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

Institution Submitting Proposal	Capitol Technology University

Each action below requires a separate proposal and cover sheet.

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

Payment Submitted: (●) Yes ( ) No
Payment Type: ( ) R*STARS # 99846 (●) Check # 99846
Payment Amount: 850.00
Date Submitted: 3/2/2026

Department Proposing Program	Engineering
Degree Level and Degree Type	Bachelor of Science (B.S.)
Title of Proposed Program	Bachelor of Science in Marine Infrastructure Engineering Technology
Total Number of Credits	120
Suggested Codes	HEGIS: 924.00 CIP: 15.1101
Program Modality	( ) On-campus ( ) Distance Education (fully online) (●) Both
Program Resources	(●) Using Existing Resources ( ) Requiring New Resources
Projected Implementation Date (must be 60 days from proposal submisison as per COMAR 13B.02.03.03)	(●) Fall ( ) Spring ( ) Summer Year: 2026
Provide Link to Most Recent Academic Catalog	URL: http://catalog.captechu.edu
Preferred Contact for this Proposal	Name: Dr. Mohamed Ghazy Title: Dean of Academics Phone: (340) 965-2473 Email: mshehata@captechu.edu
President/Chief Executive	Type Name: Dr. Bradford Sims Signature: [signature] Date: 3-2-26 Date of Approval/Endorsement by Governing Board: MARCH 2, 2026

Revised 1/2021

CAPITOL
Technology University

March 2, 2026

Dr. Sanjay Rai
Secretary of Maryland Higher Education
Maryland Higher Education Commission
217 E. Redwood Street, Suite 2100
Baltimore, MD 21202

Dear Dr. Rai,

Capitol Technology University respectfully requests approval to offer a Bachelor of Science (B.S.) in Marine Infrastructure Engineering Technology. The program will be delivered by qualified faculty and supported by specialized coursework designed to address workforce needs in marine and coastal infrastructure systems, structural inspection, corrosion control, construction technologies, and infrastructure resilience.

The proposed degree aligns with the University's mission to provide practical, hands-on education in engineering and applied sciences. The curriculum integrates structural systems, materials science, construction methods, environmental systems, and inspection technologies to prepare graduates for immediate contribution to Maryland's transportation, coastal, construction, and infrastructure sectors.

Growing public and private investment in infrastructure modernization, bridge rehabilitation, port development, and coastal resilience has increased demand for applied engineering technology professionals. This program is designed to meet those workforce needs while complementing existing academic offerings within the State.

We respectfully submit the enclosed proposal for your review and approval, along with all required supporting documentation, including confirmation of the adequacy of library resources.

Respectfully,

Bradford L. Sims, PhD

President

CAPITOL
Technology University

March 2, 2026

Dr. Sanjay Rai
Secretary of Maryland Higher Education
Maryland Higher Education Commission
217 E. Redwood Street, Suite 2100
Baltimore, MD 21202

Dear Dr. Rai,

This letter is in response to the need for confirmation of the adequacy of the library of Capitol Technology University to support the proposed Bachelor of Science in Marine Infrastructure Engineering Technology.

As President of the University, I confirm that the library resources, including support staff, are more than adequate to support the B.S. in Marine Infrastructure Engineering Technology. The Puente Library provides access to comprehensive print and digital resources in engineering technology, structural systems, construction management, materials science, environmental systems, and infrastructure-related disciplines necessary for the successful delivery of this program.

Additionally, the University remains dedicated and committed to the continuous improvement of its library resources by allocating sufficient budget and institutional support to ensure the academic success and professional preparation of our students.

Respectfully,

Bradford L. Sims, PhD
President

PROPOSAL FOR:

X NEW INSTRUCTIONAL PROGRAM
____ SUBSTANTIAL EXPANSION/MAJOR MODIFICATION
COOPERATIVE DEGREE PROGRAM
X WITHIN EXISTING RESOURCES or ____ REQUIRING NEW RESOURCES

CAPITOL Technology University

Institution Submitting Proposal

Fall 2026
Projected Implementation Date

Bachelor of Science
Award to be Offered

Bachelor of Science in Marine Infrastructure Engineering Technology
Title of Proposed Program

0924
Suggested HEGIS Code

15.1101
Suggested CIP Code

Engineering
Department of Proposed Program

Dr. Mohamed Shehata
Name of Department Head

Dr. Mohamed Ghazy
Dean of Academic

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Contact E-Mail Address

(240) 965-2473
Contact Phone Number

3-2-26
Signature and Date

President/Chief Executive Approval

MARCH 2, 2026
Date

Date Endorsed/Approved by Governing Board

Bachelor of Science

in

Marine Infrastructure Engineering Technology

Capitol Technology University
Laurel, Maryland

A. Centrality to Mission and Planning Priorities

1. Program Description and Alignment with Institutional Mission

The Bachelor of Science in Marine Infrastructure Engineering Technology is a 120-credit undergraduate engineering technology program designed to prepare students to design, construct, inspect, rehabilitate, and manage marine and coastal infrastructure systems using applied engineering principles and construction technologies. The program emphasizes structural systems, marine hydrodynamics, corrosion control, offshore construction methods, and infrastructure resilience through a strong foundation in mathematics, physics, materials science, construction systems, and applied engineering analysis.

Unlike traditional civil engineering programs that focus heavily on theoretical structural modeling and advanced calculus-based analysis, the Marine Infrastructure Engineering Technology program emphasizes applied engineering practice, field-based systems integration, inspection methodologies, and marine infrastructure lifecycle management. Students develop technical expertise in coastal and offshore infrastructure systems, marine foundations, corrosion mitigation technologies, structural inspection and non-destructive testing methods, and infrastructure rehabilitation strategies in marine and coastal environments.

The curriculum includes coursework in algebra and trigonometry, applied calculus, physics, chemistry, statics, mechanics of materials, structural analysis, reinforced concrete and steel design, construction methods, environmental systems, and electrical and digital infrastructure technologies. Specialized marine courses integrate coastal hydrodynamics, offshore construction practices, corrosion control and cathodic protection systems, inspection technologies, and infrastructure resilience planning. A two-semester senior design sequence ensures that students apply applied engineering technology principles to real-world marine infrastructure challenges, incorporating technical performance, durability, safety, environmental considerations, cost, and ethical responsibilities.

The program aligns directly with the mission of Capitol Technology University to educate individuals for professional opportunities in engineering, computer and information sciences, and business. The B.S. in Marine Infrastructure Engineering Technology supports this mission by delivering a workforce-aligned engineering technology program grounded in applied learning, interdisciplinary integration, and hands-on laboratory and field-oriented experience.

Graduates will be prepared for careers in marine construction technology, coastal infrastructure systems, port and harbor operations, bridge inspection and rehabilitation, offshore wind support systems, corrosion engineering technology, and related infrastructure sectors.

The program also advances Capitol's Strategic Vision 2025 by expanding distinctive applied engineering offerings, strengthening laboratory-centered and industry-focused education, and supporting enrollment growth through innovative programming aligned with infrastructure modernization and coastal resilience priorities.

2. Explanation of How the Proposed Program Supports the Institution's Strategic Goals and Institutional Priorities

The proposed Bachelor of Science in Marine Infrastructure Engineering Technology directly supports Capitol Technology University's strategic goals by introducing a distinctive applied engineering technology degree aligned with growing workforce demand in coastal infrastructure, offshore construction, marine systems rehabilitation, port modernization, and infrastructure resilience.

The program contributes to Goal I: Expand Educational Offerings and Increase Program Completion by offering a unique engineering technology degree that attracts students interested in infrastructure systems, construction technology, marine applications, and applied structural engineering. It provides a pathway for high school graduates seeking applied engineering education as well as transfer students from community colleges in engineering technology, construction management, electronics, or related technical fields.

The program aligns with Goal II: Increase Enrollment and Institutional Awareness by positioning Capitol as a provider of specialized marine and coastal infrastructure engineering technology education distinct from traditional civil engineering programs. Its emphasis on offshore construction, inspection technologies, corrosion mitigation, and resilience planning strengthens Capitol's identity as an applied engineering institution responsive to workforce and infrastructure needs.

The program supports Goal III: Improve the Utilization of University Resources and Institutional Effectiveness by leveraging existing strengths in engineering technology, construction management, structural systems, materials science, and applied physics. Foundational courses are already offered within current programs, enabling efficient implementation with minimal additional instructional investment. The five newly developed marine infrastructure courses build upon existing faculty expertise and laboratory infrastructure, supplemented by adjunct faculty with industry experience as enrollment grows.

The program advances Goal IV: Increase the Number and Scope of Partnerships through opportunities to collaborate with marine construction firms, port authorities, offshore wind developers, engineering consulting firms, infrastructure inspection companies, and government agencies within Maryland and the Mid-Atlantic region. Capstone projects, internships, and

industry-sponsored applied design experiences will enhance experiential learning and employer engagement.

Institutional prioritization of the program is demonstrated by:

a) Development under the leadership of the Dean of Academic Affairs as part of Capitol's strategic expansion into high-demand applied engineering and infrastructure fields.

b) Review and prioritization through Academic Council and institutional planning discussions emphasizing workforce-responsive engineering technology programs.

c) Alignment with existing faculty expertise in structural systems, construction management, materials science, environmental systems, and applied engineering analysis.

d) Support for enrollment strategies that emphasize distinctive, interdisciplinary engineering technology programs attractive to both traditional and transfer students.

e) Strategic reinforcement of Capitol's identity as a forward-looking, applied STEM institution focused on infrastructure modernization, coastal resilience, and emerging technology sectors.

3. Description of How the Program Will Be Adequately Funded for at Least the First Five Years

The Bachelor of Science in Marine Infrastructure Engineering Technology will be funded through internal institutional resources, shared instructional capacity across engineering technology and construction programs, and projected tuition revenue growth. A detailed financial analysis is provided in Section L.

Many core courses required for the program—including mathematics, physics, chemistry, statics, mechanics of materials, structural analysis, construction methods, environmental systems, programming, and electrical systems—are currently offered within existing programs. These shared courses minimize the need for additional full-time faculty hires during initial program implementation.

Existing laboratory infrastructure, including engineering mechanics laboratories, materials testing equipment, construction management labs, computing facilities, and electrical systems laboratories, already supports key components of the curriculum. Marine-specific instructional enhancements—such as corrosion demonstration modules, inspection technologies, and coastal modeling tools—will be introduced incrementally through modest capital investments during the first three years of operation.

Tuition revenue generated through enrollment growth will support instructional costs, laboratory upgrades, adjunct faculty support as needed, and program coordination. The university's financial model anticipates the program achieving sustainable enrollment levels within three to five years.

Additional funding opportunities may include federal infrastructure grants, industry-sponsored applied projects, state infrastructure initiatives, and partnerships with marine construction and offshore energy firms to support experiential learning and workforce development initiatives.

4. Description of the Institution's Commitment to the Program's Long-Term Success

Capitol Technology University is fully committed to the long-term sustainability and success of the B.S. in Marine Infrastructure Engineering Technology.

a) Administrative, Financial, and Technical Support

Administrative oversight will be provided by the Dean of Engineering in coordination with program faculty and institutional support units including Academic Affairs, Institutional Effectiveness, and Information Technology. The program will be incorporated into regular budgeting processes to ensure stable operational support. Laboratory equipment, computing infrastructure, and instructional software will be maintained and upgraded as necessary to support evolving marine infrastructure technologies and industry standards.

b) Continuation for Sufficient Time to Allow Students to Complete the Program

The university commits to maintaining the program for the duration necessary to allow all enrolled students to complete their degrees. In the event of future restructuring, Capitol will implement a formal teach-out plan consistent with regional accreditation standards to ensure uninterrupted academic progression and degree completion for all students.

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

a) The Need for the Advancement and Evolution of Knowledge

The Bachelor of Science in Marine Infrastructure Engineering Technology addresses the evolving technological demands of marine, coastal, and infrastructure sectors, which increasingly rely on applied structural systems, corrosion mitigation technologies, offshore construction methods, inspection technologies, and infrastructure resilience planning. Modern infrastructure development extends beyond traditional construction management to encompass complex, interconnected systems that must withstand marine loading conditions, environmental degradation, climate change impacts, and long-term durability challenges.

Maryland's geographic location and economic structure create a sustained need for professionals with specialized knowledge in marine and coastal infrastructure systems. The state includes

extensive shoreline along the Chesapeake Bay, major port facilities in Baltimore, coastal and riverine transportation systems, offshore wind development initiatives, and aging bridge and waterfront infrastructure requiring inspection, rehabilitation, and modernization. The increasing frequency of severe weather events and sea-level rise further intensify the demand for infrastructure professionals trained in resilience and coastal systems protection.

Unlike traditional civil engineering programs that emphasize theoretical modeling and advanced structural analysis, the Marine Infrastructure Engineering Technology program focuses on applied engineering practice, construction systems integration, corrosion control technologies, inspection methodologies, and infrastructure lifecycle management in marine environments. Graduates will contribute to the advancement of knowledge in offshore construction practices, coastal infrastructure resilience, structural inspection technologies, corrosion mitigation strategies, and applied marine systems integration—areas that are increasingly critical to ensuring infrastructure safety, reliability, and sustainability in Maryland and nationally.

b) Societal Needs, Including Expanding Educational Opportunities and Choices for Minority and Educationally Disadvantaged Students at Institutions of Higher Education

The proposed program expands access to high-impact engineering technology education for students interested in infrastructure systems, marine construction, and applied structural technologies but who may not pursue traditional calculus-intensive engineering pathways. By structuring the curriculum around applied mathematics, physics, construction systems, and field-oriented engineering practice, the program provides a rigorous yet accessible pathway for students from diverse academic backgrounds, including transfer students from community colleges and students from underrepresented groups in engineering disciplines.

Capitol Technology University serves a diverse student population and maintains a strong commitment to supporting minority, first-generation, and non-traditional students in STEM fields through small class sizes, individualized advising, hands-on laboratory instruction, and project-based learning. The Marine Infrastructure Engineering Technology program provides an additional pathway for students to enter high-demand infrastructure sectors without the barrier of advanced theoretical coursework not directly required for applied industry roles.

By offering this program, Capitol broadens educational choice within Maryland's higher education landscape and supports equitable access to engineering technology careers that offer strong earning potential, workforce stability, and meaningful societal impact through infrastructure modernization and coastal resilience initiatives.

c) The Need to Strengthen and Expand the Capacity of Historically Black Institutions to Provide High Quality and Unique Educational Programs

Although Capitol Technology University is not a historically black institution (HBI), the proposed program complements statewide efforts to expand access to high-quality STEM education and supports opportunities for inter-institutional collaboration.

Maryland's HBIs—including Morgan State University, Bowie State University, Coppin State University, and the University of Maryland Eastern Shore—play a vital role in advancing diversity in STEM fields. The Marine Infrastructure Engineering Technology program may support collaborative articulation agreements, shared infrastructure research initiatives, transfer pathways, and cross-institutional partnerships that enhance educational opportunities across the state.

The applied, marine-focused, and inspection-oriented nature of this program provides a distinctive academic model that complements existing civil engineering and construction programs at HBIs. Capitol's willingness to pursue cooperative partnerships contributes to statewide capacity building and supports Maryland's broader objective of expanding high-quality STEM education across institutions serving diverse populations.

2. Provide Evidence that the Perceived Need is Consistent with the Maryland State Plan for Postsecondary Education

The 2022 Maryland State Plan for Postsecondary Education establishes three overarching goals: (1) Student Access, (2) Student Success, and (3) Innovation. Each goal is supported by specific statewide priorities. The proposed Bachelor of Science in Marine Infrastructure Engineering Technology aligns with these goals and directly advances multiple identified priorities in the State Plan.

Goal 1: Student Access

"Ensure equitable access to affordable and quality postsecondary education for all Maryland residents."

The Marine Infrastructure Engineering Technology program expands access to applied engineering technology education for students interested in infrastructure modernization, marine systems, offshore construction, and coastal resilience. The program creates an accessible pathway for high school graduates, transfer students from Maryland community colleges, working adults in construction or inspection fields, and underrepresented minority students seeking entry into high-demand infrastructure sectors.

The program directly supports:

- **Priority 1: Affordability and Financial Access** by providing a degree pathway aligned with high-demand infrastructure careers that offer strong wage potential and long-term employment stability in Maryland's maritime, transportation, and energy sectors.
- **Priority 2: Transfer and Articulation** by facilitating structured transfer pathways from community college programs in construction management, engineering technology, electronics, and related technical disciplines into a specialized four-year applied engineering degree.
- **Priority 4: Equitable Access for Underrepresented Students** by expanding entry points into engineering technology fields through applied mathematics and hands-on

learning models that reduce barriers associated with highly theoretical, calculus-intensive engineering pathways.

Through these priorities, the program enhances equitable participation in Maryland's infrastructure and coastal development workforce.

Goal 2: Student Success

"Promote and implement practices and policies that will ensure student success."

The Marine Infrastructure Engineering Technology curriculum integrates laboratory-intensive instruction, applied field-oriented coursework, structured advising, and a two-semester capstone sequence focused on real-world marine and coastal infrastructure challenges. Students engage in project-based learning that emphasizes inspection technologies, corrosion mitigation, offshore construction methods, and resilience planning.

The program advances:

- **Priority 5: Completion and Degree Attainment** by incorporating structured advising, early-alert systems, scaffolded prerequisites, and applied learning approaches that promote persistence and timely graduation.
- **Priority 6: Workforce Preparation and Career Readiness** by aligning coursework with Maryland's infrastructure priorities, including port operations, coastal protection, offshore wind support, bridge rehabilitation, and marine construction. The curriculum emphasizes industry-relevant skills such as structural inspection, non-destructive testing, corrosion control, and construction systems integration.
- **Priority 7: Data-Informed Student Success Strategies** through continuous assessment of student performance in laboratory and applied courses to improve instructional effectiveness and retention outcomes.

By embedding applied technical competencies within a supportive academic structure, the program directly strengthens career readiness and long-term student achievement.

Goal 3: Innovation

"Foster innovation in all aspects of Maryland higher education to improve access and student success."

The Marine Infrastructure Engineering Technology program reflects innovation in academic design by integrating coastal hydrodynamics, marine construction technologies, corrosion engineering, infrastructure inspection systems, and resilience planning within a single applied engineering technology framework. This interdisciplinary approach responds to evolving infrastructure challenges associated with climate change, sea-level rise, offshore energy expansion, and aging transportation systems.

The program supports:

- **Priority 8: Academic Innovation and Modernization** by modernizing engineering technology education to incorporate infrastructure resilience, marine environmental considerations, and applied inspection technologies that reflect emerging industry standards.
- **Priority 9: Work-Based Learning and Industry Partnerships** through the incorporation of internships, industry-sponsored capstone projects, and partnerships with marine construction firms, port authorities, offshore wind developers, and infrastructure inspection organizations.
- **Priority 10: Economic and Workforce Development Alignment** by preparing graduates to contribute directly to Maryland's infrastructure renewal initiatives, maritime economy, coastal protection efforts, and energy transition projects.

Through this integrated and workforce-responsive model, the program advances Maryland's statewide objectives related to innovation, applied learning, and economic competitiveness in infrastructure-intensive sectors.

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

1. Describe Potential Industries, Employment Opportunities, and Expected Level of Entry for Graduates of the Proposed Program

Graduates of the Bachelor of Science in Marine Infrastructure Engineering Technology will be prepared for employment in industries that design, construct, inspect, rehabilitate, and manage marine and coastal infrastructure systems. The program prepares graduates for roles requiring strong applied engineering foundations combined with structural systems knowledge, marine hydrodynamics awareness, corrosion mitigation expertise, and construction technology competencies.

Primary employment sectors include:

• Marine and offshore construction firms
• Port and harbor authorities
• Coastal engineering and infrastructure consulting firms
• Bridge inspection and structural rehabilitation companies
• Offshore wind development and support services
• Transportation and public works agencies
• Infrastructure inspection and non-destructive testing firms
• Industrial storage tank and pipeline service companies

Representative entry-level positions include:

• Marine Infrastructure Engineering Technologist
• Coastal Systems Engineering Technician

• Offshore Construction Technologist
• Bridge Inspection Specialist
• Structural Inspection and NDT Technician
• Corrosion Control Technologist
• Infrastructure Rehabilitation Technologist
• Port Infrastructure Systems Coordinator

These positions typically require a bachelor's degree in engineering technology and involve applied structural evaluation, inspection and testing, construction coordination, corrosion mitigation planning, and infrastructure systems integration. Graduates will generally enter the workforce as junior engineering technologists, inspection specialists, or construction systems coordinators, with advancement opportunities into project supervision, infrastructure management, resilience planning, and technical leadership roles.

The program's emphasis on applied structural systems, inspection technologies, corrosion control, offshore construction methods, and resilience planning positions graduates to contribute immediately within infrastructure-focused organizations serving Maryland's coastal and maritime economy.

2. Present Data and Analysis Projecting Market Demand and Availability of Openings

National labor data demonstrate sustained demand for professionals in infrastructure-related engineering and engineering technology fields.

According to the U.S. Bureau of Labor Statistics (BLS):

• Employment of Civil Engineering Technologists and Technicians is projected to grow approximately 5 percent from 2022 to 2032.
• Employment of Civil Engineers is projected to grow 6 percent during the same period, reflecting ongoing infrastructure investment nationwide.
• Median annual wages for civil engineering technologists and technicians exceed $58,000, while civil engineers earn median wages exceeding $90,000.
• Employment in construction management occupations is projected to grow approximately 4 percent, with median annual wages exceeding $100,000.

In addition to standard occupational projections, federal infrastructure initiatives and state-level investments significantly influence demand. The Infrastructure Investment and Jobs Act and related state funding programs are directing substantial investment into bridge rehabilitation, port modernization, coastal resilience projects, offshore wind development, and climate adaptation infrastructure.

Maryland's geographic and economic characteristics further support demand:

• Extensive Chesapeake Bay shoreline requiring coastal protection and infrastructure resilience
• Port of Baltimore operations supporting maritime commerce and logistics
• Offshore wind development initiatives along the Mid-Atlantic coast

• Aging bridge and waterfront infrastructure requiring inspection and rehabilitation
• Public works modernization efforts across state and local governments

The Maryland Department of Labor identifies construction, transportation infrastructure, environmental systems, and advanced manufacturing as priority growth sectors. Infrastructure inspection, rehabilitation, and marine construction roles are included within high-demand STEM occupational categories.

Maryland's continued investment in coastal protection, transportation systems, and offshore energy infrastructure supports sustained demand for graduates trained in applied marine infrastructure technologies.

3. Evidence from Market Surveys and Workforce Development Reports

The Georgetown University Center on Education and the Workforce projects that over 70 percent of jobs in Maryland will require postsecondary education by 2031, with strong demand in STEM-related fields including infrastructure, construction, and applied engineering sectors.

The Maryland Statewide Workforce Development Plan (2024–2028) identifies infrastructure modernization, transportation systems, environmental sustainability, and advanced manufacturing as priority economic sectors. The plan emphasizes workforce preparation aligned with state and federal infrastructure investment and resilience initiatives.

Job posting analytics from platforms such as Lightcast and LinkedIn consistently show employer demand in Maryland for positions such as:

• Civil Engineering Technologist
• Construction Engineering Technologist
• Structural Inspector
• Bridge Inspection Engineer/Technician
• Infrastructure Project Coordinator
• Offshore Construction Specialist
• Corrosion Engineer/Technician
• Marine Construction Supervisor

Major employers posting such positions include engineering consulting firms, marine construction contractors, port authorities, transportation agencies, infrastructure inspection firms, and offshore energy developers operating within the state. The frequency of these postings reflects sustained demand for graduates with applied infrastructure and marine systems competencies.

4. Current and Projected Supply of Prospective Graduates

Maryland institutions currently award bachelor's degrees in civil engineering, construction management, and engineering technology disciplines. According to IPEDS data, several hundred bachelor's degrees are awarded annually in civil engineering and related fields across Maryland institutions.

However, these programs are generally:

• Traditional civil engineering programs emphasizing theoretical modeling
• Construction management programs focusing on project coordination
• General engineering technology programs without marine specialization

Few undergraduate programs in the state emphasize:

• Coastal and marine hydrodynamics
• Offshore construction methods
• Corrosion control and cathodic protection technologies
• Structural inspection and non-destructive testing in marine environments
• Integrated infrastructure resilience planning specific to coastal systems

The proposed Bachelor of Science in Marine Infrastructure Engineering Technology fills a niche by focusing on applied marine and coastal infrastructure systems rather than general civil or construction pathways. The program complements existing offerings while expanding the diversity of infrastructure-focused engineering technology education models available within the state.

Institutional enrollment projections indicate:

• 15 students in Year 1
• 45–60 students by Year 5
• 10–15 graduates annually by Year 5

These graduates will contribute to Maryland's marine construction, port operations, infrastructure rehabilitation, and coastal resilience workforce without significantly duplicating traditional civil engineering degree pathways.

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

The proposed Bachelor of Science in Marine Infrastructure Engineering Technology is classified under CIP 15.1101 – Engineering Technology, General. A comprehensive review of Maryland institutions offering bachelor's degree programs under this CIP classification and programs with related titles—including Marine Science, Environmental Science with marine or coastal concentrations, Civil Engineering, Engineering Technology, and Construction Management—was conducted to evaluate potential program duplication.

The review included examination of program titles, curricular structure, disciplinary focus, and intended workforce outcomes across public and private institutions in Maryland. This review included programs such as Environmental Science and Policy with a concentration in Marine and Coastal Management at the University of Maryland, College Park, and Environmental Science with a Marine Ecology concentration at the University of Maryland Eastern Shore. While several programs share partial similarities in subject matter such as infrastructure systems, construction processes, or marine environments, meaningful differences exist in

academic orientation, level of applied engineering technology integration, and specialization in marine infrastructure systems.

Marine and Marine-Related Programs

St. Mary's College of Maryland – Bachelor's Degree in Marine Science

Similarities

- Both programs address systems operating in marine or coastal environments.
- Both programs include study of coastal processes and marine-related systems.

Differences

- The Marine Science program focuses on **marine biology, oceanography, and environmental science**, preparing students primarily for research and environmental science careers.
- The proposed Marine Infrastructure Engineering Technology program focuses on **engineering technology applications related to infrastructure systems operating in marine environments**, including coastal structures, offshore construction systems, corrosion protection technologies, and infrastructure resilience planning.
- The Marine Science program is science-based, while the proposed program is an **applied engineering technology program focused on infrastructure systems and engineering implementation**.

Civil Engineering Programs

Bachelor's degree programs in Civil Engineering are offered by:

- **Capitol Technology University – B.S. in Civil Engineering**
- **Johns Hopkins University – B.S. in Civil Engineering**
- **Morgan State University – B.S. in Civil Engineering**
- **University of Maryland, College Park – B.S. in Civil Engineering**

These programs are typically classified under **CIP 14.0801 – Civil Engineering**.

Similarities

- All programs address infrastructure systems such as bridges, transportation systems, and structural design.
- All programs include coursework related to engineering mechanics, materials, and structural systems.
- Both the civil engineering programs and the proposed program address infrastructure development and maintenance.

Differences

- Civil Engineering programs are **calculus-intensive engineering degrees emphasizing theoretical modeling, structural analysis, geotechnical engineering, transportation engineering, and advanced engineering design**.
- These programs are structured primarily to prepare graduates for **professional engineering licensure (PE) and graduate engineering study**.
- The proposed Marine Infrastructure Engineering Technology program is an **applied engineering technology degree**, emphasizing infrastructure implementation, inspection technologies, corrosion mitigation systems, offshore construction methods, and infrastructure rehabilitation rather than theoretical structural design.
- The proposed program also incorporates **marine and coastal infrastructure specialization**, which is not a central focus of traditional civil engineering curricula.

Engineering Technology Programs

Bachelor's degree programs in Engineering Technology in Maryland include:

- **Capitol Technology University – B.S. in Engineering Technology**
- **University of Maryland Eastern Shore – B.S. in Engineering Technology**
- **Capitol Technology University – B.S. in Computer Engineering Technology**
- **Capitol Technology University – B.S. in Electronics Engineering Technology**
- **Capitol Technology University – B.S. in Healthcare Engineering Technology**
- **Notre Dame of Maryland University – B.S. in Healthcare Engineering Technology**

Similarities

- These programs emphasize **applied engineering principles, laboratory-based instruction, and implementation of engineering systems**.
- The programs share an emphasis on **engineering technology education designed to prepare graduates for applied technical roles in industry**.
- Some courses in mathematics, physics, and engineering fundamentals may overlap with the foundational courses in the proposed program.

Differences

- Existing engineering technology programs in Maryland focus on **electronics systems, computing systems, healthcare technologies, or general engineering technology applications**.
- None of these programs specialize in **marine infrastructure systems, offshore construction technologies, corrosion control engineering, or infrastructure inspection methods**.
- The proposed Marine Infrastructure Engineering Technology program introduces a **distinct specialization focused on coastal infrastructure systems, structural inspection, corrosion mitigation technologies, marine construction systems, and infrastructure resilience planning**, which are not central components of the existing engineering technology programs.

Marine and Coastal Environmental Programs

Two institutions in Maryland offer programs related to marine and coastal environments that share partial topical relevance to the proposed program.

- The **University of Maryland, College Park** offers the *Environmental Science and Policy* program with an Area of Concentration in **Marine and Coastal Management**. This program examines coastal ecosystems, environmental policy, marine resource management, and sustainable development of coastal regions.
- The **University of Maryland Eastern Shore** offers an *Environmental Science* program with a **Marine Ecology** concentration. This program focuses on marine ecosystems, fisheries science, coastal environmental processes, and ecological monitoring.

Similarities:
Both programs address marine and coastal environments and include study of coastal systems and environmental conditions that influence coastal regions. These programs share a general contextual overlap with the proposed Bachelor of Science in Marine Infrastructure Engineering Technology in that they examine issues affecting coastal areas and marine environments.

Differences:
The Environmental Science and Policy program at the University of Maryland, College Park and the Environmental Science program at the University of Maryland Eastern Shore focus primarily on **environmental science, marine ecology, ecosystem management, and coastal policy**. In contrast, the proposed Bachelor of Science in Marine Infrastructure Engineering Technology focuses on **applied engineering technology related to the design, construction, inspection, and maintenance of marine infrastructure systems**. The proposed curriculum emphasizes coastal hydrodynamics, offshore construction methods, corrosion control technologies, structural inspection, non-destructive testing, and infrastructure resilience planning. As such, the proposed program prepares graduates for **engineering technology roles in marine infrastructure development and maintenance**, whereas the programs at these institutions prepare students for careers in **environmental science, marine ecology, and coastal resource management**.

Construction Management Programs

Bachelor's degree programs in Construction Management or related fields are offered by:

- **Capitol Technology University – B.S. in Construction Management**
- **Frostburg State University – B.S. in Sustainable Construction Management**
- **Loyola University Maryland – B.S. in Construction Management and Real Estate**
- **Morgan State University – B.S. in Construction Management**
- **University of Maryland Eastern Shore – B.S. in Construction Management Technology**

Similarities

- These programs address construction processes, project planning, and infrastructure development.
- Students in these programs may study construction methods, materials, and infrastructure systems.
- The proposed program also includes coursework related to construction methods and infrastructure development.

Differences

- Construction management programs emphasize **project scheduling, cost estimation, contract management, and construction administration**.
- These programs focus primarily on **management and administrative aspects of construction projects rather than engineering technology analysis or infrastructure inspection systems**.
- The proposed Marine Infrastructure Engineering Technology program focuses on **engineering technology preparation related to infrastructure systems**, including structural inspection methods, corrosion control technologies, coastal hydrodynamics, infrastructure rehabilitation, and applied structural systems analysis.
- The proposed program therefore emphasizes **engineering technology and infrastructure systems analysis rather than construction project management**.

Programs within the Engineering Technology CIP Family

A review of programs within the broader **CIP 15 – Engineering Technologies/Technicians** classification in Maryland identified numerous programs offered primarily by community colleges in areas such as electronics technology, robotics technology, manufacturing technology, drafting technology, and HVAC systems.

Most of these programs are **associate degree or certificate programs** designed to prepare students for entry-level technician positions. These programs differ from the proposed program in several key ways:

1. They are primarily **two-year technician programs**, not four-year bachelor's degrees.
2. They focus on **specific technical skill areas such as electronics, manufacturing, robotics, or drafting**, rather than infrastructure systems.
3. They do not address **marine infrastructure engineering technology or coastal infrastructure resilience**.

Among bachelor's degree programs in this classification, the **University of Maryland Eastern Shore offers a B.S. in Engineering Technology**, which provides a general engineering technology curriculum without specialization in marine infrastructure systems.

2. Justification for the Proposed Program

The proposed **Bachelor of Science in Marine Infrastructure Engineering Technology** is justified by demonstrated workforce demand, academic distinctiveness, and institutional

capacity to deliver a high-quality applied engineering technology program aligned with Maryland's infrastructure and maritime priorities.

Maryland maintains significant investment in **transportation infrastructure, port modernization, coastal protection systems, offshore wind energy development, and bridge rehabilitation**. Employers in marine construction, infrastructure inspection, port operations, and coastal engineering sectors require professionals with applied structural systems knowledge, corrosion mitigation expertise, inspection competencies, and infrastructure resilience planning capabilities.

While Maryland institutions offer civil engineering and construction management programs, **no existing program integrates marine infrastructure specialization within an engineering technology framework**. The proposed program fills this gap by emphasizing **offshore construction systems, inspection technologies, corrosion protection methods, and coastal infrastructure resilience**.

The program also leverages Capitol Technology University's existing strengths in **engineering technology, structural systems, construction management, materials science, and applied engineering analysis**, enabling efficient use of faculty expertise and laboratory resources.

By providing a specialized applied engineering technology pathway focused on marine infrastructure systems, the proposed program **complements rather than duplicates existing programs in Maryland** while supporting statewide workforce needs related to infrastructure modernization and coastal resilience.

For these reasons, the **Bachelor of Science in Marine Infrastructure Engineering Technology** is academically justified and strategically positioned to address emerging workforce needs in Maryland's marine and coastal infrastructure sectors.

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 HBIs

The proposed Bachelor of Science in Marine Infrastructure Engineering Technology is designed to complement—rather than compete with—high-demand engineering and engineering technology programs currently offered by Maryland's Historically Black Institutions (HBIs). Institutions such as Morgan State University, Bowie State University, Coppin State University, and the University of Maryland Eastern Shore play an essential role in advancing diversity, equity, and access within engineering, construction, and STEM education. Their programs in civil engineering, construction management, and related fields are critical to Maryland's workforce development objectives and to expanding representation in infrastructure-focused careers.

Morgan State University, a designated Historically Black Institution, offers several programs related to infrastructure and engineering systems, including a **Bachelor of Science in Civil**

Engineering and a **Bachelor of Science in Construction Management**. These programs provide strong preparation in traditional civil engineering disciplines, structural systems, transportation infrastructure, and construction project management. The proposed **Marine Infrastructure Engineering Technology** program shares certain foundational elements related to infrastructure systems and construction methods; however, it differs significantly in academic orientation and specialization. The proposed program emphasizes **applied engineering technology related specifically to marine and coastal infrastructure systems**, including coastal hydrodynamics, offshore construction methods, corrosion control and cathodic protection technologies, structural inspection and non-destructive testing, and infrastructure resilience planning for coastal environments.

The **University of Maryland Eastern Shore (UMES)**, also a designated Historically Black Institution, offers programs in Environmental Science that include a **Marine Ecology concentration** addressing coastal ecosystems, marine biodiversity, and environmental monitoring. While this program shares a marine context with the proposed Marine Infrastructure Engineering Technology program, the academic focus differs substantially. The UMES program emphasizes **marine biology, environmental science, and ecological systems**, preparing students for careers in marine science, environmental research, and ecosystem management. In contrast, the proposed Marine Infrastructure Engineering Technology program focuses on **applied engineering technology associated with the design, construction, inspection, and maintenance of marine infrastructure systems**, including offshore construction methods, corrosion control technologies, structural inspection, non-destructive testing, and coastal infrastructure resilience planning. As a result, the proposed program complements the environmental and ecological focus of the UMES program while serving a distinct workforce need in applied infrastructure engineering technology.

The Marine Infrastructure Engineering Technology program at Capitol Technology University therefore represents a **distinct applied engineering technology specialization** that complements existing HBI programs. While HBI engineering programs focus on traditional civil engineering analysis, infrastructure design, and construction management, the proposed program concentrates on **applied infrastructure technologies and inspection systems within marine and coastal environments**.

The curriculum is structured around applied engineering technology, inspection methodologies, construction systems integration, and infrastructure lifecycle management rather than advanced theoretical civil engineering modeling. This applied marine orientation creates a distinctive academic model that complements existing HBI engineering pathways without replicating them.

The program is also structured to serve a distinct and complementary student demographic, including transfer students from community colleges in construction management and engineering technology programs, working professionals in infrastructure and inspection fields, and students seeking applied engineering roles in marine and coastal systems. Its engineering technology orientation may attract students whose interests align more closely with applied infrastructure systems, inspection technologies, and offshore construction practices rather than traditional civil engineering licensure pathways.

Rather than diminishing HBI programs, the Marine Infrastructure Engineering Technology program may support them in several ways:

• By expanding overall statewide capacity to meet growing employer demand in coastal protection, marine construction, port modernization, offshore wind support, and infrastructure rehabilitation.

• By creating potential articulation pathways and transfer agreements that allow students from HBI institutions or affiliated community colleges to pursue specialized upper-level coursework in marine infrastructure technology.
• By supporting collaborative industry engagement initiatives in areas such as bridge inspection, coastal resilience projects, infrastructure rehabilitation, and marine construction technologies.
• By reinforcing Maryland's broader objective of increasing participation in infrastructure and engineering careers without displacing existing institutional missions.

The introduction of this program will not reduce enrollment or diminish institutional support for high-demand HBI engineering or construction programs. Instead, it provides a complementary applied marine infrastructure model that expands educational options, strengthens statewide workforce responsiveness, and supports Maryland's commitment to inclusive excellence in STEM and infrastructure-related education.

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

1. Discuss the Program's Potential Impact on the Uniqueness and Institutional Identities and Missions of HBIs

The proposed Bachelor of Science in Marine Infrastructure Engineering Technology is not expected to negatively impact the uniqueness, institutional missions, or enrollment priorities of Maryland's Historically Black Institutions (HBIs). Rather, the program complements statewide efforts to expand access to high-quality, workforce-aligned engineering and infrastructure education in marine, coastal, and applied engineering technology fields.

Maryland's HBIs—including Morgan State University, Bowie State University, Coppin State University, and the University of Maryland Eastern Shore—play a central role in advancing educational opportunity, academic excellence, research engagement, and leadership development for historically underrepresented populations in STEM disciplines. Their missions emphasize access, equity, community impact, and preparation for professional careers in engineering, public infrastructure, environmental systems, and related fields.

The proposed Marine Infrastructure Engineering Technology program differs in curricular structure and academic emphasis. While some HBIs offer civil engineering, construction management, or related engineering programs, the Capitol program is structured around applied marine and coastal infrastructure systems, offshore construction technologies, corrosion control and cathodic protection systems, structural inspection and non-destructive testing methodologies, and infrastructure resilience planning specific to coastal environments.

The focus of the program is on applied engineering technology, construction systems integration, inspection technologies, and infrastructure lifecycle management within marine contexts rather than traditional civil engineering theory or research-intensive environmental modeling. Its emphasis on field-oriented practice, inspection systems, and marine infrastructure resilience reflects Capitol Technology University's institutional identity as an applied, laboratory-centered engineering institution emphasizing hands-on learning and industry-aligned preparation.

This distinctive approach does not replicate the academic models, research missions, or civil engineering pathways of HBIs but instead contributes a complementary engineering technology pathway within Maryland's higher education landscape.

The program may also support collaborative opportunities that reinforce HBI missions, including articulation agreements, shared capstone initiatives, cooperative infrastructure projects, industry partnerships in marine construction and coastal resilience, and joint workforce development initiatives aligned with Maryland's infrastructure modernization priorities.

By expanding educational options in a high-demand infrastructure sector without altering the academic missions or enrollment strategies of HBIs, the Marine Infrastructure Engineering Technology program respects institutional uniqueness while advancing Maryland's shared goals of increasing diversity, workforce readiness, and innovation within STEM and infrastructure-focused education.

G. Adequacy of Curriculum Design, Program Modality, and Related Learning Outcomes

1. Description of Program Development and Faculty Oversight

The Bachelor of Science in Marine Infrastructure Engineering Technology was developed through a collaborative process involving faculty from Capitol Technology University's School of Engineering and academic leadership within the Office of Academic Affairs. The program was designed in response to workforce demand for professionals capable of supporting marine construction, coastal infrastructure systems, structural inspection, corrosion mitigation, and infrastructure resilience initiatives across Maryland and the Mid-Atlantic region.

Program development included review of national engineering technology curricula in civil, construction, and marine-related disciplines; consultation with industry professionals in marine construction, port infrastructure, offshore energy, inspection services, and infrastructure rehabilitation; and alignment with Engineering Technology Accreditation Commission (ETAC) of ABET criteria.

The curriculum builds upon Capitol's established strengths in engineering technology, construction management, structural systems, materials science, environmental systems, and applied laboratory instruction.

Many foundational courses—including mathematics, physics, chemistry, statics, mechanics of materials, structural analysis, construction methods, environmental systems, programming, and electrical systems—are already offered within existing programs. Five new marine-specific courses were developed to address:

- Coastal and marine hydrodynamics
- Offshore construction systems
- Corrosion control and cathodic protection

• Structural inspection and non-destructive testing
• Infrastructure resilience and rehabilitation

The program is structured to meet ETAC-ABET expectations for baccalaureate engineering technology programs by ensuring:

• Appropriate mathematics and applied science preparation
• Significant applied engineering technology content
• Integration of design and practical application throughout the curriculum
• A culminating two-semester capstone design sequence

The program will be overseen by full-time faculty holding doctoral or master's degrees in engineering, engineering technology, construction management, or closely related disciplines. Faculty expertise includes structural systems, construction management, environmental systems, materials science, electrical systems, and applied engineering design. Adjunct faculty with professional experience in marine construction, corrosion control, inspection services, or infrastructure rehabilitation may support upper-level courses and capstone mentorship as enrollment grows.

2. Educational Objectives and Student Learning Outcomes

Program Modality

The Marine Infrastructure Engineering Technology program will be delivered primarily in a face-to-face format on campus to ensure strong laboratory engagement and applied learning experience. Selected foundational courses may be offered in hybrid format where appropriate; however, core engineering technology courses, marine specialization courses, and senior design experiences will be delivered in person to maintain laboratory rigor and project-based learning quality.

The curriculum emphasizes:

• Applied laboratory instruction
• Materials testing and structural evaluation
• Inspection methodologies and non-destructive testing
• Coastal system analysis
• Construction systems integration
• Team-based engineering design

Program Educational Objectives

Within three to five years of graduation, alumni of the Marine Infrastructure Engineering Technology program are expected to:

1. Be employed in marine construction, coastal infrastructure, inspection services, offshore systems support, infrastructure rehabilitation, or related engineering technology fields.
2. Apply applied engineering principles and systems thinking to the construction, inspection, evaluation, and rehabilitation of marine and coastal infrastructure systems.

3. Demonstrate professional, ethical, and safety-conscious practice in infrastructure and construction environments.
4. Pursue continued professional development through industry certifications, leadership roles, advanced education, or specialized training in infrastructure-related disciplines.

Student Learning Outcomes

Upon graduation, students will be able to:

1. Apply knowledge of mathematics, science, engineering, and technology to solve broadly defined problems in marine and coastal infrastructure systems.
2. Design systems, components, or processes in applied infrastructure contexts to meet specified needs, considering public safety, environmental impact, sustainability, economic factors, and regulatory constraints.
3. Conduct standard tests, measurements, and experiments; analyze and interpret results; and apply findings to improve structural and infrastructure system performance.
4. Function effectively as a member or leader on technical teams engaged in construction, inspection, and infrastructure projects.
5. Identify, analyze, and solve broadly defined engineering technology problems related to marine structures, corrosion mitigation, inspection systems, and rehabilitation strategies.
6. Communicate effectively in written, oral, and graphical formats with technical and non-technical stakeholders.
7. Recognize professional and ethical responsibilities in infrastructure and public safety contexts.

These outcomes align with ETAC-ABET Student Outcomes for baccalaureate engineering technology programs.

3. Assessment and Documentation of Student Achievement

a) Assessment of Student Learning Outcomes

Student learning outcomes will be assessed using both direct and indirect measures across required courses.

Direct assessment methods include:

• Examinations in mathematics and engineering technology courses
• Laboratory reports and applied structural analyses
• Materials testing and corrosion evaluation projects
• Inspection simulations and non-destructive testing exercises
• Construction systems design projects
• Capstone design project deliverables
• Oral presentations and technical documentation

Each required course includes mapped learning outcomes aligned with program-level outcomes and ETAC criteria. Faculty will use standardized rubrics to evaluate student achievement.

The two-semester Senior Design sequence serves as the primary integrative assessment experience, requiring students to design, evaluate, and propose solutions to real-world marine or coastal infrastructure challenges under practical constraints.

Assessment results will be reviewed annually by program faculty and academic leadership. Continuous improvement actions will be documented and implemented based on assessment findings and advisory board feedback.

b) Documentation of Student Achievement

Capitol Technology University maintains an institution-wide assessment framework to document course-level and program-level learning outcomes. Faculty will archive:

- Assessment instruments
- Student artifacts
- Rubrics
- Capstone reports and presentations
- Annual outcome summaries

These materials will support continuous improvement processes and future ETAC-ABET accreditation review.

4. Program Requirements and Course Structure

The Bachelor of Science in Marine Infrastructure Engineering Technology is a 120-credit engineering technology degree structured to provide strong preparation in applied mathematics, science, structural systems, construction technologies, and marine infrastructure specialization.

The curriculum is distributed across the following categories:

- General Education
- Mathematics and Applied Sciences
- Engineering Technology Core
- Marine Infrastructure Major
- Capstone Design
- Technical Electives

The program includes:

- Applied mathematics and science preparation
- Extensive engineering technology coursework
- Five marine-specific upper-level courses
- A two-semester senior design experience
- Laboratory-intensive instruction in structural systems, inspection technologies, and construction methods

Curriculum Distribution

Bachelor of Science in Marine Infrastructure Engineering Technology (121 Credits)

Category	Description	Credits
General Education	Communication, humanities, ethics, and business coursework supporting professional practice	24
Mathematics and Applied Sciences	Algebra & Trigonometry, Applied Calculus, Statistics, Chemistry, Physics I–II	20
Engineering Technology Core	Structural systems, construction methods, materials, environmental systems, electrical systems, programming	42
Marine Infrastructure Major	Coastal systems, offshore construction, corrosion control, inspection, resilience	16
Capstone Design	Two-semester applied senior design sequence	6
Technical Electives	Upper-level technical coursework	12
Total		**120**

Bachelor of Science in Marine Infrastructure Engineering Technology
Curriculum Structure (120 Credits)

I. General Education (24 Credits)

Course	Credits	Prerequisites
EN 101 – English Composition I	3	Placement or EN 099
EN 102 – English Composition II	3	EN 101
HU 331 – Arts and Ideas	3	EN 102
SS 351 – Ethics	3	EN 102
BUS 174 – Introduction to Business	3	None
BUS 301 – Project Management	3	EN 101 and BUS 174
Social Science Elective	3	Varies
Humanities Elective	3	Varies

II. Mathematics and Applied Sciences (20 Credits)

Course	Credits	Prerequisites
MA 114 – Algebra and Trigonometry	4	MA 112 or placement
MA 201 – Applied Calculus for Technology	4	MA 114 or equivalent
MA 128 – Introduction to Statistics	3	MA 110, MA 111, or MA 112
CH 120 – Chemistry	3	None
PH 201 – General Physics I	3	MA 114
PH 202 – General Physics II	3	PH 201

III. Engineering Technology Core (42 Credits)

Course	Credits	Prerequisites
MEC 210 – Engineering Mechanics – Statics	3	PH 261
MEC 255 – Mechanics of Materials and Materials Science	3	MEC 210
CE 310 – Structural Analysis	3	MEC 255
CE 315 – Design of Reinforced Concrete	3	CE 310
CE 320 – Steel Structure Analysis and Design	3	CE 310
CM 120 – Introduction to Construction Management	3	None
CM 220 – Construction Methods and Materials	3	CM 120 or FM 120 and MA 114
CM 375 – Mechanical and Electrical Construction	3	CM 220
CM 380 – Environmental Systems	3	CH 120, CM 120, CM 250, and PH 201
MEC 375 – Engineering Safety	3	None
EL 120 – Electrical Engineering Technology Systems	3	MA 114 or equivalent
CS 120 – Introduction to Programming Using Python	3	None
NT 100 – Computer Architecture and Construction	3	None
IAE 201 – Introduction to Information Assurance Concepts	3	MA 110 or MA 112 or MA 114 or MA 126

IV. Marine Infrastructure Major (16 Credits – Five New Courses)

Course	Credits	Prerequisites
MIE 301 – Coastal & Marine Hydrodynamics and Infrastructure Systems	4	PH 202 and MEC 210
MIE 302 – Marine & Offshore Construction Methods	3	CM 220
MIE 303 – Corrosion Control & Cathodic Protection Technology	3	CH 120
MIE 304 – Structural Inspection & Non-Destructive Testing	3	MEC 255
MIE 401 – Marine Infrastructure Resilience & Rehabilitation	3	CE 310 and MIE 304

V. Senior Capstone Experience (6 Credits)

Course	Credits	Prerequisites
SDE 457 – Senior Applied Design I	3	Senior Standing
SDE 458 – Senior Applied Design II	3	SDE 457

VI. Technical Electives (12 Credits)

Course	Credits	Prerequisites
Technical Elective 1	3	Varies
Technical Elective 2	3	Varies
Technical Elective 3	3	Varies

Course	Credits	Prerequisites
Technical Elective 4	3	Varies

Courses Descriptions

I. General Education (24 Credits)

EN-101 – English Communications I (3 credits): This introductory college-level course focuses on effective oral and written communication skills and the development of analytical abilities through various reading and writing assignments. Students must demonstrate competence in writing mechanics, including grammar, sentence structure, logical content development, and research documentation through 4 essays/research papers. Rhetorical modes may include description, comparison/contrast, narrative, and process analysis. Students are expected to develop effective oral communication skills through speeches. Group projects will develop effective team skills such as decision-making, time management, and cooperation. Prerequisite(s): Acceptance based on placement test scores.

EN-102 – English Communications II (3 credits): This sequel to EN-101 involves more sophisticated reading, writing, speaking, and research assignments. Students must demonstrate competence in writing mechanics, as well as advanced research skills, the ability to handle complex information, and effective team skills. Students write research papers: an information paper, a cause-and-effect paper, an argument paper, and a final research paper. Course includes group work. Presentations are required. Prerequisite(s): EN 1012.

HU 331 - Arts and Ideas (3 credits): This course enables students to study and appreciate various forms of art, including painting, sculpture, architecture, music, drama, film, and literature through in-class and on-site experiences. The arts are also surveyed from an historical perspective, focusing primarily on eras in Western civilization. This enables students to sense the parallel development of the arts, of philosophy, and of sociopolitical systems and to recognize various ways of viewing reality. Prerequisite(s): EN 102

SS 351 – Ethics (3 credits): This course is designed to help students improve their ability to make ethical decisions. This is done by providing a framework that enables the student to identify, analyze, and resolve ethical issues that arise when making decisions. Case analysis is a primary tool of this course. Prerequisite(s): EN 102

BUS 174 - Introduction to Business and Management (3 credits): This course presents a survey of the general business and management environment. Topics include an introduction to the various forms of business, organizational structure, and their legal implications. Modern management and supervision concepts, history and development of theory and practice, the roles of managers, and the relationship between manager and employee are examined. This is a seminar course with emphasis on class discussion and collaborative learning.

BUS 301 - Project Management (3 credits): This course is an introduction to project management. It covers the origins, philosophy, methodology, and involves actual applications and use of tools such as MS Project. The System Development Cycle is used as a framework to discuss project management in a variety of situations. Illustrative cases are used and project leadership and team building are covered as integral aspects of good project management. Prerequisite(s): BUS 101 or BUS 174

Social Science Elective (3 credits): Introduces students to the study of human behavior, social systems, and economic or institutional interactions through approved courses in fields such as sociology, psychology, economics, or political science. The course helps students understand societal impacts of engineering decisions and supports responsible professional practice.

Humanities Elective (3 credits): Explores human culture, values, and ethical perspectives through approved courses in areas such as history, philosophy, literature, ethics, or cultural studies. The course strengthens critical thinking and ethical awareness for professional decision-making.

II. II. Mathematics and Applied Sciences (20 Credits)

MA 114 - Algebra and Trigonometry (4 credits): Designed for students needing mathematical skills and concepts for MA-261. Topics in this course are as follows. Algebra: basic operations on real and complex numbers, fractions, exponents and radicals. Determinates: Solution of linear, fractional, quadratic and system equations. Trigonometry: definition and identities, angular measurements, solving triangles, vectors, graphs and logarithms. Prerequisite(s): MA 112 or placement test score.

MA 201 – Applied Calculus for Technology (4 credits): This course will introduce differential and integral calculus with an emphasis on practical applications in applied technology fields. Topics include limits, continuity, derivatives, integrals, and basic differential equations, with a focus on modeling and analyzing real-world technological systems. Students will apply calculus concepts to problems involving rates of change, optimization, accumulation, and system behavior in areas such as electronics, automation, energy systems, data analysis, and technology-based processes. The course emphasizes conceptual understanding, computational proficiency, and application rather than formal mathematical proofs. Prerequisite(s): MA 114 or equivalent **MA 128 – Introduction to Statistics (3 Credits):** This course addresses probability: definitions, theorems, permutations and combinations; binomial, hypergeometric, Poisson and normal distributions; sampling distribution and central limit theorem; and estimation and hypothesis testing. Prerequisite: MA 110, MA 111, or MA 112.

CH 120 – Chemistry (3credits): This courses teaches metric system and significant figures, stoichiometry, fundamental concepts of atomic structure and its relationship to the periodic table and electron configuration. Bonds and electronegativity, gases, oxidation states and redox,

solutions, acids and bases, changes of state, thermodynamics, and chemical kinetics and equilibrium are also included. Prerequisite(s): MA 112 or MA 114

PH 201 - General Physics I (3 credits): This is a non-calculus-based physics course intended for credit in engineering technology courses. PH-261 is to be used for electrical, computer, and software engineering courses. PH-201 addresses mechanics, focusing on units, conversion factors, vector diagrams, translational equilibrium, friction, torque and rotational equilibrium, uniformly accelerated motion, projectiles, Newton's Law, work energy and power, kinetic and potential energy, conservation of energy, and impulse and momentum. It also addresses heat, focusing on temperature scales, thermal properties of matter, heat and temperature change, heat and change of phase, physics of heat transfer, and applications. Students completing this course may not enroll in PH-261 for additional credit. Prerequisite(s): MA 114

PH 202 - General Physics II (3 credits): Non-calculus based physics intended for credit in engineering technology courses. Use PH-262 for electrical, computer and software engineering courses. Light and sound: wave motion, nature of light, reflection and mirrors, refraction, prisms, dispersion lenses; simple harmonic motion; sound transmission, resonance, interference. Doppler Effect. Electricity and magnetism: Static electricity, electric fields, magnetic fields, electric potential, capacitance; electricity in motion; magnetic induction; electromagnetic relations. Alternating currents. Prerequisite(s): PH 201

III. Engineering Technology Core (42 Credits)

MEC 210 – Engineering Mechanics – Statics (3 credits): Introduces static equilibrium principles and their applications in engineering systems. Topics include force and moment analysis, centers of gravity, centroids, and moments of inertia. Uses engineering software tools for modeling and visualization. Prerequisite(s): MA 261. Corequisite(s): PH 261

MEC 255 – Mechanics of Materials and Materials Science (3 credits): Covers the mechanical behavior of engineering materials and analysis of stresses, strains, and deformations in structural components under various loading conditions. Topics include axial loading, torsion, bending, shear, and material failure theories. Also introduces the fundamentals of materials science, including crystal structure, phase diagrams, heat treatment, and common failure mechanisms such as fatigue and fracture. Emphasizes applications in aerospace structural design and material selection. Prerequisite(s): MEC 210

CE 310 – Structural Analysis (3 Credits): Covers the analysis of determinate and indeterminate structures subjected to various loading conditions. Topics include static equilibrium, internal forces, influence lines, deflection of beams and trusses, and methods such as moment distribution and stiffness analysis. Computer-aided analysis tools are introduced to complement classical techniques. Emphasis is placed on understanding structural behavior and preparing students for advanced design courses. Prerequisite(s): MEC 255.

CE 315 – Design of Reinforced Concrete (3 Credits): Study of the behavior, analysis, and design of reinforced concrete structural elements in accordance with ACI standards. Topics include material properties, design of beams, slabs, columns, and footings for flexure, shear, and

axial load. Emphasis is placed on load and resistance factor design (LRFD), detailing requirements, and serviceability criteria. Design projects integrate code compliance, constructability, and sustainability. Prerequisite(s): CE 310.

CE 320 – Steel Structure Analysis and Design (3 Credits): Examines the analysis and design of steel structures in accordance with AISC specifications. Topics include design of tension members, compression members, beams, beam-columns, and bolted and welded connections. Students apply both ASD (Allowable Stress Design) and LRFD methods. The course incorporates modern CAD and structural modeling software to develop complete design documentation. Prerequisite(s): CE 310.

CM 120 – Introduction to Construction Management (3 Credits): Introduces students to the principles, practices, and organization of the construction industry. Topics include the history and evolution of construction, roles and responsibilities of project participants, project delivery methods, and the phases of construction management from planning to project closeout. Emphasis is placed on understanding construction contracts, scheduling, safety, and quality control, as well as the interaction among owners, designers, and contractors. Students gain an overview of career paths and management functions within the industry. Prerequisite(s): None

CM 220 – Construction Methods and Materials (3 Credits): Examines the methods, materials, and technologies used in modern construction. Topics include properties, selection, and applications of common construction materials such as concrete, steel, masonry, wood, and composites. Emphasis is placed on vertical construction processes, design specifications, testing and inspection procedures, and appropriate construction methodologies. The course also addresses sustainability, quality assurance, and emerging construction materials. Prerequisite(s): CM 120 or FM 120 and MA 114.CM 375 – Mechanical and Electrical Construction

CM 380 – Environmental Systems (3 Credits): Provides a comprehensive overview of environmental considerations and impacts associated with construction processes. Topics include pollution prevention, waste management, air and water quality protection, and energy-efficient building systems. The course also examines environmental and occupational health hazards, regulatory compliance, and liability issues relevant to construction activities. Emphasis is placed on sustainable construction practices and integration of environmental management into project planning and execution. Prerequisite(s): CH 120, CM 120, CM 250, and PH 201.MEC 375 – Engineering Safety

EL 120 – Electrical Engineering Technology Systems (3 credits): This course will provide a broad, application-oriented introduction to electrical engineering technology systems. Topics include basic electrical circuits, analog electronic devices, digital logic fundamentals, electric machines, and power conversion concepts. Emphasis is placed on understanding how electrical subsystems function and interact within modern technological applications such as automation, robotics, facilities, and intelligent systems. Laboratory activities focus on safe operation, measurement techniques, and hands-on exploration of electrical, electronic, and

electromechanical components rather than detailed theoretical analysis. Prerequisite(s): MA 114 or equivalent

CS 120 - Introduction to Programming Using Python (3 credits): The course will cover basic concepts and elements of computer programming using Python. Topics include variables, constants, operators, expressions, statements, branching, loops, and functions. Additionally, Python specific data structures, built-in functions, library modules and working with external files will be applied in developing working code.

NT 100 – Computer Architecture and Construction (3 credits): This course will provide a basic introduction to the design, assembly, and configuration of contemporary personal computer systems. Topics include computer architecture components, operating systems installation and configuration, and the use of diagnostic and troubleshooting software. Students will build, configure, test, and troubleshoot PC systems through hands-on laboratory activities. The course provides foundational knowledge that may be used as preparation for the CompTIA A+ certification examination.

IAE 201 – Introduction to Information Assurance Concepts (3 Credits): This course covers topics related to administration of network security. Topics include a survey of encryption and authentication algorithms; threats to security; operating system security; IP security; user authentication schemes; web security; email security protocols; intrusion detections; viruses; firewalls; Virtual Private Networks; network management and security policies and procedures. Laboratory projects are assigned as part of the homework requirements. Classes are a mixture of lecture, current event discussions, and laboratory exercises. NOTE: Students enrolled in this course incur an additional lab fee of $100.

IV. Marine Infrastructure Major (16 Credits – Five New Courses)

MIE 301 – Coastal & Marine Hydrodynamics and Infrastructure Systems (4 credits): This course will provide an applied introduction to coastal and marine hydrodynamic principles as they relate to infrastructure systems in nearshore and offshore environments. Topics include wave mechanics, tidal forces, storm surge impacts, sediment transport, coastal erosion processes, and hydrodynamic loading on marine structures such as piers, seawalls, offshore platforms, and bridge foundations. Emphasis is placed on understanding how water forces interact with structural systems and how environmental conditions influence design, construction, and maintenance decisions. Laboratory and applied problem-solving activities focus on interpreting hydrodynamic data and evaluating infrastructure performance rather than advanced theoretical modeling. Prerequisite(s): PH 201, and MA 201

MIE 302 – Marine & Offshore Construction Methods (3 credits): This course will provide a practical examination of construction methods and technologies used in marine and offshore environments. Topics include marine foundations, pile driving operations, cofferdams, caissons, dredging, underwater concreting, offshore wind support structures, floating systems, and marine equipment selection. Emphasis is placed on construction sequencing, environmental constraints, safety procedures, and logistical planning in tidal and coastal conditions. Students

will analyze real-world construction scenarios to understand coordination challenges unique to marine infrastructure projects. Prerequisite(s): CM 220

MIE 303 – Corrosion Control & Cathodic Protection Technology (3 credits): This course will provide an application-oriented study of corrosion mechanisms affecting marine and coastal infrastructure systems. Topics include electrochemical corrosion processes, galvanic reactions, material degradation in saltwater environments, protective coatings, material selection strategies, and cathodic protection system fundamentals. Emphasis is placed on practical corrosion mitigation techniques used in bridges, offshore structures, pipelines, storage tanks, and port facilities. Laboratory demonstrations and case studies focus on inspection, monitoring, and maintenance planning rather than detailed electrochemical theory. Prerequisite(s): CH 120 and MEC 255

MIE 304 – Structural Inspection & Non-Destructive Testing (3 credits): This course will provide an applied introduction to structural inspection methodologies and non-destructive testing (NDT) techniques used in infrastructure systems. Topics include visual inspection protocols, ultrasonic testing, magnetic particle testing, radiographic methods, dye penetrant inspection, vibration monitoring, and structural health assessment technologies. Emphasis is placed on identifying structural defects, interpreting test results, and documenting findings to support maintenance and safety decisions. Laboratory activities focus on safe operation of testing equipment and applied condition assessment procedures rather than advanced theoretical derivations. Prerequisite(s): MEC 255 and CE 310

MIE 401 – Marine Infrastructure Resilience & Rehabilitation (3 credits): This course will provide an advanced, application-oriented study of rehabilitation strategies and resilience planning for aging marine and coastal infrastructure systems. Topics include structural deterioration assessment, retrofit techniques for concrete and steel systems, load capacity evaluation, climate adaptation strategies, sea-level rise considerations, storm resilience planning, and infrastructure lifecycle management. Emphasis is placed on developing practical solutions that improve durability, safety, and long-term performance of marine structures. Case studies and applied project work focus on evaluating real-world infrastructure systems and proposing rehabilitation strategies within economic and environmental constraints. Prerequisite(s): CE 315, and MIE 304

V. Senior Capstone Experience (6 Credits)

SDE 457 – Senior Design I (3 credits): Students/teams select a project, develop an understanding of the project scope that includes research and documentation of related work, prepare a feasibility study, develop project requirements (constraints) and engineering, software, and/or security specifications, propose solutions and multiple designs, analyze proposed designs, select a final proposed design, and prepare and present a preliminary design review (PDR). Students are expected to apply proper systems engineering and project management to their work. Additional components may be required in some projects. Students/teams submit a final report at the end of the semester. Note: Course must be completed with a grade of “C” or higher to enroll in SDE 458. (This course was formerly AE 457,

BUS 457, CE 457, CS 457, EE 457, IAE 457, SE 457, UAS 457 and MEC 455). Prerequisite(s): Senior standing

SDE 458 – Senior Design II (3 credits): Students/teams build and test their selected designs (completed in SDE 457). Each student team delivers a tested prototype and defends its project in front of a panel of experts. Students/teams submit a final report that includes description of the design, realization, and test processes as well as test results, discussion, and conclusion. Failure to deliver a completed design and a working prototype that meets engineering, software, and/or security specifications by the end of the semester may result in failing the course. Note: Course must complete with a grade of "C" or higher to meet undergraduate graduation requirements. (This course was formally AE 458, BUS 458, CE 458, CS 458, EE 458, IAE 458, SE 458, UAS 458 and MEC 462). Prerequisite(s): SDE 457

VI. Technical Electives (12 Credits)

Technical Electives (12 credits): This requirement allows students to complete upper-level technical courses that enhance knowledge in marine infrastructure, structural systems, construction technologies, inspection methods, environmental systems, or related applied engineering areas. Electives support career specialization and reinforce professional preparation in marine and coastal infrastructure environments. Courses must be approved by the program advisor. Prerequisite(s): Varies by selected course

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

The Bachelor of Science in Marine Infrastructure Engineering Technology fully satisfies the general education requirements established by the Maryland Higher Education Commission (MHEC) and the standards outlined in COMAR 13B.02.03. The curriculum includes 24 credits of designated general education coursework designed to promote critical thinking, effective communication, ethical reasoning, and an understanding of professional and societal responsibilities in infrastructure and public works environments.

The general education component includes English composition (EN 101 and EN 102), humanities (HU 331 – Arts and Ideas), ethics (SS 351 – Ethics), and foundational business coursework (BUS 174 – Introduction to Business and BUS 301 – Project Management). Social science and humanities electives further broaden students' understanding of societal systems, policy contexts, and environmental considerations affecting infrastructure development.

Quantitative reasoning and scientific literacy are addressed through 20 credits of required coursework in algebra and trigonometry, applied calculus, statistics, chemistry, and physics. These courses provide the analytical and scientific foundation required for applied structural analysis, marine systems evaluation, and infrastructure technology applications.

This structure ensures that graduates possess not only strong applied technical preparation but also the communication skills, ethical judgment, and societal awareness necessary to function effectively as engineering technology professionals in marine and coastal infrastructure environments.

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

Capitol Technology University intends to pursue accreditation for the Bachelor of Science in Marine Infrastructure Engineering Technology from the Engineering Technology Accreditation Commission (ETAC) of ABET, consistent with the university's accreditation strategy for applied engineering technology programs.

The curriculum has been designed to meet ETAC General Criteria for Baccalaureate-Level Engineering Technology Programs, particularly Criterion 5: Curriculum.

a) General Criteria – Curriculum Requirements

The curriculum includes:

• Appropriate mathematics and applied sciences, including algebra and trigonometry, applied calculus, statistics, chemistry, and physics.
• A substantial component of engineering technology topics, including statics, mechanics of materials, structural analysis, reinforced concrete and steel systems, construction methods, environmental systems, electrical systems, programming, and marine infrastructure specialization.
• A major design experience (SDE 457 and SDE 458) based on knowledge and skills acquired in earlier coursework and focused on applied marine infrastructure problem-solving under realistic technical, environmental, safety, and economic constraints.

b) Program Criteria – Engineering Technology (Civil/Construction-Oriented)

As a marine-focused applied infrastructure program, the degree will be reviewed under ETAC criteria applicable to civil engineering technology, construction engineering technology, or similarly titled programs. The curriculum emphasizes:

• Applied structural systems analysis
• Construction systems integration in marine environments
• Corrosion mitigation and cathodic protection technologies
• Inspection methodologies and non-destructive testing
• Infrastructure rehabilitation and resilience planning
• Consideration of safety, environmental sustainability, regulatory compliance, and professional responsibility

Accreditation will be pursued following the graduation of the program's first cohort. Graduates of ETAC-accredited programs may pursue professional certifications and, where applicable, licensure pathways consistent with state regulations governing engineering technology practice.

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

This program does not involve any contractual agreements with other institutions or non-collegiate organizations. All instruction, curriculum development, academic oversight, laboratory activities, and student support services for the Bachelor of Science in Marine

Infrastructure Engineering Technology will be provided exclusively by Capitol Technology University using existing faculty, instructional facilities, laboratories, and administrative resources.

8. Provide assurance that students will receive clear, complete, and timely information

Capitol Technology University affirms that students enrolled in the Bachelor of Science in Marine Infrastructure Engineering Technology program will be provided with accurate, complete, and timely information regarding all academic and administrative aspects of the program.

Information will be provided through the following mechanisms:

• The academic catalog and program webpage will include detailed information on curriculum structure, credit requirements, course descriptions, learning outcomes, prerequisites, and degree pathways. These resources are reviewed annually for accuracy and compliance.

• Upon admission, students are assigned an academic advisor who provides individualized degree planning, prerequisite tracking, and professional guidance related to infrastructure and engineering technology career pathways.

• Each course includes a detailed syllabus outlining course objectives, assessment methods, laboratory requirements, safety expectations, faculty office hours, and communication protocols.

• Technology and equipment expectations, including required software and minimum laptop specifications, are clearly communicated through the Office of Information Technology.

• Capitol uses Canvas as its official learning management system. Course materials, laboratory instructions, assignments, and grading information are delivered through this platform, and students receive orientation and technical support.

• Academic support services—including tutoring, writing assistance, library services, and research support—are available both in person and online. Career services assist students with internships, resume preparation, and employment placement in infrastructure-related industries.

• Tuition, fee schedules, financial aid policies, payment options, and scholarship information are clearly communicated by the Financial Aid and Business Offices.

These measures ensure that students receive consistent, transparent, and comprehensive information throughout their enrollment.

9. Provide assurance that advertising, recruiting, and admissions materials will clearly and accurately represent the proposed program

Capitol Technology University affirms that all advertising, recruitment, and admissions materials related to the Bachelor of Science in Marine Infrastructure Engineering Technology will accurately and clearly represent the program's academic content, structure, outcomes, and available services.

The Office of Marketing and Communications, in collaboration with academic leadership, will ensure that all promotional materials:

• Accurately reflect the approved curriculum and learning outcomes
• Clearly state total credit requirements and program structure
• Transparently communicate tuition, fees, laboratory expectations, and technology requirements
• Accurately describe the applied engineering technology focus and marine infrastructure specialization of the program

Program information will be disseminated through the university website, academic catalog, brochures, recruitment events, open houses, and articulation partner visits. Admissions counselors and faculty representatives will provide consistent and accurate information during advising and recruitment interactions.

All materials will be reviewed periodically to ensure compliance with institutional policy and accreditation standards, thereby ensuring that prospective students receive reliable information necessary to make informed educational decisions.

H. Adequacy of Articulation

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

The Bachelor of Science in Marine Infrastructure Engineering Technology is designed to support seamless transfer and articulation with community colleges and other institutions offering associate degrees in engineering technology, construction management, engineering science, and related STEM disciplines. The program's structure emphasizes foundational coursework in mathematics, physics, chemistry, construction systems, materials, and applied engineering technology, all of which align with standard lower-division transfer pathways across Maryland's community college system.

The Marine Infrastructure Engineering Technology curriculum has been intentionally aligned with **Maryland Higher Education Commission (MHEC) transfer guidelines** to facilitate credit recognition and efficient academic progression. Lower-division coursework in algebra and trigonometry, applied calculus, physics, chemistry, programming, and introductory construction and engineering technology closely mirrors coursework commonly offered in Maryland community college engineering technology and construction-related programs. This alignment allows students completing associate-level STEM degrees to transfer efficiently into the upper-division coursework of the Marine Infrastructure Engineering Technology program.

Capitol Technology University maintains several institutional articulation agreements with regional community colleges and partner institutions. However, these agreements are **not currently program-specific to the proposed Marine Infrastructure Engineering Technology degree**. Therefore, no articulation agreements specific to this program are included at this time.

Following program approval, Capitol Technology University will work with Maryland community colleges and other partner institutions to establish **program-specific articulation agreements** that support transfer pathways into the Marine Infrastructure Engineering Technology program, particularly for students completing associate degrees in engineering technology, construction management, civil technology, or related infrastructure disciplines.

The university also supports early STEM pipeline development through dual enrollment initiatives, Project Lead The Way (PLTW) participation, and partnerships with regional high schools. These initiatives strengthen preparation in mathematics, applied engineering fundamentals, and technical disciplines, supporting student readiness for entry into the Marine Infrastructure Engineering Technology program.

I. Adequacy of Faculty Resources

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

The Bachelor of Science in Marine Infrastructure Engineering Technology will be delivered by a team of full-time engineering and construction faculty supported, as needed, by qualified adjunct instructors with specialized expertise in marine construction, structural systems, safety, and inspection technologies. Faculty members hold terminal degrees in engineering, mechanical engineering, computer science, analytical chemistry, project management, and related technical disciplines. Collectively, they bring academic, laboratory, and industry experience relevant to structural systems, infrastructure rehabilitation, materials science, safety engineering, environmental systems, and applied engineering technology.

The program leverages Capitol Technology University's existing strengths in engineering technology, structural analysis, construction management, environmental systems, electrical systems, and applied laboratory instruction. Faculty assigned to the program have experience teaching core engineering technology subjects such as statics, mechanics of materials, structural analysis, reinforced concrete and steel design, construction systems, environmental systems, programming, and senior design. These courses form the backbone of the marine infrastructure curriculum.

Marine-specific coursework—including Coastal & Marine Hydrodynamics, Marine & Offshore Construction Methods, Corrosion Control & Cathodic Protection Technology, Structural Inspection & Non-Destructive Testing, and Marine Infrastructure Resilience & Rehabilitation—will be taught by faculty with appropriate backgrounds in structural systems, construction engineering, materials science, and applied engineering design. Adjunct faculty with professional experience in marine construction, corrosion control, infrastructure inspection, or coastal systems may support specialized upper-level instruction as enrollment grows.

The two-semester Senior Design sequence will be supervised by full-time faculty with experience in multidisciplinary engineering design and applied project oversight, ensuring that students complete rigorous, standards-based capstone projects incorporating realistic technical, environmental, safety, and economic constraints.

The existing faculty complement is sufficient to support program launch. Additional hiring will be considered as enrollment expands.

Faculty Summary Table – Marine Infrastructure Engineering Technology

Faculty Name	Appointment Type	Courses Taught (Course Numbers Only)
Dr. Andrew Mehri	Full-Time	PH 202, EL 120
Dr. Edwige Songong	Part-Time	CE 310, CE 315, MIE 304, SDE 457
Dr. Gregory P. Behrmann	Full-Time	MEC 210, MEC 255, CE 320
Dr. Jeff Chi	Full-Time	BUS 174, BUS 301, CM 120, CM 220, CM 375
Dr. Kellep Charles	Full-Time	IAE 201
Dr. Nick Coleman	Part-Time	MIE 301, MIE 302, MIE 303, MIE 401, SDE 458
Dr. Nisma M. Omar	Full-Time	MA 114, MA 201, MA 128, CH 120, PH 201
Dr. Tahani Baabdullah	Full-Time	CS 120, NT 100
Prof. Jeff Volosin	Full-Time	CM 380, MEC 375
Prof. Megan Miskovish	Part-Time	EN 101, EN 102, HU 331, SS 351

Full-Time Faculty

Dr. Andrew Mehri holds a Ph.D. in Computer Science and brings expertise in electronics, digital systems, and systems integration. He supports physics and technical systems instruction relevant to infrastructure applications, including computational tools, systems analysis, and applied engineering technology foundations.

Dr. Gregory P. Behrmann holds a Ph.D. in Mechanical Engineering and serves as Clinical Associate Professor. He brings research and applied engineering experience in mechanics, materials, and structural systems. He teaches engineering mechanics, materials science, structural analysis, and applied design courses central to infrastructure and structural preparation.

Dr. Jeff Chi holds a Ph.D. in Project Management and brings extensive experience in construction management, facilities operations, sustainability initiatives, and capital project oversight. He supports construction management, project management, and safety components of the program, integrating applied project execution and regulatory awareness into the curriculum.

Dr. Kellep Charles holds a Ph.D. in Cybersecurity and teaches information assurance and applied cybersecurity courses. His expertise supports infrastructure protection, digital systems security, and risk management principles relevant to modern infrastructure environments.

Dr. Nisma M. Omar holds a Ph.D. in Analytical Chemistry and supports foundational mathematics and science coursework critical to materials behavior, corrosion understanding, and scientific literacy required for engineering technology practice.

Dr. Tahani Baabdullah holds a Ph.D. in Computer Science and contributes programming and computational foundations that support infrastructure analysis, data interpretation, and applied modeling within engineering technology contexts.

Prof. Jeff Volosin brings extensive industry and NASA experience in systems integration and large-scale technical operations. He supports environmental systems and systems-based instruction, contributing applied engineering and infrastructure systems expertise.

Part-Time Faculty

Dr. Edwige F. Songong, Adjunct Faculty, holds a Ph.D. in Civil Engineering from the University of Cape Town, along with M.S. degrees in Technology Management, Mathematical Sciences, and Physics. Her research interests include structural dynamics, sustainability, and engineering education. She teaches structural analysis and advanced structural systems and contributes to marine infrastructure and inspection coursework.

Dr. Nick Coleman, P.E., PMP, is a licensed civil engineer and project manager with over 20 years of experience overseeing $1.8 billion in transportation and infrastructure projects at the federal, state, and local levels. He is Founder of Coastline Rail Engineering and brings expertise in bridge design, construction engineering, marine-adjacent infrastructure systems, and project execution. He holds a DBA and M.S. in Project Management and a B.S. in Civil Engineering Technology and is licensed in multiple states.

Ms. Megan Miskovish, Adjunct Faculty, holds an M.S. in Education and teaches English composition and humanities courses. Her instruction supports the development of written communication, critical thinking, and professional documentation skills essential for engineering technology professionals.

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

Capitol Technology University provides structured faculty development through its Center for Innovation in Teaching and Learning (CITL). The Center supports continuous improvement in instructional quality, laboratory effectiveness, student engagement, and technology integration across all academic programs, including engineering technology disciplines.

a) Pedagogy that meets the needs of students

Faculty receive ongoing training in evidence-based instructional strategies that support applied, laboratory-centered engineering technology education. Workshops emphasize:

- Project-based and design-centered instruction
- Active learning in technical and laboratory courses
- Applied problem-solving and case-based instruction

• Inclusive teaching practices and Universal Design for Learning (UDL)
• Rubric-based assessment and scaffolded technical instruction

Because the Marine Infrastructure Engineering Technology program includes structural analysis, inspection methods, hydrodynamics, and construction systems, faculty development emphasizes hands-on engagement, safety-focused laboratory instruction, and structured team-based project learning.

b) Training in the Learning Management System

Canvas is the university's official learning management system. Faculty complete onboarding and receive ongoing training in:

• Modular course design
• Laboratory assignment submission and rubric integration
• Multimedia and simulation tools
• Analytics for monitoring student engagement
• Capstone project coordination

Instructional designers support faculty in structuring applied engineering course shells and integrating technical content.

c) Evidence-based best practices for distance education

The Marine Infrastructure Engineering Technology program is designed to be delivered primarily in a face-to-face format due to its laboratory-intensive and applied construction focus. Core engineering technology laboratories, inspection exercises, and senior design projects require in-person instruction to ensure proper supervision, equipment access, and safety compliance.

While not offered as a fully online degree, faculty are trained in hybrid tools to support supplemental learning, project coordination, and digital submission of technical reports. These enhancements improve instructional effectiveness while preserving the hands-on integrity of the program.

J. Adequacy of Library Resources

1. Describe the library resources available and/or the measures to be taken to ensure resources are adequate to support the proposed program.

Capitol Technology University's Puente Library provides comprehensive academic support through a robust collection of physical and digital resources. For the Bachelor of Science in Marine Infrastructure Engineering Technology, the library's holdings and services are aligned with the interdisciplinary nature of the program, which spans structural engineering technology, construction management, materials science, environmental systems, inspection technologies, corrosion control, and infrastructure resilience.

Students and faculty have access to major scholarly databases including IEEE Xplore, ScienceDirect, SpringerLink, ProQuest, JSTOR, and Gale Academic resources. These databases provide full-text access to peer-reviewed journals, industry publications, conference proceedings, case studies, and technical standards relevant to:

- Structural analysis and materials science
- Construction engineering and management
- Coastal and marine systems
- Infrastructure inspection and non-destructive testing
- Environmental systems and sustainability
- Corrosion control and cathodic protection
- Infrastructure resilience and rehabilitation

In addition, the library provides access to applied engineering and construction-focused materials through discipline-specific databases and industry publications. These resources support coursework in structural systems, reinforced concrete and steel design, hydrodynamics, offshore construction methods, and infrastructure rehabilitation.

Reference materials and current textbooks used in the program—including those covering statics, mechanics of materials, structural analysis, construction methods, corrosion engineering, environmental systems, and project management—are available in both print and digital formats. Course reserves are maintained to ensure equitable access to high-demand materials.

The Puente Library also supports access to technical standards and codes commonly referenced in engineering technology programs, including materials related to structural design standards, safety codes, environmental regulations, and inspection practices. As the program develops, additional standards relevant to marine and coastal infrastructure (e.g., corrosion protection guidelines, coastal engineering references, construction codes) will be added as needed.

Measures to Ensure Adequate Support

Capitol Technology University follows a continuous improvement model to ensure library resources remain aligned with programmatic needs.

- Annual collection reviews will assess the adequacy and currency of materials specific to marine infrastructure engineering technology.
- Faculty may recommend journals, eBooks, industry manuals, and standards documentation for acquisition, with priority given to resources supporting upper-division marine courses and senior design.
- The library will expand holdings in areas such as coastal engineering, marine construction practices, corrosion mitigation technologies, infrastructure asset management, and resilience planning.
- Remote access to online databases will be maintained, ensuring both on-campus and hybrid learners have full access to scholarly resources.

- Interlibrary loan services provide access to specialized technical references not held locally.
- Librarians offer research consultations and information literacy instruction to support capstone research, technical report writing, and standards-based project development.

Capitol Technology University affirms that the Puente Library's existing infrastructure, digital access model, acquisition policies, and responsive support services are fully adequate to support the launch and sustained operation of the Bachelor of Science in Marine Infrastructure Engineering Technology program.

K. Adequacy of Physical Facilities, Infrastructure, and Instructional Equipment

1. Provide an assurance that physical facilities, infrastructure, and instructional equipment are adequate to initiate the program.

Capitol Technology University affirms that it possesses the physical facilities, infrastructure, and instructional equipment necessary to successfully launch and sustain the Bachelor of Science in Marine Infrastructure Engineering Technology. The University's campus in Laurel, Maryland includes modern classrooms, engineering laboratories, collaborative design spaces, and faculty offices that fully support applied engineering technology education.

Classroom Facilities

Instruction will be delivered in technology-enabled classrooms equipped with:

- High-definition projection systems
- Smartboards and multimedia display systems
- Document cameras
- Integrated audio-visual systems
- High-speed wired and wireless internet connectivity

These classrooms support lecture-based instruction, collaborative learning, technical demonstrations, and software-based modeling relevant to structural and marine infrastructure applications.

Engineering and Infrastructure Laboratories

The Marine Infrastructure Engineering Technology program will utilize existing engineering and construction laboratories currently supporting applied engineering and construction programs. These facilities are fully adequate to support program launch without requiring immediate capital expansion.

Laboratory resources include:

Structural and Materials Laboratories

Supporting instruction in statics, mechanics of materials, and structural analysis. Equipment includes:

- Universal testing machines
- Material testing apparatus
- Structural load frames and beam testing setups
- Concrete and steel specimen preparation tools
- Measurement instrumentation and strain analysis tools

These facilities support reinforced concrete, steel systems, materials behavior, and structural inspection coursework.

Construction and Environmental Systems Laboratories

Supporting applied coursework in construction methods, environmental systems, and infrastructure technology. Resources include:

- Construction materials demonstration systems
- Building systems models
- Environmental systems training equipment
- Mechanical and electrical construction trainers

Inspection and Non-Destructive Testing (NDT) Equipment

Supporting coursework in Structural Inspection & Non-Destructive Testing (MIE 304), including:

- Visual inspection and measurement tools
- Ultrasonic and rebound testing devices
- Surface evaluation and defect detection instruments
- Corrosion assessment equipment

As enrollment grows, additional NDT training equipment will be acquired to expand hands-on capacity.

Marine and Coastal Systems Instructional Resources

Marine-focused coursework will utilize:

- Hydrodynamics modeling software
- Structural simulation platforms
- Case-based infrastructure datasets
- Applied project analysis tools

Instruction emphasizes modeling, analysis, and systems-level evaluation rather than large-scale wet lab infrastructure, making current facilities sufficient for program launch.

Senior Design and Capstone Studio Spaces

Dedicated collaborative spaces allow interdisciplinary student teams to:

- Design and evaluate marine infrastructure solutions
- Develop inspection and rehabilitation plans
- Conduct modeling and simulation
- Prepare technical documentation and presentations

These studios support applied design projects under faculty supervision.

Software Infrastructure

Students have access to:

- MATLAB and engineering modeling software
- Structural analysis and simulation tools
- CAD platforms
- Project scheduling and management software
- Python development environments
- Cloud-based collaboration tools

All software is accessible both on-campus and remotely through institutional licensing and secure network access.

Faculty Offices and Student Support Spaces

Full-time faculty are provided private offices equipped with computing resources, internet access, and advising space. Meeting rooms and collaborative areas support project mentoring, capstone coordination, and student consultations.

Facilities planning and utilization are reviewed annually to ensure adequate capacity as enrollment grows. Should enrollment increase significantly, the University will expand laboratory sections and instructional equipment accordingly.

Capitol Technology University affirms that its existing physical infrastructure and instructional equipment are fully adequate to initiate and support the Bachelor of Science in Marine Infrastructure Engineering Technology program.

2. Provide assurance that students and faculty in distance education will have adequate access to required systems.

Although the Marine Infrastructure Engineering Technology program is primarily delivered in a traditional, on-campus format due to its laboratory and applied construction focus, the University maintains robust infrastructure to support hybrid and distance-enhanced instruction.

a) Institutional Electronic Mailing System

All students, faculty, and staff are issued official university email accounts through Microsoft Office 365. These accounts are used for:

- Academic communications
- Course announcements
- Advising correspondence
- Assignment notifications
- Institutional alerts

The system integrates with Canvas, Microsoft Teams, and cloud-based storage platforms to ensure seamless communication.

b) Learning Management System (LMS)

Canvas serves as the University's official Learning Management System. It supports:

- Course content delivery
- Assignment submission and grading
- Discussion boards and collaboration tools
- Integrated quizzes and examinations

- Multimedia instructional content
- Real-time analytics and feedback

Canvas integrates with external technical platforms including MATLAB tools, Turnitin, Microsoft Teams, and cloud-based collaboration systems.

Faculty complete onboarding and advanced LMS training through the Center for Innovation in Teaching and Learning (CITL). Students receive orientation and ongoing technical support through IT Services.

All LMS services are accessible remotely, ensuring equitable access to course materials and digital tools for all students.

L. Adequacy of Financial Resources with Documentation

1. Complete Table 1: Resources and Narrative Rationale

TABLE 1: RESOURCES

Resource Categories	Year 1	Year 2	Year 3	Year 4	Year 5
1. Reallocated Funds	$0	$0	$0	$0	$0
2. Tuition/Fee Revenue (c + g below)	$350,060	$707,940	$1,065,072	$1,449,072	$1,851,644
a. Number of F/T Students	8	16	24	32	40
b. Annual Tuition/Fee Rate	$27,808	$28,503	$29,216	$29,946	$30,695
c. Total F/T Revenue (a x b)	$222,464	$465,048	$701,184	$958,272	$1,227,800
d. Number of P/T Students	7	13	19	25	31
e. Credit Hour Rate	$1,519	$1,557	$1,596	$1,636	$1,677
f. Annual Credit Hours	12	12	12	12	12
g. Total P/T Revenue (d x e x f)	$127,596	$242,892	$363,888	$490,800	$623,844
3. Grants, Contracts, External Sources	$0	$0	$0	$0	$0
4. Other Sources	$0	$0	$0	$0	$0
TOTAL (Add 1–4)	**$350,060**	**$707,940**	**$1,065,072**	**$1,449,072**	**$1,851,644**

Narrative Rationale for Table 1: Program Resources

1. Reallocated Funds

No existing funds will be reallocated. The Marine Infrastructure Engineering Technology program will launch using Capitol Technology University's existing infrastructure, faculty expertise, and laboratory facilities without negatively impacting other programs.

2. Tuition and Fee Revenue

Revenue projections are based on conservative enrollment growth beginning with:

- 8 full-time and 7 part-time students in Year 1
- Growing to 40 full-time and 31 part-time students by Year 5

Tuition rates reflect the University's published rates with an estimated 2.5% annual increase. Full-time students are charged the annual tuition rate. Part-time students are estimated to enroll in 12 credit hours per year.

The revenue model demonstrates strong sustainability by Year 3, with substantial positive margin growth by Year 4 and Year 5.

3. Grants, Contracts, and External Sources

No external funding is assumed in the initial five-year projection. However, potential future funding opportunities may include:

- Infrastructure resilience and coastal engineering grants
- Workforce development funding in construction and infrastructure sectors
- Industry-sponsored capstone projects
- Federal or state infrastructure modernization initiatives

These potential sources are not included in the conservative financial model.

4. Other Sources

No endowment, donor, or sponsorship revenue is assumed in the first five years. Any future external support will supplement — not replace — tuition-based sustainability.

2. Complete Table 2: Program Expenditures and Narrative Rationale

TABLE 2: EXPENDITURES

Expenditure Categories	**Year 1**	**Year 2**	**Year 3**	**Year 4**	**Year 5**
1. Faculty (b + c below)	$113,468	$155,071	$238,421	$325,843	$417,486
a. #FTE	1.5	2	3	4	5
b. Total Salary	$94,557	$129,226	$198,684	$271,536	$347,905
c. Total Benefits (20%)	$18,911	$25,845	$39,737	$54,307	$69,581
2. Admin Staff (b + c below)	$5,942	$6,091	$6,244	$6,400	$6,559
a. #FTE	0.08	0.08	0.08	0.08	0.08
b. Total Salary	$4,952	$5,076	$5,203	$5,333	$5,466
c. Total Benefits	$990	$1,015	$1,041	$1,067	$1,093
3. Support Staff (b + c below)	$59,885	$92,076	$125,837	$161,230	$198,313
a. #FTE	1	1.5	2	2.5	3
b. Total Salary	$49,905	$76,730	$104,864	$134,358	$165,261
c. Total Benefits (20%)	$9,980	$15,346	$20,973	$26,872	$33,052
4. Technical Support and Equipment	$15,000	$20,000	$25,000	$30,000	$35,000
5. Library	$0	$0	$0	$0	$0
6. New or Renovated Space	$0	$0	$0	$0	$0
7. Other Expenses	$10,000	$18,000	$30,000	$45,000	$60,000
TOTAL (Add 1–7)	**$204,295**	**$291,238**	**$424,502**	**$568,473**	**$717,358**

Narrative Rationale for Table 2: Program Expenditures

1. Faculty

Faculty costs support instruction across structural systems, construction methods, inspection technologies, corrosion control, environmental systems, and senior capstone supervision. FTE increases proportionally with enrollment growth. Benefits are calculated at 20% of salary.

2. Administrative Staff

A dedicated portion (0.08 FTE) of administrative support is allocated for advising, scheduling, enrollment coordination, and program documentation.

3. Support Staff

Support staff include laboratory coordinators and technical assistants who maintain structural testing equipment, inspection tools, and applied construction training systems. Staffing grows as enrollment and lab sections increase.

4. Technical Support and Equipment

This category reflects realistic engineering technology needs and includes:

- Structural testing equipment maintenance
- Non-destructive testing tools
- Corrosion monitoring instruments
- Software licenses (structural analysis, CAD, modeling tools)
- Laboratory consumables

Annual increases reflect scaling of lab utilization.

5. Library

No additional library expenditures are anticipated due to existing institutional subscriptions and digital resources.

6. New or Renovated Space

No capital expansion is required. Existing engineering laboratories and classrooms are sufficient for program launch.

7. Other Expenses

Includes:

- Program promotion and recruitment
- Guest industry speakers
- Professional development
- Accreditation preparation (ETAC-ABET documentation)
- Capstone materials

Expenses scale with enrollment growth.

Financial Sustainability Summary

The program demonstrates:

- Positive net revenue beginning in Year 1
- Strong surplus growth by Year 3
- Full financial sustainability without reliance on external funding
- Alignment with Capitol Technology University's strategic expansion in applied engineering technology fields

M. Adequacy of Provisions for Evaluation of Program

1. Procedures for Evaluating Courses, Faculty, and Student Learning Outcomes

Capitol Technology University maintains established institutional procedures to ensure academic quality, accountability, and continuous improvement across all undergraduate programs. The Bachelor of Science in Marine Infrastructure Engineering Technology will be evaluated through the following structured processes:

Course Evaluation

Each course is evaluated at the conclusion of every academic term using a standardized university-wide student course evaluation instrument. The instrument measures:

- Clarity of learning objectives
- Organization and delivery of course content
- Effectiveness of instructional methods
- Quality of laboratory and instructional resources
- Student engagement and overall course satisfaction

Results are reviewed by the Program Lead, Department Chair, and the Dean of Academic Affairs. Faculty use feedback to refine course sequencing, laboratory exercises, field-based case studies, inspection activities, and assessment methods.

Faculty Evaluation

Faculty performance is evaluated through a multi-measure approach that includes:

- Student course evaluations
- Peer observation of teaching
- Annual performance review by the Department Chair and Dean

Performance reviews consider instructional quality, laboratory supervision, industry engagement, assessment practices, professional development, and service contributions. This structured review process supports faculty development and instructional effectiveness in applied engineering technology instruction.

Student Learning Outcomes Assessment

Student Learning Outcomes (SLOs) are assessed at both the course and program levels using direct and indirect measures aligned with ABET Engineering Technology Accreditation Commission (ETAC) standards.

Direct measures include:

- Examination performance in structural and engineering science courses
- Laboratory reports and inspection analyses
- Applied construction and materials projects

- Structural modeling and simulation assignments
- Capstone design project evaluations using standardized rubrics

Indirect measures include:

- Student surveys
- Alumni surveys
- Employer and advisory board feedback

Assessment data are collected each semester and reviewed during departmental assessment meetings. Findings are documented in annual assessment reports and used to guide curriculum updates, laboratory equipment enhancements, and instructional improvements. This continuous improvement process aligns with ABET Criterion 4 (Continuous Improvement) for engineering technology programs.

2. Evaluation of Program Educational Effectiveness

The overall effectiveness of the Bachelor of Science in Marine Infrastructure Engineering Technology will be evaluated through a comprehensive institutional assessment framework incorporating academic, operational, and workforce indicators.

Assessment of Student Learning Outcomes

The program will implement a formal outcomes-based assessment plan aligned with ABET ETAC Student Outcomes.

The two-semester senior design sequence (SDE 457 and SDE 458) will serve as the primary integrative assessment point, where students demonstrate competencies in:

- Applied structural and infrastructure design
- Marine and coastal systems analysis
- Corrosion control and inspection methodologies
- Engineering judgment under practical constraints
- Professional and ethical responsibility
- Team-based project execution
- Technical documentation and communication

Capstone reports, inspection analyses, and design documentation will be archived and evaluated annually using standardized rubrics.

Retention and Graduation Rates

Program-level retention and graduation rates will be tracked annually. Institutional early-alert systems, academic advising, tutoring, and faculty mentoring will support student persistence and timely completion.

Trend analysis will inform adjustments to course sequencing, prerequisite structure, laboratory preparation, and student support services.

Student and Faculty Satisfaction

Annual surveys will assess:

- Curriculum rigor and sequencing
- Laboratory adequacy and equipment availability

- Instructional effectiveness
- Advising support
- Career preparation and workforce readiness

Survey findings will be reviewed by program leadership and incorporated into annual improvement planning.

Cost-Effectiveness

The Division of Business and Finance, in coordination with Academic Affairs, will conduct annual financial reviews evaluating:

- Enrollment trends
- Instructional expenditures
- Revenue-to-cost ratios
- Long-term sustainability

These reviews ensure responsible resource allocation and alignment with institutional strategic goals.

Accreditation and Advisory Board Review

The program intends to pursue accreditation from the Engineering Technology Accreditation Commission (ETAC) of ABET following graduation of the first cohort.

An Industry Advisory Board composed of professionals in civil infrastructure, marine construction, structural engineering technology, corrosion control, inspection services, and infrastructure asset management will meet regularly to:

- Review curriculum relevance
- Evaluate workforce alignment
- Identify emerging infrastructure and resilience trends
- Provide recommendations for program enhancement

Advisory board input will be formally documented and incorporated into the program's continuous improvement cycle.

Continuous Improvement Commitment

Capitol Technology University affirms its commitment to maintaining a rigorous, data-informed, and outcomes-driven evaluation process for the Bachelor of Science in Marine Infrastructure Engineering Technology.

Through systematic assessment, advisory engagement, accreditation alignment, and institutional oversight, the program will remain responsive to advancements in marine infrastructure systems, structural technologies, inspection methodologies, sustainability practices, and workforce demands in infrastructure engineering technology.

N. Consistency with the State's Minority Student Achievement Goals

1. Addressing Minority Student Access, Success, and Cultural Diversity Goals

The proposed Bachelor of Science in Marine Infrastructure Engineering Technology supports Maryland's minority student achievement goals as articulated in COMAR 13B.02.03.05 and the Maryland State Plan for Postsecondary Education. Capitol Technology University remains committed to expanding access, promoting retention, and improving completion rates among underrepresented student populations in STEM and applied engineering technology disciplines.

The Marine Infrastructure Engineering Technology program is intentionally structured to enhance equity in access and student success through the following mechanisms:

- Development of clearly defined transfer pathways from Maryland community colleges, including institutions that serve significant populations of minority, first-generation, and adult learners. Existing articulation agreements and targeted advising will support seamless transfer into upper-division coursework.
- Implementation of proactive academic advising and early-alert systems to identify students who may require academic support. Structured mentoring, tutoring services, and faculty engagement are designed to improve persistence in mathematics, science, and engineering technology courses.
- Provision of financial assistance through institutional scholarships, need-based aid, federal grant programs, and military education benefits. These mechanisms reduce financial barriers and support equitable participation in applied engineering programs.
- Faculty participation in professional development focused on inclusive pedagogy, culturally responsive instruction, Universal Design for Learning (UDL), and evidence-based active learning strategies shown to improve retention in engineering and construction-related fields.
- Emphasis on hands-on laboratory instruction, applied field-based case studies, and project-based coursework that supports diverse learning styles and increases engagement in infrastructure, construction, and marine systems contexts.

Capitol Technology University promotes an inclusive campus climate through:

- Student organizations and affinity groups that foster community engagement and peer support
- Multicultural programming and campus-wide events promoting cross-cultural dialogue
- Strategic planning initiatives integrating diversity, equity, and inclusion into enrollment management and academic programming

By expanding access to an applied, workforce-aligned engineering technology degree and strengthening academic support structures, the Bachelor of Science in Marine Infrastructure Engineering Technology advances Maryland's statewide goals related to minority student participation, academic success, and workforce diversity.

The program contributes to reducing equity gaps in infrastructure and construction-related engineering fields and supports the development of a diverse technical workforce prepared to serve Maryland's transportation, coastal, environmental, and civil infrastructure sectors.

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 fiscal resources may be redistributed to this program.

The proposed Bachelor of Science in Marine Infrastructure Engineering Technology is not a direct continuation, redesign, or formal replacement of a program identified by the Maryland Higher Education Commission as low productivity. The program does not involve the elimination of an existing degree nor the reallocation of dedicated budget lines from a Commission-designated low-enrollment program.

The program has been developed within the context of ongoing institutional review of enrollment patterns, workforce alignment, and instructional capacity across engineering and construction-related disciplines. As part of Capitol Technology University's strategic planning and continuous improvement processes, academic leadership routinely evaluates enrollment, retention, graduation trends, and labor market demand to ensure responsible allocation of institutional resources.

In this context, the Marine Infrastructure Engineering Technology program represents a strategic expansion and refinement of existing instructional strengths rather than the creation of a resource-intensive standalone initiative. Specifically:

- Faculty currently supporting engineering technology, construction management, structural systems, and applied science courses will contribute to the marine infrastructure curriculum, increasing instructional efficiency and course utilization.
- Existing laboratory infrastructure supporting mechanics, materials, structural analysis, construction methods, environmental systems, and inspection technologies will be shared across programs, maximizing equipment utilization without requiring substantial capital investment.
- Administrative, advising, and student support services will remain centralized and shared, ensuring operational efficiency while supporting projected enrollment growth.
- Shared foundational coursework in mathematics, physics, construction management, structural systems, and programming reduces duplication and promotes sustainable scheduling practices.

Through these measures, the proposed program enhances academic productivity and strengthens institutional resource alignment without requiring formal redistribution of funds from a Commission-identified low productivity program.

Capitol Technology University affirms that the Bachelor of Science in Marine Infrastructure Engineering Technology reflects responsible academic planning, effective utilization of existing faculty and facilities, and alignment with workforce demand, fiscal sustainability, and institutional strategic priorities.

P. Adequacy of Distance Education Programs

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

Capitol Technology University is fully authorized by the Maryland Higher Education Commission (MHEC) to offer distance education programs. The University has an established record of delivering online and hybrid instruction across undergraduate and graduate programs in engineering technology, computer science, cybersecurity, business, and related applied disciplines.

Capitol Technology University is a participating institution in the National Council for State Authorization Reciprocity Agreements (NC-SARA). Participation in NC-SARA authorizes the University to offer distance education programs to students residing in other SARA member states in compliance with interstate regulatory requirements.

The University maintains the necessary administrative, academic, and technological infrastructure to support distance learning in accordance with regional accreditation standards and state regulatory requirements.

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

Capitol Technology University affirms compliance with the Council of Regional Accrediting Commissions (C-RAC) Guidelines for the Evaluation of Distance Education. Institutional policies and practices ensure that distance education offerings maintain academic rigor, instructional quality, and student support equivalent to on-campus delivery.

The University ensures the following:

- Academic quality and learning outcomes in online and hybrid courses are consistent with those delivered in face-to-face formats. Course objectives, assessment standards, and grading expectations remain identical regardless of instructional modality.
- Regular and substantive faculty-student interaction is maintained through structured online engagement, including virtual office hours, discussion boards, assignment feedback, collaborative project supervision, and scheduled communication.
- Student identity verification is implemented through secure login credentials, institutional authentication systems, and monitored assessment platforms to protect academic integrity.
- Online students have full access to academic advising, tutoring services, library resources, career services, technical support, and financial aid counseling equivalent to services available to campus-based students.
- Canvas serves as the University's official Learning Management System (LMS), providing secure content delivery, assignment submission, grade tracking, communication tools, and integration with engineering and technical software platforms.
- Faculty assigned to online or hybrid instruction complete training in online pedagogy, Canvas functionality, student engagement strategies, and accessibility standards to ensure instructional effectiveness.

The Bachelor of Science in Marine Infrastructure Engineering Technology will be delivered primarily in a traditional, on-campus format due to its laboratory-intensive, construction-based, and inspection-focused components. Core courses in structural systems, materials testing, inspection technologies, and capstone design require hands-on instruction and supervised laboratory engagement.

However, selected general education courses, programming coursework, and certain technical electives may be offered in hybrid or online formats when appropriate. All such offerings will fully comply with institutional policy, C-RAC guidelines, and applicable accreditation standards.