		6 credit hours				
ARTS 101, ARTS 310, ARAB 101, ASLS 203, CHIN 101, ENGL 204, ENGL 205, ENGL 206, ENGL 207, FREN 101, HIND 101, HONR 101, JAPN 101, KORE 101, PORT 101, SPAN 101, THAR 101	Elective Arts and Humanities	3			✓	
ENGL 203	Fundamentals of Contemporary Speech	3			✓	
GEP Area 2: Social and Behavioral Sciences		6 credit hours				
ECON 201	Principles of Economics (Macro)	3				✓
CRJS 101, ECON 202, GEOG 201, GEOG 202, HIST 101, HIST 102, HIST 201, HIST 202, HONR 201, HUEC 203, HUEC 220, HUEC 361, PHIL 201, PHIL 202, POLI 200, POLI 220, POLI 342, PSYC 100, SOCI 101, SOCI 201	Elective Social and Behavioral Sciences	3			✓	
GEP Area 3: Biological and Physical Sciences		7 credit hours				
ENVS 101	Introduction to Environmental Sciences	3	✓			
PHYS 161	General College Physics I	3	✓			
PHYS 163	General College Physics I Laboratory	1	✓			
GEP Area 4: Math		4 credit hours				
MATH 112	Calculus I	4	✓			
GEP Area 5: English Composition		9 credit hours				
ENGL 101	Principles of Composition I	3			✓	

ENGL 102	Principles of Composition II	3			✓	
ENGL 305, ENGL 310	Technical Writing, or Advanced Composition	3			✓	
GEP Area 6: Institution-Specific Courses		7 credit hours				
ENGE 100	First-Year Orientations with Engineering	1			✓	
BUAD 213	Business Software Applications	3				✓
BUAD 311	Justice and Diversity in Organizations	3			✓	
Supportive Math/Science/Business/Computer Courses		22 credits needed				
Course Code	Course Title	Credit Hours				
CHEM 111	Principles of Chemistry I	3	✓			
CHEM 113	Principles of Chemistry I Laboratory	1	✓			
CSDP 120	Introduction to Computer Programming	3				✓
MATH 211	Calculus II	4	✓			
MATH 212	Calculus III	4	✓			
MATH 241	Differential Equations	3	✓			
PHYS 262	General College Physics II	3	✓			
PHYS 264	General College Physics II Laboratory	1	✓			
Core Required Courses		56 credits needed				
Course Code	Course Title	Credit Hours				
CENG 201	Engineering Graphics	3		✓		
CENG 214	Surveying and Geomatics	3		✓		
CENG 230	Construction Materials	3		✓		
CENG 310	Structural Analysis	3		✓		
CENG 325	Construction Methods and Equipment	3		✓		
CENG 350	Fluid Mechanics and Hydraulics	3		✓		
CENG 363	Properties and Mechanics of Materials Lab	1		✓		
CENG 386	Construction Planning and Scheduling	3		✓		
CENG 395	Internship	1		✓		
CENG 410	Structural Steel Design	3		✓		
CENG 412	Reinforced Concrete Design	3		✓		
CENG 420	Construction Engineering Systems	3		✓		
CENG 425	Construction Project Management	3		✓		
CENG 427	Soil Mechanics and Foundation Engineering	3		✓		
CENG 440	Construction Safety and Health Management	3		✓		

CENG 445	Construction Cost Estimating and Control	3		✓		
CENG 458	Construction Engineering Design Project	3		✓		
ENGE 260	Statics	3		✓		
ENGE 320	Statistics and Probability for Engineers	3		✓		
ENGE 362	Mechanics of Materials	3		✓		
Core Elective Courses		3 credits		✓		
Course Code	Course Title	Credit Hours				
CENG 305	Engineering Economy	3				
CENG 320	Introduction to Environmental Engineering	3				
CENG 326	Mechanical and Electrical Building Systems	3				
CENG 330	Introduction to Transportation Engineering	3				
CENG 360	Introduction to Wind Energy and Turbine Technology	3				
CENG 416	Water and Wastewater Treatment	3				
CENG 430	Highway Engineering	3				
CENG 450	Sustainable Design and Construction	3				
CENG 499	Undergraduate Research Project	1-6				
ENGE 370	Computational Methods in Engineering	3				
	TOTAL	120	30	59*	22	9

*Note: The 59 total credits include choosing 3 hours from the list of electives at the end of the chart.

Semester-by-Semester Plan Outline**Total credits: 120 credits****Freshman Year: 32 credits****Fall: 15 credits**

- GEP Elective Arts and Humanities (3 Credits)
- CHEM 111 Principles of Chemistry I (3 Credits)
- CHEM 113 Principles of Chemistry I Laboratory (1 Credit)
- ENGE 100 First-Year Orientations with Engineering (1 Credit)
- ENGL 101 Principles of Composition I (3 Credits)
- MATH 112 Calculus I (4 Credits)

Spring: 17 credits

- CSDP 120 Introduction to Computer Programming (3 Credits)
- ENGL 102 Principles of Composition II (3 Credits)
- ENVS 101 Introduction to Environmental Sciences (3 Credits)
- MATH 211 Calculus II (4 Credits)
- PHYS 161 General College Physics I (3 Credits)
- PHYS 163 General College Physics I Laboratory (1 Credit)

Sophomore Year: 32 credits**Fall: 17 credits**

- CENG 201 Engineering Graphics (3 Credits)
- ECON 201 Principles of Economics (Macro) (3 Credits)
- ENGE 260 Statics (3 Credits)
- MATH 212 Calculus III (4 Credits)
- PHYS 262 General College Physics II (3 Credits)
- PHYS 264 General College Physics II Laboratory (1 Credit)

Spring: 15 credits

- CENG 214 Surveying and Geomatics (3 Credits)
- CENG 230 Construction Materials (3 Credits)
- GEP Elective Social and Behavioral Sciences (3 Credits)
- ENGL 203 Fundamentals of Contemporary Speech (3 Credits)
- MATH 241 Differential Equations (3 Credits)

Junior Year: 32 credits**Fall: 16 credits**

- BUAD 213 Business Software Applications (3 Credits)
- CENG 325 Construction Methods and Equipment (3 Credits)
- CENG 363 Properties and Mechanics of Materials Lab (1 Credit)
- ENGE 320 Statistics and Probability for Engineers (3 Credits)
- ENGE 362 Mechanics of Materials (3 Credits)
- ENGL 305/310 Technical Writing or Advanced Composition (3 Credits)

Spring: 15 credits

- BUAD 311 Justice and Diversity in Organizations (3 Credits)
- CENG 310 Structural Analysis (3 Credits)
- CENG 350 Fluid Mechanics and Hydraulics (3 Credits)
- CENG 386 Construction Planning and Scheduling (3 Credits)
- CENG 445 Construction Cost Estimating and Control (3 Credits)

Summer: 1 credit

- CENG 395 Internship (1 Credit)

Senior Year: 24 credits**Fall: 12 credits**

- CENG 410 Structural Steel Design (3 Credits)
- CENG 420 Construction Engineering Systems (3 Credits)
- CENG 425 Construction Project Management (3 Credits)
- CENG 427 Soil Mechanics and Foundation Engineering (3 Credits)

Spring: 12 credits

- CENG 412 Reinforced Concrete Design (3 Credits)
- CENG 440 Construction Safety and Health Management (3 Credits)
- CENG 458 Construction Engineering Design Project (3 Credits)
- ELECT Core Elective Course (3 Credits)

CONSTRUCTION ENGINEERING CORE AND ELECTIVE COURSE DESCRIPTIONS – Bachelor of Science Degree

CENG 201 Engineering Graphics: 3 credits (2 Lecture hours, 2 Lab hours). This course focuses on the principles of engineering graphics and their application in technical design and communication. Topics include orthographic projection, isometric drawings, computer-aided drafting (CAD) techniques, and the interpretation of technical drawings and blueprints. Students will gain proficiency in geometric construction, sectional and auxiliary views, and proper dimensioning techniques, with an emphasis on industry standards and best practices. The course also covers the use of CAD libraries containing pre-drawn components to enhance drafting efficiency. By the end of the course, students will be able to communicate design concepts effectively through professional engineering drawings. [No prerequisites needed.]

CENG 214 Surveying and Geomatics: 3 credits (1 Lecture hour, 4 Lab hours). This course introduces the fundamental principles and practices of surveying and geomatics. Topics include distance and angle measurement, leveling, topographic mapping, traverse and area computations, horizontal and vertical curves, cross sections, triangulation, state plane coordinates, and global positioning systems (GPS). Students will learn data collection, analysis, and mapping techniques, including creating topographic maps and layout plans. The course emphasizes the use of computer applications for solving typical field and class problems. A concurrent lab provides hands-on experience with surveying techniques and equipment. [Prerequisites: CENG 201: Engineering Graphics, MATH 112: Calculus I]

CENG 230 Construction Materials: 3 credits (2 Lecture hours, 2 Lab hours). This course covers the fundamental concepts of materials science, focusing on the structure and properties of materials and their relationship to material selection and design. Topics include the classification and mechanical properties of construction materials such as soils, aggregates, cement, concrete, metals, wood, asphalt, composites, and new materials. Students will learn mix-design procedures for Portland cement concrete and bituminous/asphalt mixtures, as well as quality control and assurance practices in construction materials. The course also focuses on testing material properties and evaluating performance following established industry standards. [Prerequisites: CHEM 111: Principles of Chemistry I, PHYS 161: General College Physics I]

CENG 305 Engineering Economy: 3 credits (3 Lecture hours, 0 Lab hours). This course introduces the principles of economic analysis as applied to engineering decision-making. Topics include the time value of money, interest rates, present and future value calculations, cost-benefit analysis, break-even analysis, and the economic evaluation of alternative projects. Students will learn how to apply economic concepts to construction engineering problems, including project budgeting, investment decisions, and financial planning. The course also covers inflation, depreciation, tax considerations, and risk analysis in project evaluation. Monte Carlo simulation techniques are employed throughout the course to study variability in engineering designs and assess their economic impact. Emphasis is placed on developing the skills necessary to make informed, cost-effective decisions in engineering

practice. [Prerequisites: ECON 201: Principles of Economics (Macro), ENGE 320: Statistics and Probability for Engineers]

CENG 310 Structural Analysis: 3 credits (3 Lecture hours, 0 Lab hours). This course provides a study of the principles and methods used to analyze the behavior of structures under various loads. Topics include static equilibrium, internal forces, shear and bending moment diagrams, axial loads, torsion, and analysis of determinate trusses, frames, and beams. The calculation of deflections and the effects of moving loads are covered, as well as approximate methods to analyze indeterminate beams and frames. [Prerequisites: ENGE 362: Mechanics of Materials, MATH 241: Differential Equations]

CENG 320 Introduction to Environmental Engineering: 3 credits (3 Lecture hours, 0 Lab hours). This course covers the principles and practices of environmental engineering, including mass balance, rainfall and runoff analysis, surface water and groundwater hydrology, water and wastewater treatment, air pollution control, solid and hazardous waste management, and environmental impact assessment. The role of the U.S. Environmental Protection Agency (EPA) in environmental protection is examined. Topics also include sustainable technologies, regulatory frameworks, and the role of engineers in addressing environmental challenges. Emphasis is placed on applying engineering principles to solve environmental problems and improve public health and safety. [Prerequisites: CHEM 111: Principles of Chemistry I, ENVS 101: Introduction to Environmental Sciences]

CENG 325 Construction Methods and Equipment: 3 credits (3 Lecture hours, 0 Lab hours). This course covers the methods and equipment used in construction projects. Topics include excavation, material handling, lifting operations, formwork, and machinery for grading, trenching, and road construction. Emphasis is placed on the selection, application, and production of appropriate equipment for various construction tasks, with a focus on sustainability, as well as the economic and environmental considerations in equipment selection and operation. Students will also explore construction methods for foundations, superstructures, and infrastructure. [Prerequisites: CENG 201: Engineering Graphics, CENG 230: Construction Materials, PHYS 262: General College Physics II]

CENG 326 Mechanical and Electrical Building Systems: 3 credits (3 Lecture hours, 0 Lab hours). This course examines building mechanical and electrical systems from the construction manager's point of view. The course will review how the basic design calculations are performed to determine how building systems are selected and designed, review design documents including drawings and specifications, how the subcontractor bid packages are determined, purchasing of subcontracts, review of the shop drawing process, review of the mechanical systems shop drawing coordination process, construction of systems, turn-on and energization, start-up, testing, systems balancing, commissioning of systems, final turn-over, training demonstration to the owner, and close-out Operations. [Prerequisites: CENG 201: Engineering Graphics, MATH 112: Calculus I, PHYS 262: General College Physics II]

CENG 330 Introduction to Transportation Engineering: 3 credits (3 Lecture hours, 0 Lab hours). This course introduces the fundamental principles of transportation

engineering, including transportation systems planning, design, operation, and management. Topics include traffic flow theory, transportation safety, and an overview of different modes of transportation. Students will also learn about transportation demand forecasting, capacity analysis, and the environmental and economic impacts of transportation projects. [Prerequisites: CENG 214: Surveying and Geomatics, ENGE 320: Statistics and Probability for Engineers, PHYS 161: General College Physics I]

CENG 350 Fluid Mechanics and Hydraulics: 3 credits (2 Lecture hours, 2 Lab hours). This course introduces the fundamental principles of fluid mechanics and their practical applications, applicable to civil and construction engineering disciplines. Topics include the properties of fluids, fluid statics and dynamics, flow measurement, Bernoulli's equation, and the analysis of open channel and pipe flow. Students will learn about flow rate, pressure, velocity, energy losses, and fluid resistance in various systems. The course also covers hydraulic systems, pumps, and valves, as well as their applications in water distribution, stormwater management, and wastewater systems. Emphasis is placed on practical applications and the design of fluid systems in construction projects. The laboratory component provides hands-on experience in fluid property measurements, flow visualization, and hydraulic experiments. [Prerequisites: MATH 241: Differential Equations, PHYS 161: General College Physics I]

CENG 360 Introduction to Wind Energy and Turbine Technology: 3 credits (3 Lecture hours, 0 Lab hours). This course introduces students to the fundamentals of wind turbine mechanical systems, including wind energy potential and application to power generation. Topics include wind energy principles, wind site assessment, wind turbine components, power generation machinery, control systems, connection to the electric grid, and maintenance. The course will reinforce theoretical topics through relevant case studies and practical examples. [Prerequisites: MATH 212: Calculus III, PHYS 262: General College Physics II]

CENG 363 Properties and Mechanics of Materials Lab: 1 credit (0 Lecture hours, 2 Lab hours). This laboratory course provides practical experience in testing and analyzing the mechanical and physical properties of engineering materials. Experiments include tensile, compression, hardness, and impact testing, as well as microstructure examination and fracture analysis. Students will learn to apply fundamental concepts of material behavior, use modern testing equipment, analyze experimental data, and prepare technical reports. [Prerequisites: CENG 230: Construction Materials/CR: ENGE 362: Mechanics of Materials]

CENG 386 Construction Planning and Scheduling: 3 credits (3 Lecture hours, 0 Lab hours). This course covers the application of a variety of construction planning and scheduling methods. They include arrow and precedence networks using the Critical Path Method (CPM), Gantt charts and S-curves, resource allocation and resource leveling, time-cost tradeoffs, scheduling updating, C/SCSC and earned value systems, linear scheduling, and PERT and computer scheduling software applications. [Prerequisites: CENG 230: Construction Materials, ENGE 320: Statistics and Probability for Engineers]

CENG 395 Internship: 1 credit (120 Work hours). This course provides students with practical work experience with an approved employer in the civil or construction engineering field. A minimum of 120 documented contact hours with the selected employer is required. The course allows students to apply classroom knowledge in real-world engineering and construction settings, gaining hands-on experience and exposure to industry practices. [Prerequisites: Junior Standing, Permission of Instructor]

CENG 410 Structural Steel Design: 3 credits (3 Lecture hours, 0 Lab hours). This course covers the properties of structural steel, followed by the design of structural elements in steel buildings. Topics include the design of tension members, compression members, beams, beam-columns, and connections using the AISC (American Institute of Steel Construction) Load and Resistance Factor Design (LRFD) specifications. The course also covers construction techniques, along with the economic and safety considerations involved in the design and construction of steel structures. [Prerequisites: CENG 310: Structural Analysis].

CENG 412 Reinforced Concrete Design: 3 credits (3 Lecture hours, 0 Lab hours). This course covers the properties of concrete materials and reinforcing steel, as well as design approaches and structural loading. It introduces ACI (American Concrete Institute) Building Code requirements for reinforced concrete design. Topics include the design of beams, slabs, columns, and footings using ultimate strength design principles. The course also addresses serviceability considerations such as short- and long-term deflections, crack control, as well as bond, development lengths, and splices. [Prerequisites: CENG 310: Structural Analysis]

CENG 416 Water and Wastewater Treatment: 3 credits (3 Lecture hours, 0 Lab hours). This course covers the fundamental principles and processes involved in water and wastewater treatment. Topics include water quality parameters, physical, chemical, and biological treatment methods, water purification, disinfection, sludge treatment, and emerging technologies in water and wastewater management. Students will also learn about regulatory standards, environmental considerations, and sustainability practices in treatment facility design and operation. [Prerequisites: CHEM 111: Principles of Chemistry I]

CENG 420 Construction Engineering Systems: 3 credits (3 Lecture hours, 0 Lab hours). This course introduces key management concepts applied in construction engineering projects. Topics include principles of economics and business operations, with a focus on effective communication strategies and leadership within engineering teams. Students will explore decision-making processes, optimization methods, and their application in construction projects. The course also covers engineering management principles and cost control techniques, emphasizing how these concepts integrate to ensure the efficient planning, execution, and monitoring of construction projects. [Prerequisites: CENG 386: Construction Planning and Scheduling, ENGE 320: Statistics and Probability for Engineers]

CENG 425 Construction Project Management: 3 credits (3 Lecture hours, 0 Lab hours). This course covers the principles, theories, methods, and quantitative tools for the effective management of construction projects. Major topic areas of study include project

management principles and ethics; project life cycle phases and organizational structuring; project estimates, network-based systems, constructability, and value engineering; project procurement management; cost engineering, accounting, and cost control; and risk management and safety issues. Additionally, the course covers the ethical responsibilities and legal implications that come with licensure, especially in the context of project oversight. [Prerequisites: CENG 325: Construction Methods and Equipment, CENG 386: Construction Planning and Scheduling]

CENG 427 Soil Mechanics and Foundation Engineering: 3 credits (2 Lecture hours, 2 Lab hours). This course covers the principles of soil mechanics and their application in foundation engineering. Topics include the mechanical and physical properties of soils, classification, and behavior under different loading conditions. The course explores soil exploration techniques, compaction, consolidation, settlement, permeability, and shear strength tests. It also addresses bearing capacity, stress distribution, and lateral earth pressure, as well as the analysis and design of shallow and deep foundations and earth-retaining structures. The laboratory component includes hands-on testing and analysis of soil properties to reinforce the theoretical concepts covered in the course. [Prerequisites: CHEM 111: Principles of Chemistry I, CENG 230: Construction Materials, ENGE 362: Mechanics of Materials]

CENG 430 Highway Engineering: 3 credits (3 Lecture hours, 0 Lab hours). This course focuses on the design, construction, and maintenance of highway systems. Topics include geometric design, materials selection, pavement design, traffic analysis, intersection design, drainage systems, earthwork, and highway maintenance. Students will apply engineering principles to evaluate and design various components of highways, considering factors such as safety, efficiency, and environmental impact. [Prerequisites: CENG 310: Structural Analysis, CENG 330: Introduction to Transportation Engineering]

CENG 440 Construction Safety and Health Management: 3 credits (3 Lecture hours, 0 Lab hours). Construction safety and health management is a proactive process involving the identification of potential safety and health hazards, assessing the risks associated with those hazards, and implementing measures to mitigate, control, or eliminate them. Major topics covered in this course include safety administration, worker's compensation insurance, accident prevention programs, OSHA standards and compliance requirements, and the use of both qualitative and quantitative risk analysis in safety management. The course also explores professional ethics in the context of safety, emphasizing the role of ethical decision-making in ensuring worker safety and compliance with industry standards. [Prerequisites: CENG 425: Construction Project Management]

CENG 445 Construction Cost Estimating and Control: 3 credits (3 Lecture hours, 0 Lab hours). This course covers the creation of construction project cost estimates and bid proposals for both public and private sector projects. Topics include professional ethics, types of project cost estimates and their uses, life cycle costing, and the analysis and determination of materials, labor, and equipment costs. The course also addresses subcontracting, direct and indirect overhead costs, and profits. Additionally, students will

explore the use of spreadsheets and cost-estimating software applications to enhance accuracy and efficiency in cost estimation and control. [Prerequisites: CENG 201: Engineering Graphics, CENG 230: Construction Materials]

CENG 450 Sustainable Design and Construction: 3 credits (3 Lecture hours, 0 Lab hours). This course is the study of sustainable construction techniques and best practices. It provides an understanding of the independence between planning, designing, building, operating, and demolishing the built environment and their impacts on the natural environment. Course topics will include: 1) issues of resource efficiency, economics, ethics, waste, human health, environmental justice, and industrial ecology; 2) alternative practices that significantly reduce adverse environmental impacts of built infrastructure; and 3) exploration of past and present thinking of engineering practitioners in this newly emerging discipline. [Prerequisites: Senior Standing, CENG 230: Construction Materials]

CENG 458 Construction Engineering Design Project: 3 credits (1 Lecture, 2 credits Project work). This capstone course involves the development and completion of a comprehensive design project that integrates the knowledge and skills acquired throughout the construction engineering program. Students will work in teams to identify, analyze, and solve real-world engineering problems, applying principles of construction management, design, and technology. The project requires detailed planning, design, and the presentation of findings, including cost estimation, scheduling, and risk management strategies. Professional ethics, effective communication, and teamwork are emphasized throughout the project. The course culminates in a final presentation to students and faculty. [Prerequisites: Senior Standing, CENG 425: Construction Project Management, CENG 445: Construction Cost Estimating and Control]

CENG 499 Undergraduate Research Project: 1-6 credits (Research). This course is designed for junior or senior undergraduate students who have an interest in pursuing a special problem as an independent research project. An Independent Study Contract must be prepared and submitted for approval by the Department Chair within the first week of the semester. Students cannot take more than two CENG 499 courses for a combined total of 6 credits. This course requires the consent of the instructor and the approval of the Department Chairperson. [Prerequisites: Senior Standing, Permission of Instructor, Approval of Department Chair]

ENGE 260* Statics: 3 credits (3 Lecture hours, 0 Lab hours). Addition, subtraction, and multiplication of force and moment vectors; equilibrium of particles, planar, and 3-dimensional rigid bodies under the action of forces and moments; applications of equilibrium principles to simple trusses, frames, and machines; center of mass and centroids; moments of inertia; internal forces and moments; shear force and bending moment diagrams. [Prerequisite: MATH 112: Calculus I]

ENGE 320* Statistics and Probability for Engineers: 3 credits (3 Lecture hours, 0 Lab hours). Probability; random variables and processes; discrete and continuous distributions and densities; collection and presentation of sample data; frequency distributions and histograms; confidence intervals; hypothesis testing; basic problems of statistical inference;

linear regression and correlation; designing engineering experiments. [Prerequisite: MATH 211: Calculus II]

ENGE 362* Mechanics of Materials: 3 credits (3 Lecture hours, 0 Lab hours). Introduction to stress, strain, materials properties, and Hooke's law; distortion of engineering materials in relation to changes in stress or temperature; torsion of circular rods and tubes; bending and shear stresses in beams; deflection of beams; thin wall pressure vessels; combined loading; stress and strain transformation; buckling of columns; engineering applications. [Prerequisites: ENGE 260: Statics, MATH 211: Calculus II]

ENGE 370* Computational Methods in Engineering: 3 credits (3 Lecture hours, 0 Lab hours). Fundamentals of linear algebra and basic operations of vectors and matrices; error analysis; solution of a system of linear equations; iterative solution of nonlinear equations; numerical integration; numerical solution of differential equations; introduction to Matlab software; programming and applications relating to the computational functions in Matlab. [Prerequisites: MATH 211: Calculus II/CR: MATH 241: Differential Equations]

Note: [*] Existing Courses

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

Students in the Construction Engineering program will take a total of 39 credit hours of General Education courses at the undergraduate level. This includes courses in Arts and Humanities (6 credits), Social and Behavioral Sciences (6 credits), Biological and Physical Sciences (7 credits), Math (4 credits), English Composition (9 credits), and Institution-Specific Courses (7 credits). Additionally, 22 credit hours are required in supportive Math, Science, Business, and Computer courses to provide a well-rounded foundation for the major.

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

The proposed Bachelor of Science in Construction Engineering degree will be designed to meet the criteria for accreditation by the Accreditation Board for Engineering and Technology (ABET). According to the ABET official website, "ABET accreditation assures confidence that a collegiate program has met standards essential to prepare graduates to enter critical STEM fields in the global workforce. Graduates from an ABET-accredited program have a solid educational foundation and can lead the way in innovation, emerging technologies, and in anticipating the welfare and safety needs of the public" (Source: <https://www.abet.org/accreditation/what-is-accreditation/why-abet-accreditation-matters/>).

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

There will be no contracts with other institutions or non-collegiate organizations.

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.

The full curriculum and course-specific information for the proposed degree program will be made available on the Department of the Built Environment website: www.umes.edu/tech. Additional information regarding academic and student support services, financial aid resources, and tuition payment policies can be accessed through the websites of the UMES Office of Admissions and Recruitment and the Office of Student Financial Aid. Students are introduced to these resources during orientation and through communications at the start of

each semester. This ensures that students have clear and convenient access to essential information throughout their academic journey.

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 proposed Construction Engineering program will be advertised alongside other academic programs within the School of Business, Engineering, Applied Sciences, Technology, and Tourism Management at UMES. Advertising and recruiting efforts will be made through multiple platforms, including social media such as the UMES Facebook page, the University newsletter "*The Key*," the UMES Alumni Association, other professional societies, and Public Radio WESM 91.3. Advertising will also be done in collaboration with the Maryland Center for Construction Education. Additionally, printed brochures and flyers will also be developed and distributed.

H. Adequacy of Articulation (as outlined in COMAR 13B.02.03.19)

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

UMES currently maintains articulation agreements with several community colleges and high schools throughout the state to support undergraduate degree pathways. For example, the existing Construction Management Technology program in the Department of the Built Environment has articulation agreements in place with Wor-Wic Community College, Frederick Community College, Montgomery College, and Northern Virginia Community College.

Recently, UMES established a provisional articulation agreement with Wor-Wic Community College, Salisbury, MD for the STEM Transfer, Engineering Concentration (A.S.), providing a pathway to the proposed Bachelor of Science in Construction Engineering program.

The goal of the proposed program is to strengthen existing partnerships with community colleges and high schools while developing new articulation agreements. Furthermore, the department will collaborate with the Maryland State Department of Education to establish articulation agreements with K-12 schools, creating a comprehensive educational pipeline that supports students' progression from secondary education through degree completion in Construction Engineering.

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

1. Provide a brief narrative demonstrating the quality of the 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 the proposed program.

The following is 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 the proposed program.

Course Prefix & Number	Course Title	Course Credit	Instructor Name	Instructor Title	Instructor Degree Field	Instructor Academic Rank	Instructor Status
CENG 201	Engineering Graphics	3	Ismail Farajpour	Ph.D.	Civil/Structural Engineering	Associate Professor	Full-time/Tenured
CENG 214	Surveying and Geomatics	3	Joseph Arumala	Ph.D.	Civil Engineering	Professor	Full-time/Tenured
CENG 230	Construction Materials	3	Joseph Arumala	Ph.D.	Civil Engineering	Professor	Full-time/Tenured
CENG 310	Structural Analysis	3	Ismail Farajpour	Ph.D.	Civil/Structural Engineering	Associate Professor	Full-time/Tenured
CENG 325	Construction Methods and Equipment	3	Carlos Salgado	Ph.D.	Construction Engineering and Management	Associate Professor	Full-time/Tenured
CENG 350	Fluid Mechanics and Hydraulics	3	Jeffrey Molavi	Ph.D.	Civil/Construction Engineering and Management	Professor	Full-time/Tenured
CENG 363	Properties and Mechanics of Materials Lab	1	Sandeep Aryal	Ph.D.	Mechanical Engineering	Assistant Professor	Full-time/ Tenure-track
CENG 386	Construction Planning and Scheduling	3	Carlos Salgado	Ph.D.	Construction Engineering and Management	Associate Professor	Full-time/Tenured
CENG 395	Internship	1	Jeffrey Molavi	Ph.D.	Civil/Construction Engineering and Management	Professor	Full-time/Tenured
CENG 410	Structural Steel Design	3	Ismail Farajpour	Ph.D.	Civil/Structural Engineering	Associate Professor	Full-time/Tenured
CENG 412	Reinforced Concrete Design	3	Ismail Farajpour	Ph.D.	Civil/Structural Engineering	Associate Professor	Full-time/Tenured
CENG 420	Construction Engineering Systems	3	Joseph Arumala	Ph.D.	Civil Engineering	Professor	Full-time/Tenured
CENG 425	Construction Project Management	3	Carlos Salgado	Ph.D.	Construction Engineering and Management	Associate Professor	Full-time/Tenured
CENG 427	Soil Mechanics and Foundation Engineering	3	Joseph Arumala	Ph.D.	Civil Engineering	Professor	Full-time/Tenured
CENG 440	Construction Safety and Health Management	3	Carlos Salgado	Ph.D.	Construction Engineering and Management	Associate Professor	Full-time/Tenured

CENG 445	Construction Cost Estimating and Control	3	Carlos Salgado	Ph.D.	Construction Engineering and Management	Associate Professor	Full-time/Tenured
CENG 458	Construction Engineering Design Project	3	Jeffrey Molavi	Ph.D.	Civil/Construction Engineering and Management	Professor	Full-time/Tenured
ENGE 260	Statics	3	MD Sarker	Ph.D.	Biomedical Engineering	Assistant Professor	Full-time/ Tenure-track
ENGE 320	Statistics and Probability for Engineers	3	Russell Kohl	Ph.D.	Applied Mathematics and Mathematical Physics	Associate Professor	Full-time/Tenured
ENGE 362	Mechanics of Materials	3	Aaron Persad	Ph.D.	Mechanical and Industrial Engineering	Assistant Professor	Full-time/ Tenure-track
CENG 305	Engineering Economy	3	Jeffrey Molavi	Ph.D.	Civil/Construction Engineering and Management	Professor	Full-time/Tenured
CENG 320	Introduction to Environmental Engineering	3	Joseph Arumala	Ph.D.	Civil Engineering	Professor	Full-time/Tenured
CENG 326	Mechanical and Electrical Building Systems	3	Jeffrey Molavi	Ph.D.	Civil/Construction Engineering and Management	Professor	Full-time/Tenured
CENG 330	Introduction to Transportation Engineering	3	Joseph Arumala	Ph.D.	Civil Engineering	Professor	Full-time/Tenured
CENG 360	Introduction to Wind Energy and Turbine Technology	3	Jeffrey Molavi	Ph.D.	Civil/Construction Engineering and Management	Professor	Full-time/Tenured
CENG 416	Water and Wastewater Treatment	3	Jeffrey Molavi	Ph.D.	Civil/Construction Engineering and Management	Professor	Full-time/Tenured
CENG 430	Highway Engineering	3	Joseph Arumala	Ph.D.	Civil Engineering	Professor	Full-time/Tenured
CENG 450	Sustainable Design and Construction	3	Joseph Arumala	Ph.D.	Civil Engineering	Professor	Full-time/Tenured
CENG 499	Undergraduate Research Project	1-6	Ismail Farajpour; Jeffrey Molavi; Joseph Arumala; Carlos Salgado	Ph.D.	Civil/Structural Engineering; Civil/Construction Engineering and Management; Civil Engineering; Construction Engineering and Management	Associate Professor; Professor; Professor Associate Professor	Full-time/Tenured
ENGE 370	Computational Methods in Engineering	3	Ricky Stanfield	Ph.D.	Aerospace/Mechanical Engineering	Associate Professor	Adjunct Faculty

The Department of the Built Environment at the University of Maryland Eastern Shore (UMES) has a qualified and experienced faculty prepared to support the proposed Bachelor of Science in Construction Engineering program. Currently, four (4) full-time, tenured faculty members with terminal doctoral degrees in civil

or construction engineering fields are available to deliver the core and elective courses in the proposed program.

Department of the Built Environment Faculty

Faculty Name	Appointment Type	Terminal Degree (Title & Field)	Academic Title / Rank	Status / (FT/PT/Adjunct)	Courses Assigned in the Proposed Program
Joseph Arumala	Tenured	Ph.D. in Civil Engineering	Professor	full-time	CENG 214-Surveying and Geomatics CENG 230-Construction Materials CENG 420-Construction Engineering Systems CENG 427-Soil Mechanics and Foundation Engineering Core Elective
Ismail Farajpour	Tenured	Ph.D. in Civil/Structural Engineering	Associate Professor	full-time	CENG 201-Engineering Graphics CENG 310-Structural Analysis CENG 410-Structural Steel Design CENG 412-Reinforced Concrete Design Core Elective
Jeffrey Molavi	Tenured	Ph.D. in Civil/Construction Engineering and Management	Professor	full-time	CENG 350-Fluid Mechanics and Hydraulics CENG 395-Internship CENG 458-Construction Engineering Design Project Core Elective
Carlos Salgado	Tenured	Ph.D. in Construction Engineering and Management	Associate Professor	full-time	CENG 325-Construction Methods and Equipment CENG 386-Construction Planning and Scheduling CENG 425-Construction Project Management CENG 440-Construction Safety and Health Management CENG 445-Construction Cost Estimating and Control Core Elective

The Department of the Built Environment at the University of Maryland Eastern Shore (UMES) has qualified and experienced faculty to support the proposed BS in Construction Engineering program. In addition to construction engineering courses, the Department of Engineering at UMES offers foundational courses that support the curriculum. The Department of Mathematics offers one of the core courses. All core and elective courses with assigned faculty are listed in the table below.

Category	Course Prefix & Number	Course Name	Academic Level	Semester	Faculty Name	Associated Department of the Faculty
Core	CENG 201	Engineering Graphics	Sophomore	Fall	Ismail Farajpour	Built Environment
Core	CENG 214	Surveying and Geomatics	Sophomore	Spring	Joseph Arumala	Built Environment
Core	CENG 230	Construction Materials	Sophomore	Spring	Joseph Arumala	Built Environment
Core	CENG 310	Structural Analysis	Junior	Spring	Ismail Farajpour	Built Environment
Core	CENG 325	Construction Methods and Equipment	Junior	Fall	Carlos Salgado	Built Environment

Core	CENG 350	Fluid Mechanics and Hydraulics	Junior	Spring	Jeffrey Molavi	Built Environment
Core	CENG 363	Properties and Mechanics of Materials Lab	Junior	Fall	Sandeep Aryal	Engineering
Core	CENG 386	Construction Planning and Scheduling	Junior	Spring	Carlos Salgado	Built Environment
Core	CENG 395	Internship	Junior	Summer	Jeffrey Molavi	Built Environment
Core	CENG 410	Structural Steel Design	Senior	Fall	Ismail Farajpour	Built Environment
Core	CENG 412	Reinforced Concrete Design	Senior	Spring	Ismail Farajpour	Built Environment
Core	CENG 420	Construction Engineering Systems	Senior	Fall	Joseph Arumala	Built Environment
Core	CENG 425	Construction Project Management	Senior	Fall	Carlos Salgado	Built Environment
Core	CENG 427	Soil Mechanics and Foundation Engineering	Senior	Fall	Joseph Arumala	Built Environment
Core	CENG 440	Construction Safety and Health Management	Senior	Spring	Carlos Salgado	Built Environment
Core	CENG 445	Construction Cost Estimating and Control	Junior	Spring	Carlos Salgado	Built Environment
Core	CENG 458	Construction Engineering Design Project	Senior	Spring	Jeffrey Molavi	Built Environment
Core	ENGE 260	Statics	Sophomore	Fall	MD Sarker	Engineering
Core	ENGE 320	Statistics and Probability for Engineers	Junior	Fall	Russell Kohl	Mathematics
Core	ENGE 362	Mechanics of Materials	Junior	Fall	Aaron Persad	Engineering
Elective	CENG 305	Engineering Economy	Senior	Spring	Jeffrey Molavi	Built Environment
Elective	CENG 320	Introduction to Environmental Engineering	Senior	Spring	Joseph Arumala	Built Environment
Elective	CENG 326	Mechanical and Electrical Building Systems	Senior	Spring	Jeffrey Molavi	Built Environment
Elective	CENG 330	Introduction to Transportation Engineering	Senior	Spring	Joseph Arumala	Built Environment
Elective	CENG 360	Introduction to Wind Energy and Turbine Technology	Senior	Spring	Jeffrey Molavi	Built Environment
Elective	CENG 416	Water and Wastewater Treatment	Senior	Spring	Jeffrey Molavi	Built Environment
Elective	CENG 430	Highway Engineering	Senior	Spring	Joseph Arumala	Built Environment
Elective	CENG 450	Sustainable Design and Construction	Senior	Spring	Joseph Arumala	Built Environment
Elective	CENG 499	Undergraduate Research Project	Senior	Spring	Ismail Farajpour/Jeffrey Molavi/Joseph Arumala/Carlos Salgado	Built Environment
Elective	ENGE 370	Computational Methods in Engineering	Senior	Spring	Ricky Stanfield	Engineering

The table below lists the appointment type, terminal degree, academic title, and status of all faculty members who will offer the core courses of the Construction Engineering program, including those who are not part of the Department of Built Environment.

Faculty Name	Associated Department of the Faculty	Appointment Type	Terminal Degree	Academic Title	Status
Carlos Salgado	Built Environment	9- month	Ph.D. in Construction Engineering and Management	Associate Professor	Full-time/Tenured
Ismail Farajpour	Built Environment	12-month	Ph.D. in Civil/Structural Engineering	Associate Professor	Full-time/Tenured
Jeffrey Molavi	Built Environment	9- month	Ph.D. in Civil/Construction Engineering and Management	Professor	Full-time/Tenured
Joseph Arumala	Built Environment	9- month	Ph.D. in Civil Engineering	Professor	Full-time/Tenured
Aaron Persad	Engineering	9- month	Ph.D. in Mechanical and Industrial Engineering	Assistant Professor	Full-time, Tenure-track
MD Sarker	Engineering	9- month	Ph.D. in Biomedical Engineering	Assistant Professor	Full-time, Tenure-track
Ricky Stanfield	Engineering	Part Time	Ph.D. in Aerospace/Mechanical Engineering	Associate Professor	Adjunct Faculty
Sandeep Aryal	Engineering	9- month	Ph.D. In Mechanical Engineering	Assistant Professor	Full-time, Tenure-track
Russell Kohl	Mathematics	9- month	Ph.D. in Applied Mathematics and Mathematical Physics	Associate Professor	Full-time/Tenured

The UMES Department of Engineering currently offers and teaches foundational engineering courses that support the proposed curriculum, including:

- CENG 363-Properties and Mechanics of Materials Lab
- ENGE 260-Statics
- ENGE 320-Statistics and Probability for Engineers
- ENGE 362-Mechanics of Materials
- ENGE 370-Computational Methods in Engineering

The Department of Built Environment is also in the process of hiring one additional faculty member for Fall 2026, which will further strengthen instructional capacity and support program growth.

2. Demonstrate how the institution will provide ongoing pedagogy training for faculty in evidence-based best practices, including training in:

a) Pedagogy that meets the needs of the students

The University of Maryland Eastern Shore (UMES) supports faculty development through ongoing professional development, ensuring the use of evidence-based teaching practices that enhance student success. Faculty participate in workshops, seminars, and learning communities led by the Center for Teaching Excellence (CTE), emphasizing active learning, inclusive pedagogy, assessment strategies, and continuous course improvement.

The Department of the Built Environment further supports faculty development through participation in conferences and workshops, including ABET and ACCE, to strengthen pedagogical practices in civil and construction engineering education.

b) The learning management system

UMES provides faculty with ongoing training in the Canvas LMS through webinars and workshops led by the Center for Instructional Technology and Online Learning (CITOL). Training covers course design, content delivery, assessment tools, accessibility features, and feedback mechanisms. Faculty also have access to continuous technical assistance, ensuring effective integration of the LMS to enhance student learning.

c) Evidence-based best practices for distance education, if distance education is offered.

Some courses in the program may be offered in online or hybrid formats. Faculty receive training through the Center for Instructional Technology and Online Learning (CITOL) on course alignment, online engagement, accessibility, and assessment. Courses are regularly reviewed, and faculty receive feedback to ensure and improve the quality of distance education.

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.

The Frederick Douglass Library located at the University of Maryland Eastern Shore provides a multiplicity of print and digital resources to support the mission and academic programs of the university. According to the Library's website, "As a member of the University System of Maryland and Affiliated Institutions (USMAI) consortium, the library is affiliated with seventeen academic libraries to share library resources. The integrated library system, ALEPH, makes it possible for our patrons to have 24/7 access to the library catalog, USMAI collections, and electronic resources. These digital resources available from the library's website include over 100 research databases that provide access to eBooks and full-text

coverage of thousands of scholarly journals, magazines, and newspapers.”(Source: https://umes.libguides.com/library_admin/overview)

Before the start of each semester, the Frederick Douglass Library reaches out to faculty to identify the resources that will be used in their upcoming courses. The library ensures that these materials, including textbooks, are available to students by the first day of classes. This proactive approach helps support student learning and ensures that all course-related resources are readily accessible from the beginning of the semester.

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.**

The University of Maryland Eastern Shore’s Department of the Built Environment is housed in the Thomas & Briggs Arts and Technologies Complex (ATC), a 37,878-square-foot facility that serves both the Department of Fine Arts and the Department of the Built Environment. Within the Built Environment suite, there are nine designated offices for faculty and staff to facilitate student advising, office hours, and administrative duties. There are also two offices for files, a copier, and storage as well as a conference room. The ATC houses instructional classroom space and instructional laboratory space (as detailed below), which makes it convenient for students to take classes and conduct laboratory experiments in the same building.

Instructional Classroom Space — At the ATC building, there are multiple instructional and resource spaces to support student learning:

- *Project Planning Room* (ATC building): A small computer laboratory used as a classroom.
- *Larger classroom* (ATC building): Equipped with a projector for lectures and instructional purposes.
- *Computer-Aided Drafting and Design Lab* (ATC building): Equipped with 13 recently upgraded computers and a new 98-inch display, along with the necessary software packages to support the new program.
- *Student Resource Center* (ATC building): Includes nine newly upgraded computers, a 98-inch display, conference tables, previous edition textbooks, industry publications, and a large plotter/printer. Designed as an open resource lab for students in the Department of the Built Environment, it has limited scheduled classes, and students can use this space for software access, research, and small group study.

In addition to the labs in the ATC building, students have access to the computer labs in the Engineering and Aviation Science Complex (EASC) building.

All computer labs receive ongoing technical support from the UMES Department of Information Technology (IT).

Instructional Laboratory Space— The Department of the Built Environment is housed in the Arts and Technology building, which houses multiple laboratory spaces and equipment.

- The Construction Laboratory is an area where students apply skills and knowledge related to construction technology. This lab contains various woodworking equipment and hand tools. It is divided by portable dividers that separate the learning and activity areas. The learning area is equipped with whiteboards, desks, chairs, and furniture, while the activity area houses equipment such as lathes, drill presses, planers, jointers, miter saws, table saws, scroll saws, and large worktables for student projects.
- The Soil Mechanics Laboratory (Located in one portion of the Construction Laboratory) is equipped for experiments in soil behavior and geotechnical testing. Key apparatus includes Proctor compaction test equipment, California Bearing Ratio (CBR) test setup, direct shear, Atterberg limits apparatus, a lab oven, and a sieve set for grain size analysis. The lab provides practical experience in evaluating soil properties and understanding their engineering applications.
- Surveying Equipment Storage: The Surveying equipment is maintained in a designated storage space and used primarily for field measurement and surveying exercises. Key instruments include measuring tapes and chains, tripods and ranging rods, prismatic compasses, auto levels, theodolites, and total stations. The lab supports practical learning in surveying techniques and accurate measurement.
- Resource Laboratory: which contains a 3D printer and various pieces of construction equipment, all available for student projects.

In addition to these departmental labs, a couple of laboratories in the Engineering and Aviation Science Complex (EASC) building on the UMES main campus, within walking distance of the ATC, will also be utilized to further support experimental learning.

- The Statics and Materials Laboratory: Located in the EASC Building, this laboratory accommodates up to 20 students. It provides experience with material strength and behavior through experiments such as hardness

testing, shear and torsion testing, compression and tension testing, strain measurement, beam deflection analysis, beam and cylinder testing, impact testing, and fatigue testing. These activities give students practical skills in evaluating and testing a wide range of materials.

- The Thermal/Fluid Laboratory: includes equipment for hydraulics, fluid mechanics, and heat transfer. Students gain experience through experiments such as flow channels, hydraulic benches, airflow analysis, Bernoulli's principle, friction losses in pipes, flow measurement, stability of floating bodies, center of pressure, impact of jets, Reynolds number studies, air conditioning systems, steam turbines, convection and radiation heat transfer, and temperature measurement and calibration. This laboratory supports studies in water resources, environmental engineering, and building systems.

The classroom and laboratory spaces are equipped to support most of the activities in the new courses and research activities.

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.

a) All enrolled students and hired faculty at the University of Maryland Eastern Shore are assigned official university email accounts. They also have access to video conferencing via Microsoft Teams.

b) All enrolled students and hired faculty have access to Canvas, the official Learning Management System at UMES. The Center for Instructional Technology and Online Learning (CITOL) provides faculty support for the development and instruction of courses. The Department of Information Technology (IT) provides Helpdesk services, computer support, and maintenance for the campus data network, telephone systems, classroom technology, computer labs, technology procurement, data center, email, and network storage. Also providing support is the Academic Computing Unit.

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

The financial sustainability and break-even point for the proposed program have been carefully evaluated by the department as part of the program development process. This analysis considered current resource utilization, enrollment trends, and projected revenue growth to ensure that the program is fiscally sound from inception and sustainable over time.

The department currently operates within a financially stable model in which the revenue generated from tuition and fees across its portfolio of academic programs exceeds the annual costs associated with faculty salaries, fringe benefits, and support staff. This existing surplus demonstrates that the department is operating above its break-even point and has the capacity to support additional programmatic offerings.

The proposed program is expected to further strengthen this financial position by increasing student enrollment and associated tuition revenue without requiring additional faculty hires or expansion of support staff. The program will leverage existing instructional capacity, infrastructure, and administrative resources, allowing for efficient scaling and cost containment.

Enrollment projections for the program reflect steady, controlled growth and have been developed to ensure that the program remains financially viable throughout its implementation. As enrollment increases, the additional tuition and fee revenue will contribute positively to the department's overall revenue stream, further reinforcing its financial sustainability.

In addition, the department intends to pursue accreditation through the Accreditation Board for Engineering and Technology (ABET). This process requires ongoing assessment and monitoring of program quality, resources, and financial stability, providing an added layer of accountability and assurance regarding the program's long-term sustainability.

Based on these considerations, the proposed resources are sufficient to cover all anticipated program expenses. The program is therefore financially viable, operates above the break-even point at launch, and is positioned to generate additional revenue while maintaining high academic quality and operational efficiency.

- 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					
Resources Categories	(Year 1)	(Year 2)	(Year 3)	(Year 4)	(Year 5)
1. Reallocated Funds	\$0	\$0	\$0	\$0	\$0
2. Tuition / Fee Revenue (C + G below)	\$71,415	\$117,027	\$164,436	\$213,694	\$264,857
A. # of FT Students	7	11	15	19	23
B. Annual Tuition / Fee Rate	\$9,366	\$9,553	\$9,744	\$9,939	\$10,138
C. Annual / Full-Time Revenue (A x B)	\$65,559	\$105,081	\$146,158	\$188,836	\$233,163
D. # of PT Students	2	4	6	8	10
E. Credit Hour Rate	\$244	\$249	\$254	\$259	\$264
F. Annual Credit Hours	12	12	12	12	12
G. Total Part Time Revenue (D x E x F)	\$5,856	\$11,946	\$18,278	\$24,858	\$31,694
3. Grants, Contracts & Other External Sources	\$0	\$0	\$0	\$0	\$0
4. Other Sources	\$0	\$0	\$0	\$0	\$0
TOTAL (Add 1 - 4)	\$71,415	\$117,027	\$164,436	\$213,694	\$264,857

Narrative Rationale for Table 1: Resources

1. Reallocated Funds

No reallocated funds are expected for the launch or continuation of the Construction Engineering program. The program will be supported through new revenue sources and existing departmental infrastructure.

2. Tuition and Fee Revenue

The annual in-state tuition rate is \$9,365.50 for full-time students. For part-time students, the credit hour rate is \$244.00 per credit hour, with calculations for 6 credits per semester or 12 credits per academic year. The above fees are based on a 2% tuition rate increase per year.

3. Grants and Contracts

Currently, no additional external sources of funding, such as grants or contracts, are expected to support the proposed program. However, the department may pursue such opportunities in the future.

4. Other Sources

No additional sources of funding are expected at this time.

5. Total Year: A 5-year estimate is provided.

The total projected revenue over the five years is based solely on tuition and fee income, as detailed above. This revenue will be allocated to instructional costs, equipment, and program development.

- 2. Complete Table 2. Program Expenditures 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 expenditure category.**

TABLE 2: EXPENDITURES					
Expenditures Categories	(Year 1)	(Year 2)	(Year 3)	(Year 4)	(Year 5)
1. Total Faculty Expenses (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
2. Total Administrative Staff Expenses (B + C below)	\$0	\$0	\$0	\$0	\$0
A. # FTE	0	0	0	0	0
B. Total Salary	\$0	\$0	\$0	\$0	\$0
C. Total Benefits	\$0	\$0	\$0	\$0	\$0
3. Total Support Staff Expenses (B + C Below)	\$0	\$0	\$0	\$0	\$0
A. # FTE	0	0	0	0	0
C. Total Salary	\$0	\$0	\$0	\$0	\$0
c. Total Benefits	\$0	\$0	\$0	\$0	\$0
4. Equipment	\$30,000	\$30,600	\$31,212	\$31,836	\$32,473
5. Library	\$1,000	\$1,020	\$1,040	\$1,061	\$1,082
6. New or Renovated Space	\$5,000	\$5,100	\$5,202	\$5,306	\$5,412
7. Other Expenses	\$10,000	\$10,200	\$10,404	\$10,612	\$10,824
TOTAL (Add 1 – 7)	\$46,000	\$46,920	\$47,858	\$48,816	\$49,792

Narrative Rationale for Table 2: Expenditures

1. Faculty (# FTE, Salary and Benefits)

No additional faculty is required to launch the program. The existing department faculty will be sufficient to support the program.

2. Support Staff (# FTE, Salary and Benefits)

No additional support staff is required. The existing department administrative staff will be sufficient to support the program.

3. Equipment

The school has the initial equipment and facilities to launch the proposed program, including instructional spaces and laboratories in the ATC and EASC buildings, equipped with upgraded computers, large displays, surveying instruments, construction equipment, and essential apparatus for the Soil Mechanics Laboratory. Additional support is provided by the Statics and Materials Laboratory and the Thermal/Fluid Laboratory in the EASC building, which offers laboratory experience in material testing, hydraulics, fluid mechanics, and heat transfer. Ongoing maintenance, upgrades, and consumables have been budgeted to ensure continued functionality and support future program development. These costs are included in the annual expenditure and are projected to increase by 2 percent annually.

4. Library

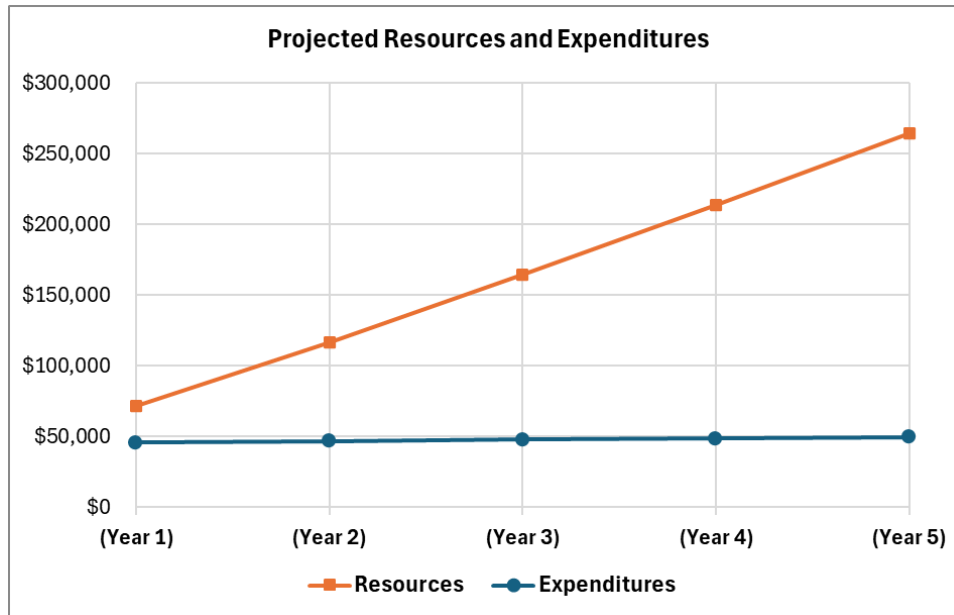
Given the existing robust collection of resources available for the construction-related disciplines, only minimal funds are required to acquire Construction Engineering textbooks and academic resources specific to the new curriculum. These costs are included in the annual expenditure and are projected with a 2 percent annual increase.

5. New and/or Renovated Space

Only minor space renovations are anticipated. This includes modest updates such as painting and reconfiguring existing classroom and laboratory areas within the Thomas & Briggs Arts and Technologies Complex and the EASC building to accommodate the new program. These costs are included in the annual expenditure with a 2 percent annual increase.

6. Other Expenses

Funding for professional development opportunities, such as ABET accreditation training, is to be allocated. Additionally, vendor training for the proper use and integration of equipment upgrades will be provided as needed. These costs are included in the annual expenditure with a 2 percent annual increase.



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 University of Maryland Eastern Shore has a comprehensive course and program evaluation process. Each course syllabus has a listing of course learning outcomes in relation to student learning outcomes. The course learning outcomes are assessed through embedded questions on tests, assignments, and portfolios that address specific course outcomes. Data is collected and analyzed, and results are used to improve course curriculum and pedagogy.

Teaching evaluations ask students to reflect on the course structure, the course content, and the instructor's performance. The summary data will be reviewed by faculty members, the department chair, and the school administration to determine whether revision or improvement actions are necessary.

Faculty members are evaluated each year. The evaluation process includes an assessment of faculty teaching, faculty research records, and productivity, as well as school-wide and department service. To receive a high evaluation, a faculty member must demonstrate effective teaching, active scholarly activities and publications, etc. There is also a provision for the administration to set up an improvement plan for faculty members who have not done well in teaching. The tenured faculty undergo a five-year post-tenure review. Students conduct faculty

evaluations at the end of each semester, and the ratings and comments are also a factor in the final performance rating of each faculty member.

Achievement of the program outcomes will be assessed using direct and indirect assessment procedures like those used for program improvement, as required by the accreditation organizations of our other accredited degree programs.

2. 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.

Once the B.S. in Construction Engineering program is launched, its courses will enter the course evaluation system. Program outcomes will be assessed through direct and indirect evaluation procedures like those used for other accredited degree programs.

Periodic academic program reviews take place every five years. Data regarding program enrollment, retention, and graduation rates are collected by the Office of Decision Science and Visualization in conjunction with the Department Chair. Data is then analyzed against program outcomes, and the results are used to improve the program. As per ABET criteria, a program accreditation comprehensive review takes place every six years. Assessment, evaluation, and continuous improvement are an integral part of faculty teaching and performance evaluation.

Assessment instruments such as graded student work, including assignments, quizzes, and exams, evaluation of written project papers, and presentations are all used in student learning outcome evaluations. The achievement levels are determined using rubrics developed for each outcome.

Student satisfaction is of the utmost importance and is measured using course evaluation and exit interview surveys. It is also an important factor in student retention. This will be attained through maintaining a high-quality program, regularly updating the curriculum to ensure relevance to current and future trends, hiring and maintaining highly qualified faculty, and keeping a positive learning environment for students.

Faculty satisfaction and program cost-effectiveness will be evaluated through performance reviews, faculty feedback, and an analysis of operational expenses versus program enrollment and job placement outcomes. Through these multi-faceted evaluation strategies, the university will ensure that the Construction Engineering program delivers high-quality, outcomes-driven education that meets the needs of students, employers, and the broader community.

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 mission of the University of Maryland Eastern Shore is compatible with the State of Maryland's minority achievement goals. UMES is an 1890 land grant HBCU. Our programs attract a diverse set of students, with the majority of the student population being African American and those from multiethnic and multicultural backgrounds. The University actively recruits minority populations for all undergraduate and graduate-level degrees. Special attention is provided to recruit diverse groups into the STEM and multidisciplinary programs at all degree levels: undergraduate, master's, and doctoral. The same commitment will be extended to the B.S. in Construction Engineering program.

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 B.S. in Construction Engineering program has no relationship with low-productivity programs.

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 proposed B.S. in Construction Engineering program is not a distance education program. Some general or supportive courses may have online delivery options; however, the core courses will be delivered primarily in-person.

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

Not applicable.

- New Agreement** **Revised Agreement** **Provisional Agreement**
 Effective Date: **Next Review Date:**

**ACADEMIC PROGRAM ARTICULATION AGREEMENT BETWEEN
 WOR-WIC COMMUNITY COLLEGE
 AND
 UNIVERSITY OF MARYLAND EASTERN SHORE
 REGARDING THE TRANSFER FROM
 ASSOCIATE OF SCIENCE IN STEM, ENGINEERING CONCENTRATION
 TO
 BACHELOR OF SCIENCE IN CONSTRUCTION ENGINEERING**

This Academic Program Articulation Agreement (“Agreement”) is entered into by and between Wor-Wic Community College (the “Sending Institution”) and the University of Maryland Eastern Shore (the “Receiving Institution”) (collectively, the “Institutions”) to facilitate the transfer of academic credits from the STEM, Engineering Concentration, Associate degree, for the completion Construction Engineering, Bachelor’s degree (the “Program(s)”):

Institution	Program ID/Title	Award Type	Statewide CIP
Wor-Wic Community College	490200 – STEM, Engineering Concentration	Associate’s Degree	419999
University of Maryland Eastern Shore	0908 - Construction Engineering	Bachelor’s Degree	143301

A. Qualifying Students

This Agreement pertains to the transfer of “Qualifying Students”, *i.e.*, those students who:

1. Have completed the STEM, Engineering Concentration at Wor-Wic Community College in good standing and with a minimum CGPA of 2.0/4.0;
2. Are accepted for admission to the University of Maryland Eastern Shore; and
3. Are enrolled in Construction Engineering.

B. Responsibilities of the Institutions

The Institutions agree to implement the transfer of Qualifying Students in accordance with applicable law and the following requirements and protocols:

1. A Qualifying Student may transfer from Wor-Wic Community College to the University of Maryland Eastern Shore for the completion of the Bachelor of Science in Construction Engineering.
2. Courses that the University of Maryland Eastern Shore will accept credits for towards completion of the Bachelor of Science in Construction Engineering:

PROGRAM ARTICULATION TABLE

	Wor-Wic Community College	University of Maryland Eastern Shore
Program name	STEM Transfer (<i>Engineering Concentration</i>)	Construction Engineering
Award Type (e.g., AAS)	AS	BS
Credit Length	60	120

SECTION A - General Education

Wor-Wic Community College			University of Maryland Eastern Shore			
Course Prefix & Number	Course Name	Credits	Course Prefix & Number	Course Name	Credits Applied	Elective Credits
SDV 100	Fundamentals of College Study	1	ENGE 100	First Year Orientation with Engineering	1	
ENG 101	Fundamentals of English I	3	ENGL 101	Principles of Composition I	3	
MTH 201	Calculus I	4	MATH 112	Calculus I	4	
PHY 141	Principles of Physics I	4	PHYS 161/163	General College Physics I w/lab	4	
ENG 151	Fundamentals of English II	3	ENGL 102	Principles of Composition II	3	
ECO 151*	Principles of Macroeconomics (<i>Social/Behavioral Science Elective</i>)	3	ECON 201	Principles of Economics (Macro)	3	
COM 101 <i>or</i> COM 200*	Introduction to Public Speaking <i>or</i> Interpersonal Communication (<i>General Education Elective</i>)	3	ENGL 203	Fundamentals of Interpersonal Communication	3	
OFT-101*	Intro to Computers (<i>General Education Elective</i>)	3	BUED 212	Computer Concepts/Applications I	3	
ART 101**	Introduction to Art History (<i>Arts and Humanities</i>)	3	ARTS 101	Exploration of the Visual Arts	3	
PSY 101**	Introduction to Psychology (<i>Social/Behavioral Science</i>)	3	PSYC 100	Introduction to Psychology	3	
General Education Total		30	Section A Subtotal		30	

Special Notes, if any:

- * **UMES recommends students complete ECO 151 and COM 101 or COM 200 and OFT-101**
- ** **Courses listed are options; multiple courses may apply in the Arts and Humanities and Social/Behavioral Science areas and may be accepted upon review.**

SECTION B – Program Core / Supportive Requirement

Course Prefix & Number	Course Name	Credits	Course Prefix & Number	Course Name	Credits Applied	Elective Courses
EGR 101	Introduction to Engineering Design	3	CENG 201	Engineering Graphics	3	
MTH 202	Calculus II	4	MATH 211	Calculus II	4	
PHY 142	Principles of Physics II	4	PHYS 262/264	General Physics II: Waves, Heat & Electricity w/Lab	4	
CHM 105	General Chemistry	4	CHEM 111/113	General Chemistry I w/Lab	4	
EGR 202	Statics	3	ENGE 260	Statics	3	
MTH 205	Differential Equations	4	MATH 241	Elements of Differential Equations for Engineers	3	1
MTH 203	Calculus III	4	MATH 212	Calculus III	4	
PHY 243	Principles of Physics III	4	PHYS 263/265	General Physics III: Magnetism, Electrodynamics, and Optics	0	4
Program / Major Requirement Total		30	Section A Subtotal		25	5
Total College Credits Applied (sum of sections A and B)					55	

Special Notes, if any:

SECTION C - Remaining University of Maryland Eastern Shore Requirements		
UMES (General Education)		
ENVS 101	Introduction to Environmental Science	3
BUAD 311	Justice and Diversity in Organizations	3
ENGL 305, or ENGL 310	Technical Writing, or Advanced Composition	3
Remaining General Education Courses Subtotal		9
Supportive Math-Science-Business-Computer Courses		
CSDP 120	Introduction to Computer Programming	3
Remaining Supportive Courses Subtotal		3
Core Courses		
CENG 214	Surveying and Geomatics	3
CENG 230	Construction Materials	3
CENG 310	Structural Analysis	3
CENG 325	Construction Methods and Equipment	3
CENG 350	Fluid Mechanics and Hydraulics	3
CENG 363	Properties and Mechanics of Materials Lab	1
CENG 386	Construction Planning and Scheduling	3
CENG 395	Internship	1
CENG 410	Structural Steel Design	3
CENG 412	Reinforced Concrete Design	3
CENG 420	Construction Engineering Systems	3
CENG 425	Construction Project Management	3
CENG 427	Soil Mechanics and Foundation Engineering	3
CENG 440	Construction Safety and Health Management	3
CENG 445	Construction Cost Estimating and Control	3
CENG 458	Construction Engineering Design Project	3
Core Elective	Please see the academic advisor	3
ENGE 320	Statistics for Probability for Engineers	3
ENGE 362	Mechanics of Materials	3
Remaining Core Courses Subtotal		53
Core Elective Courses		
Remaining General Education Courses Subtotal		9
Remaining Supportive Courses Subtotal		3
Remaining Program Core Subtotal		53
Total Remaining UMES Credits		65
Total Credits for bachelor's degree (Wor-Wic and UMES)		120
Special Notes, if any:		

*Receiving Institution must indicate if the course is applied to General Education, Program/ Major requirements, or General Elective.

- The Receiving Institution shall designate, and shall provide to the Sending Institution, the contact information for a staff person at the Receiving Institution who is responsible for the oversight of the transfer of Qualifying Students. The Sending Institution shall designate, and shall provide to the Receiving Institution, the contact information for a staff person at the Sending Institution who is responsible for the oversight of the transfer of Qualifying Students.

	Wor-Wic Community College	University of Maryland Eastern Shore
Name of staff person responsible for oversight	Ms. Rhoda Lukens	Dr. Etahe Johnson
Title of staff person	Registrar	Academic Support Associate / Articulation Liaison
Email address	rlukens@worwic.edu	ejohnson2@umes.edu
Telephone Number	410-334-2800	410-651-6038

Should the staff person or position change, the institution will promptly provide new contact information to the partner institution and inform the Maryland Higher Education Commission of the change.

Additional contact information:

Direct Points of Contact for Articulation Agreement	Wor-Wic Community College	University of Maryland Eastern Shore
Other staff person responsible for oversight	Dr. Stacey Hall	Dr. Willie L. Brown, Jr.
Title of staff person	Dean of STEM	Vice Provost for Faculty Affairs
Email address	shall@worwic.edu	wlbrown@umes.edu
Telephone Number	410-334-6785	410-651-6038

4. If the Qualifying Student is using federal Title 38 VA Education Benefits (GI Bill® Education Benefits), the Institutions shall adhere to all applicable U.S. Department of Veterans Affairs' regulations, including the regulations governing the awarding prior credit, as regulated under Title 38, Code of Federal Regulations, Sections 21.4253(d)(3) and 21.4254(c)(4).
5. The transfer of Qualifying Students shall adhere to all applicable transfer requirements set forth in the Annotated Code of Maryland and the Code of Maryland Regulations.
6. Each Institution shall advise students regarding transfer opportunities under this Agreement, and shall advise students of financial aid opportunities and implications associated with the transfer.
7. Should either Institution makes changes to program requirements, the institution will inform the partner institution immediately. The articulation agreement should be updated to reflect the changes and forwarded to the Maryland Higher Education Commission.

C. Term and Termination

1. This Agreement shall become effective on the date it is signed by the appropriate and authorized representatives of each Institution.

2. The initial term of this Agreement shall be five (5) years from the effective date. Thereafter, the Agreement shall automatically renew for successive five (5)-year terms unless either Institution provides written notice of termination at least thirty (30) days prior to the expiration of the then-current term.
3. Either Institution may, at its sole discretion, terminate this Agreement by delivering thirty (30) days' written notice to the other Institution and the Maryland Higher Education Commission. If this Agreement is terminated prior to the end of the initial five (5)-year term, it shall automatically renew unless both Institutions mutually agree in writing to forego the renewal.
4. Both Institutions agree to meet once every two (2) years to review the terms of this Agreement and assess its effectiveness.

D. Amendment

1. This Agreement constitutes the entire understanding and agreement between the Institutions regarding their rights and obligations under the terms of the Agreement, superseding any prior or contemporaneous agreements or understandings.
2. This Agreement may be modified only by a written amendment executed by both Institutions.

E. Governing Law

This Agreement shall be governed by, and construed in accordance with, the laws of the State of Maryland.

F. Counterparts

This Agreement may be executed in counterparts, each of which shall be deemed to be an original, but all of which, taken together, shall constitute one and the same agreement.

G. Notice of Agreement

1. The Institutions agree to provide a copy of this Agreement, with any amendments, to the Maryland Higher Education Commission.
2. The Institutions agree to provide copies of this Agreement to all relevant individuals and departments of the Institutions, including but not limited to students, academic department chairs participating in the transfer, offices of the president, registrar's offices, and financial aid offices.

H. No Third-Party Beneficiaries

There are no third-party beneficiaries to this Agreement.

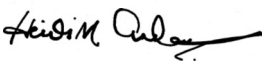
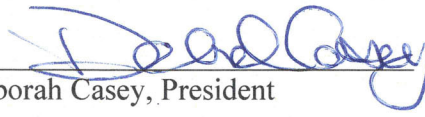
I. Representations and Warranties of the Parties

Both Institutions represent and warrant that the following shall be true and correct as of the Effective Date of this Agreement, and shall continue to be true and correct during the term of this Agreement:

1. The Institutions are and shall remain in compliance with all applicable federal, state, and local statutes, laws, ordinances, and regulations relating to this Agreement, as amended from time to time.
2. Each Institution has taken all action necessary for the approval and execution of this Agreement.

IN WITNESS WHEREOF, the parties hereto have caused this Agreement to be executed by their duly authorized representatives.

Signatures:

<p>University of Maryland Eastern Shore</p> <p>By:  _____ Dr. Heidi M. Anderson, President</p> <p><u>05 / 12 / 2026</u> _____ Date</p>	<p>Wor-Wic Community College</p> <p>By:  _____ Dr. Deborah Casey, President</p> <p><u>5/11/2026</u> _____ Date</p>
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Letter of Support

PRESIDENT
Joshua J. Taylor, P.E.
Somerset County Sanitary District
11916 Somerset Avenue #216
Princess Anne, MD 21853
Phone: 410.651.3831
Email: jtaylor@ascemd.org



TREASURER
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1171 E Market Place, Suite 200
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VICE PRESIDENT
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Stable Ground In-Situ
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267.896.5380
Email: rward@ascemd.org

May 19, 2026

Dr. Derrek B. Dunn
Professor of Computer Science and Engineering
Dean, School of Business and Technology
University of Maryland Eastern Shore
306656 Student Service Center
EASC Complex, Suite 30876
Princess Anne, MD 21853

Dear Dr. Dunn:

As in previous years, on behalf of the Eastern Shore Branch of the American Society of Civil Engineers, I offer this letter of support for any new or larger Civil Engineering/Construction Engineering and Management Program.

The Eastern Shore Branch of the Maryland Section of the American Society of Civil Engineers is formed of members from the Eastern Shore counties of Caroline, Dorchester, Kent, Queen Anne, Somerset, Talbot Worcester and Wicomico. The members of the Branch are employed by public and private firms and represent a cross section of the Civil Engineering specialty work being done here. The Branch and its members are engaged in activities that promote their professional development and the development of the Civil Engineering Profession. Over the years we have been actively engaged in assisting with STEM programs in local schools and with Career Fairs at schools.

One of the challenges we have faced on the Eastern Shore is that there has been no accredited Civil Engineering degree program offered by either of the two universities in this area. Therefore, we are always elated when we learned of possible Bachelors or Masters programs in Civil Engineering/Construction Engineering.

Nationally, there is an overall need of civil engineers. Of particular concern to us has been the challenge local engineering firms have faced to attract and retain civil engineering employees. This degree program will go a long way in solving this problem, because locally raised and locally trained civil engineers will be more willing to stay and work on the Eastern Shore. The degree program will keep the cost of college education down for local students and also provide educational resources for practicing engineers.

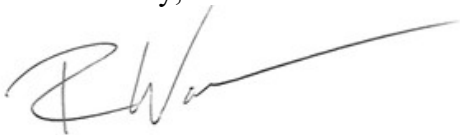
To gauge interest in the development of a local Civil Engineering/Construction Engineering degree program, in 2020 the Branch surveyed Eastern Shore employers to see what their degree

of interest is in hiring graduates from a local university. We contacted 43 public and private civil engineering employers. These were public agencies and private design and construction firms. About half responded. At that time there were openings for 25 to 50 civil engineers. There was an interest in hiring student interns. All the firms stressed their difficulty in hiring Civil Engineers. This indicates to us, that there will be a good job market for your graduates.

The ASCE Branch members are prepared to work with students enrolled in your program by encouraging professional development, assisting them in the formation of a UMES Student Chapter of ASCE, providing scholarship money, and providing opportunities for internships and later permanent employment. Our members will be available as mentors and guest speakers to provide practical insight into actual construction projects. Our members will offer your faculty opportunity to be involved with the local engineering community. As and where necessary, our members will be available as adjunct faculty.

We are very excited about the possible creation of a Civil Engineering/Construction Engineering Program and we look forward to working with you for its successful development.

Yours truly,

A handwritten signature in black ink, appearing to read 'R. Ward', with a long horizontal flourish extending to the right.

Ryan C. Ward, P.E.
Secretary – ASCEMD Eastern Shore Branch