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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 # 99663 (●) Check # 99663

Payment Amount: 850.00

Date Submitted: 2/1/26

Department Proposing Program	Engineering Department	
Degree Level and Degree Type	Bachelor of Science (B.S.)	
Title of Proposed Program	Bachelor of Science in Industrial Engineering Technology	
Total Number of Credits	120	
Suggested Codes	HEGIS: 3507.00	CIP: 15.0613
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: 2-1-26
	Date of Approval/Endorsement by Governing Board:	FEB. 1, 2026

Revised 1/2021

CAPITOL
Technology University

February 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 is requesting approval to offer a Bachelor of Science (B.S.) in Industrial Engineering Technology. The program will be delivered using existing university faculty and supported through integrated coursework in industrial engineering technology, manufacturing systems, quality and process improvement, operations research, supply chain management, and systems integration. Capitol Technology University's mission emphasizes practical, hands-on education in engineering, technology, and business that prepares graduates for professional careers in a dynamic global environment. The university believes that the proposed program aligns closely with this mission.

Demand for professionals skilled in optimizing industrial systems, improving operational efficiency, and integrating people, processes, and technology continues to grow across manufacturing, logistics, infrastructure, defense support, and technology-driven industries. Employers seek graduates with strong applied engineering fundamentals, systems-level understanding, and practical problem-solving experience. The proposed program responds directly to these workforce needs through an applied, technology-focused curriculum.

The Bachelor of Science in Industrial Engineering Technology emphasizes hands-on learning, applied projects, and integrated systems practice to prepare graduates for immediate employment and long-term professional growth. Accordingly, Capitol Technology University respectfully submits this program for approval. Included with this submission is the required letter confirming the adequacy of the university's library resources to support the program.

Respectfully,

Bradford L. Sims, PhD

President

CAPITOL
Technology University

February 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 submitted in response to the request for confirmation regarding the adequacy of Capitol Technology University's library resources to support the proposed Bachelor of Science (B.S.) in Industrial Engineering Technology.

As President of Capitol Technology University, I affirm that the Puente Library, including its physical collections, digital databases, and professional support staff, is fully equipped to support the instructional and research needs of students and faculty in the Bachelor of Science in Industrial Engineering Technology program. The library's existing holdings provide robust access to resources in industrial engineering technology, manufacturing systems, quality control, operations research, supply chain management, systems engineering, automation, data analysis, project management, and related engineering, technology, and applied science disciplines.

Capitol Technology University is committed to the continuous enhancement of its library resources. The institution allocates sufficient funding to ensure that library collections, electronic databases, and instructional materials are regularly reviewed, updated, and expanded in alignment with program development, technological advancements, and evolving industry and workforce needs. This commitment ensures that students enrolled in the Bachelor of Science in Industrial Engineering Technology program have access to the academic and professional resources necessary to support student learning, applied research, and preparation for professional practice.

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 Industrial Engineering Technology.
Title of Proposed Program

3507
Suggested HEGIS Code

15.0613
Suggested CIP Code

Engineering
Department of Proposed Program

Dr. Mohamed Ghazy
Name of Department Head

Dr. Mohamed Ghazy
Dean of Academic

mshehata@captechu.edu
Contact E-Mail Address

(240) 965-2473
Contact Phone Number

2-1-2026
Signature and Date

President/Chief Executive Approval

FEBRUARY 1, 2026
Date

Date Endorsed/Approved by Governing Board

Monday 20, 2025

Bachelor of Science (B.S.) in Industrial 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 Industrial Engineering Technology is a 120-credit undergraduate program designed to prepare students for immediate employment and career advancement in industrial engineering technology, manufacturing systems, operations, and applied systems environments. The program emphasizes the application of engineering principles, quantitative analysis, and systems thinking to improve productivity, quality, efficiency, and decision-making across industrial and service sectors.

The curriculum integrates foundational mathematics and science, engineering and computing competencies, and specialized industrial engineering technology coursework. Students develop applied skills in areas such as work measurement and methods, quality control and statistical process control, manufacturing processes and systems, operations research and optimization, supply chain operations, and operations management. The program also incorporates modern engineering tools and emerging technologies, including automation, microcontroller-based systems, artificial intelligence, information assurance, and Industry 4.0 concepts, reflecting current workforce and industry practices.

The program emphasizes hands-on learning, applied problem-solving, and data-driven decision-making grounded in real-world industrial contexts. A two-semester senior design sequence provides students with the opportunity to apply accumulated knowledge and skills to open-ended, industry-relevant projects that integrate technical, economic, and operational considerations.

In addition to technical preparation, the program includes a strong foundation in mathematics and science, humanities and social sciences, and business and professional practice to promote ethical reasoning, communication skills, teamwork, and an understanding of organizational and societal contexts. The curriculum is intentionally structured to support transfer students from community colleges and applied technology programs while maintaining appropriate academic rigor at the baccalaureate level.

The Bachelor of Science in Industrial Engineering Technology aligns strongly with the mission of Capitol Technology University, which is to “create educational opportunities grounded in practical applications to develop agile professionals in technology-driven fields.” The program fulfills this mission by preparing graduates with applied engineering technology skills, systems-oriented thinking, and interdisciplinary competence suited to modern industrial environments. Graduates will be well positioned for entry-level and mid-level roles in industrial engineering technology, manufacturing operations, quality and process improvement, supply chain and logistics, and related fields, as well as for continued professional development.

The program also supports the university’s strategic vision by delivering workforce-responsive STEM education; fostering interdisciplinary, practice-based learning; supporting innovation and curricular expansion; and contributing to enrollment growth through a market-aligned undergraduate offering.

2. Explanation of how the proposed program supports the institution's strategic goals and evidence of institutional priority

The proposed Bachelor of Science in Industrial Engineering Technology directly supports Capitol Technology University's strategic goals and long-term institutional priorities. The program is intentionally designed to respond to workforce demand for applied industrial engineering technologists with strong analytical, systems, and operational competencies, while making effective use of existing institutional resources.

The program contributes to Goal I: Expand Educational Offerings and Increase Program Completion by introducing a focused, applied engineering technology degree that integrates engineering fundamentals, quantitative analysis, and industrial systems practice. Its structure supports multiple applied pathways through electives and senior design projects, making it accessible to a diverse student population, including students seeking career-oriented education and those transitioning from associate-level engineering technology or industrial technology programs.

The program supports Goal II: Increase Enrollment and Institutional Awareness by appealing to both traditional undergraduate students and transfer students from community colleges. The emphasis on applied industrial engineering skills, manufacturing systems, quality and operations, and emerging technologies is designed to attract students seeking immediate workforce applicability in areas such as advanced manufacturing, operations management, supply chain systems, and process improvement.

The program aligns with Goal III: Improve the Utilization of University Resources and Institutional Effectiveness while Expanding Revenue through its reliance on existing courses, faculty expertise, and laboratory infrastructure. The curriculum leverages Capitol Technology University's established strengths in engineering technology, engineering, computing, and applied systems education, enabling efficient program launch without requiring significant new capital investment.

The program also supports Goal IV: Increase the Number and Scope of Partnerships by providing a curricular framework well suited for collaboration with industry and government employers. The applied and systems-oriented nature of the degree supports workforce development partnerships in sectors such as advanced manufacturing, logistics and supply chain, infrastructure systems, defense-related industries, and technology-enabled operations.

Evidence of institutional priority includes the following:

a. The program was developed under the direction of the Office of Academic Affairs and the Dean of Engineering as part of a strategic curriculum expansion initiative focused on applied, workforce-aligned engineering and technology programs.

b. The program concept has been reviewed and supported through internal academic planning discussions, including undergraduate program development and strategic enrollment planning activities.

c. The curriculum draws upon existing faculty expertise and approved courses across engineering technology, engineering, computing, mathematics, and business, demonstrating efficient use of institutional capacity.

d. The program has been identified as a pathway for attracting and retaining transfer students from community colleges with engineering technology, industrial technology, manufacturing, or applied STEM backgrounds.

e. The applied industrial focus of the program aligns with recent institutional initiatives to strengthen Capitol Technology University's position as a leader in practice-based STEM and technology education.

The Bachelor of Science in Industrial Engineering Technology has been advanced through internal academic planning processes and endorsed by university leadership as a strategic institutional initiative that supports access, enrollment growth, workforce alignment, and curricular modernization.

3. Narrative describing how the proposed program will be adequately funded for at least the first five years

The Bachelor of Science in Industrial Engineering Technology will be funded through a combination of existing institutional resources and strategic allocation of instructional capacity within the School of Engineering and Technology. The program has been incorporated into the university's academic planning and financial forecasting to ensure sustainability during the first five years of implementation.

Most courses included in the program already exist and are currently offered within engineering technology, engineering, computing, mathematics, and business programs. As a result, the program can be launched without significant new investment in course development, facilities, or instructional equipment. Existing laboratories, classrooms, and instructional technologies are sufficient to support the program's applied learning requirements.

Instructional staffing will be provided primarily by existing full-time faculty, with adjunct faculty utilized selectively as enrollment grows or to support specialized subject areas. Faculty workload planning and instructional support have been incorporated into the university's budgeting and staffing models and will be adjusted incrementally based on enrollment demand.

The program is expected to generate tuition revenue sufficient to support instructional and administrative costs. Enrollment projections are conservative and aligned with the university's strategic enrollment growth goals. Financial planning indicates that the program will be self-sustaining through efficient faculty utilization, shared instructional resources, and steady enrollment from both first-time and transfer students.

University leadership, including the Office of Academic Affairs and the Business and Finance teams, has reviewed the program's financial model and confirmed its feasibility. Additional financial details and multi-year projections are provided in Section L of this proposal.

4. Institutional commitment to the proposed program

Capitol Technology University is fully committed to the long-term success and sustainability of the Bachelor of Science in Industrial Engineering Technology. The program has been incorporated into the university's strategic academic planning and is supported by existing administrative, financial, and technical resources.

a) Ongoing administrative, financial, and technical support

Administrative oversight will be provided through the Engineering Department in coordination with the Offices of Academic Affairs, Enrollment Management, and Finance. The Chair of Engineering will oversee curriculum implementation, faculty assignment, scheduling, and continuous program evaluation. Financial support will be integrated into the university's operating budget, with instructional costs supported through faculty workload planning, adjunct hiring, and tuition revenue. Technical support,

including laboratory access, instructional equipment, and information technology resources, is already available through existing university infrastructure and will be maintained and updated as needed.

b) Continuation of the program to allow enrolled students to complete the degree

Capitol Technology University is committed to offering the program for a period sufficient to allow all enrolled students to complete degree requirements. As an accredited institution with a longstanding commitment to student success, the university will ensure continuity of instruction, academic advising, and course availability. Should program modification or discontinuation become necessary, the university will implement a formal teach-out plan consistent with accreditation and regulatory requirements to protect students' academic progress and degree completion.

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

1. Demonstration of demand and need for the program in terms of meeting present and future needs of the region and the State

a) The need for the advancement and evolution of knowledge

The Bachelor of Science in Industrial Engineering Technology contributes to the advancement and evolution of applied STEM education by integrating engineering technology, quantitative analysis, systems thinking, and operations-focused decision-making within a single, workforce-oriented curriculum. As industrial and service sectors become increasingly complex, employers seek graduates who can analyze, optimize, and improve systems that integrate people, processes, technology, and data rather than focusing solely on narrow technical functions.

The program prepares students to engage with evolving technologies and practices critical to Maryland's economy, including advanced manufacturing systems, quality and process improvement, supply chain and logistics operations, automation, data-driven decision-making, and Industry 4.0 environments. By emphasizing applied problem-solving, systems integration, and analytical methods grounded in real-world industrial contexts, the program supports the continued advancement of knowledge necessary to sustain productivity, innovation, and competitiveness across Maryland's public and private sectors.

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

The program is designed to expand access to applied engineering technology education for a broad and diverse student population, including first-generation college students, working adults, military-affiliated students, and community college transfer students. The Bachelor of Science in Industrial Engineering Technology offers a practical, career-oriented pathway for students who may be discouraged by highly theoretical engineering programs but who are motivated to pursue professional roles in manufacturing, operations, quality, logistics, and systems improvement.

Capitol Technology University has a demonstrated commitment to serving underrepresented and educationally disadvantaged populations in STEM disciplines. The applied nature of the program, combined with small class sizes, individualized academic advising, faculty mentoring, and industry-aligned coursework, supports student retention and degree completion. By emphasizing practical skills, analytical reasoning, and professional readiness, the program expands educational choice and access for

students seeking attainable, workforce-relevant pathways into high-demand technical and operational fields.

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

While Capitol Technology University is not a historically black institution (HBI), it supports the statewide objective of strengthening educational capacity and opportunity for students served by Maryland's HBIs. The Bachelor of Science in Industrial Engineering Technology provides opportunities for collaboration through articulation agreements, transfer pathways, joint academic initiatives, and outreach activities that can complement and enhance HBI offerings in applied STEM, engineering technology, and operations-related disciplines.

The program's applied, systems-oriented structure is well suited to partnership-based pathways that broaden access to interdisciplinary industrial engineering technology education. Through collaboration and coordinated academic initiatives, the program supports the broader State goal of increasing participation, persistence, and success of underrepresented students in applied STEM fields, including those enrolled at or transferring from Maryland's historically black institutions.

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

The Maryland State Plan for Postsecondary Education identifies three primary goals for postsecondary education:

1. Student Access
2. Student Success
3. Innovation

Goal 1: Student Access

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

Capitol Technology University is committed to expanding access to high-quality, workforce-aligned education in industrial engineering technology for students across Maryland. The Bachelor of Science in Industrial Engineering Technology was developed to serve students who may be underserved by traditional engineering pathways, including transfer students, adult learners, first-generation college students, veterans, and underrepresented minorities in STEM.

The program supports access through targeted recruitment at Maryland high schools and community colleges, articulation agreements that facilitate transfer from associate-level engineering technology and industrial technology programs, and the availability of financial aid, institutional scholarships, and military tuition benefits. The applied focus of the curriculum, combined with flexible scheduling options, makes the program accessible to nontraditional and working students. These efforts align with the State Plan's priorities related to affordability, financial planning, and improving systems that support access for diverse student populations.

Goal 2: Student Success

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

The Bachelor of Science in Industrial Engineering Technology is intentionally structured to promote student progression, retention, and timely degree completion. The curriculum emphasizes applied learning, hands-on projects, teamwork, and systems-based problem solving, which strengthen student engagement and practical competence.

Students benefit from individualized academic advising, faculty mentoring, tutoring services, and early alert systems that support academic success. Student success is further reinforced through a two-semester senior design experience that integrates technical knowledge with economic analysis, project management, communication, and professional practice. Opportunities for internships, industry-sponsored projects, and applied research experiences further strengthen workforce readiness and align learning outcomes with employer expectations. These practices support the State Plan’s priorities related to educational quality, reduction of barriers to completion, and promotion of lifelong learning.

Goal 3: Innovation

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

The Bachelor of Science in Industrial Engineering Technology represents an innovative approach to undergraduate STEM education by integrating applied engineering technology, systems analysis, operations management, and emerging industrial technologies within a single interdisciplinary program. The curriculum reflects evolving workforce needs by preparing students to analyze and improve complex systems across manufacturing and service environments rather than within narrowly defined technical silos.

Program innovations include a flexible curriculum structure that can support future certificates or applied specialization options, integration of existing laboratory and instructional resources to maintain quality while minimizing startup costs, and a capstone design sequence grounded in real-world industrial and organizational challenges. These elements align with the State Plan’s priorities related to innovative academic practices, new educational models, and work-based and applied learning experiences.

In summary, the Bachelor of Science in Industrial Engineering Technology aligns closely with all three goals of the Maryland State Plan for Postsecondary Education. The program expands equitable access to applied STEM education, promotes student success through experiential and practice-based learning, and advances innovative curricular approaches that respond directly to Maryland’s current and future workforce needs.

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

1. Description of potential industry or industries, employment opportunities, and expected level of entry for graduates of the proposed program

Graduates of the Bachelor of Science in Industrial Engineering Technology will be prepared for employment in a range of industrial, manufacturing, operations, logistics, and systems-focused roles across Maryland’s technology-driven and production-oriented economy. The program supports entry-level employment opportunities in industries such as advanced manufacturing, quality and process

improvement, supply chain and logistics operations, healthcare and service systems, defense and aerospace support services, infrastructure systems, and technology-enabled operations.

The curriculum is intentionally designed to align with employer demand for professionals who possess applied engineering technology skills, quantitative analysis capability, and systems-level understanding of industrial operations. Graduates will be prepared for job titles such as industrial engineering technologist, operations analyst, quality engineering technologist, process improvement specialist, manufacturing technologist, supply chain analyst, production planner, and systems or operations coordinator. These positions emphasize applied analysis, process optimization, data-driven decision-making, and operational support rather than theoretical engineering design.

Graduates are expected to enter the workforce at the technologist, analyst, or junior professional level. With experience and continued professional development, graduates may advance into supervisory, operations management, quality leadership, process engineering, or systems improvement roles within manufacturing, logistics, healthcare, government, and service-sector organizations.

2. Data and analysis projecting market demand and the availability of openings in the job market served by the program

Graduates of the Bachelor of Science in Industrial Engineering Technology are prepared for applied industrial and operations-oriented roles aligned with multiple occupational classifications identified by the U.S. Bureau of Labor Statistics (BLS). While “Industrial Engineering Technologist” is not a single, standalone BLS occupation, the competencies developed in this program align closely with categories such as industrial engineering technologists and technicians, operations research analysts, quality control analysts, production planners, and supply chain and logistics specialists.

According to the BLS, employment of industrial engineering technologists and technicians is projected to grow through 2033, driven by continued demand for process optimization, efficiency improvement, automation, and data-supported decision-making in manufacturing and service industries. National median annual wages for industrial engineering technologists exceed $60,000, reflecting sustained employer demand for applied systems and process expertise.

Operations research analysts represent another closely aligned occupation. The BLS projects employment in this field to grow faster than average through 2033, supported by increased reliance on data analytics, optimization, and modeling to improve organizational performance. National median annual wages for operations research analysts exceed $80,000, with strong demand in government, defense, logistics, healthcare, and manufacturing sectors.

In Maryland, demand for industrial engineering technology and operations-focused professionals is particularly strong due to the state’s concentration of defense installations, federal agencies, healthcare systems, advanced manufacturing firms, logistics hubs, and infrastructure modernization initiatives. The Maryland Department of Labor projects continued growth across engineering, architecture, operations, and technical support occupations through 2032, with applied and systems-oriented roles comprising a significant portion of projected job openings.

Maryland also ranks among the leading states for employment in logistics, supply chain, and manufacturing-related occupations, all of which align closely with the applied, systems-based preparation provided by the Industrial Engineering Technology curriculum.

3. Evidence from market surveys and workforce projections demonstrating educational and training needs and anticipated vacancies

Market surveys and workforce projections consistently indicate strong demand in Maryland for applied professionals who combine engineering technology knowledge with quantitative analysis, systems thinking, and practical implementation skills. According to the Maryland Department of Labor's Occupational Projections for 2022–2032, employment in architecture, engineering, operations, and related technical occupations is projected to grow statewide, generating thousands of new and replacement job openings over the next decade.

The Georgetown University Center on Education and the Workforce, in its "Projections Through 2031" report, indicates that nearly 70 percent of jobs in Maryland will require postsecondary education or training. The report further highlights increasing demand for applied, bachelor's-level occupations that emphasize analytical reasoning, problem-solving, and operational competence rather than purely theoretical preparation. These findings align directly with the educational objectives of the Industrial Engineering Technology program.

The Maryland Statewide Workforce Development Plan (2024–2028) identifies advanced manufacturing, logistics and supply chain, healthcare systems, infrastructure, and defense-related industries as priority sectors. The plan emphasizes the need for employer-aligned academic programs that integrate applied learning, data analysis, systems optimization, and continuous improvement methods to address workforce shortages.

Real-time labor market data from sources such as Lightcast, Indeed, and LinkedIn further support demand in Maryland for roles such as process improvement analyst, quality specialist, manufacturing technologist, operations analyst, and supply chain coordinator. Job postings for these roles frequently specify bachelor's-level preparation with applied engineering, analytics, or operations-focused skills.

4. Data showing the current and projected supply of prospective graduates

The current supply of graduates from applied industrial engineering technology and operations-focused bachelor's programs in Maryland is limited. Most existing programs fall into one of two categories: traditional industrial engineering programs with a strong theoretical and mathematical emphasis, or engineering technology programs oriented toward technician-level preparation. Few programs offer a bachelor's-level pathway that integrates applied engineering technology, quantitative analysis, systems optimization, and operational practice.

IPEDS data indicate that Maryland institutions award bachelor's degrees annually in traditional engineering disciplines, including industrial engineering. However, these programs typically emphasize theoretical modeling and design rather than applied industrial systems, operational integration, and process improvement skills sought by many employers.

The Bachelor of Science in Industrial Engineering Technology addresses this gap by providing a practice-oriented, bachelor's-level program that integrates engineering technology, operations research methods, quality systems, manufacturing processes, and professional practice. The program is not positioned as a licensure-track engineering degree, allowing it to serve workforce needs that are not fully addressed by existing engineering or technician-focused programs.

Based on institutional planning and enrollment projections:

- The program is expected to enroll approximately 15 to 20 students in its first year
- Enrollment is projected to grow to approximately 60 to 75 students by year five
- The program anticipates graduating approximately 12 to 18 students annually by year five, assuming typical retention and completion rates

These graduates will contribute directly to meeting Maryland's demand for industrial engineering technologists and operations-focused professionals in sectors such as advanced manufacturing, logistics, healthcare systems, defense support services, and infrastructure operations. The proposed program will therefore help close the gap between workforce demand and the supply of applied, bachelor's-level industrial engineering technology graduates in the State.

D. Reasonableness of Program Duplication

1. Identification of Similar Programs in the State and Discussion of Similarities and Differences

Under CIP classifications related to Industrial Engineering (14.3501) and Engineering Technology (15.0612 and related fields), the following Maryland institutions offer bachelor's-level programs that are related in discipline or content area to the proposed Bachelor of Science in Industrial Engineering Technology:

Industrial Engineering (Engineering-Oriented Programs)

• **University of Maryland, College Park** – *Bachelor of Science in Industrial Engineering*
• **Morgan State University** – *Bachelor of Science in Industrial Engineering*

These programs are traditional engineering degrees that emphasize advanced mathematics, engineering science, theoretical modeling, optimization, and preparation for professional engineering licensure. Their curricular structures align with Engineering Accreditation Commission (EAC) standards and are oriented toward theoretical design and analytical modeling.

Engineering Technology and Related Applied Programs

• **University of Maryland Eastern Shore** – *Bachelor of Science in Engineering Technology*
• **Stevenson University** – *Bachelor of Science in Engineering Technology*
• **Towson University** – *Bachelor of Science in Technology Management*

While these programs incorporate applied and technology-focused instruction, they are not specifically structured as Industrial Engineering Technology degrees with an integrated systems and operations emphasis.

Related Engineering Disciplines Offered in Maryland

Several Maryland institutions offer broader engineering programs that may include coursework related to industrial systems or operations analysis:

• **University of Maryland, Baltimore County** – *Bachelor of Science in Mechanical Engineering*
• **Johns Hopkins University** – *Bachelor of Science in Mechanical Engineering*
• **University of Maryland, College Park** – *Bachelor of Science in Mechanical Engineering*

These programs may include operations research or systems engineering components within broader engineering curricula but are not dedicated Industrial Engineering Technology programs.

Associate-Level and Transfer Programs

Multiple Maryland community colleges offer associate-level engineering or engineering technology programs intended primarily for transfer:

• Anne Arundel Community College – *Engineering (Associate of Science)*
• Montgomery College – *Engineering (Associate of Science)*
• Prince George's Community College – *Engineering (Associate of Science)*
• Community College of Baltimore County – *Engineering (Associate of Science)*

These programs do not offer bachelor's-level industrial engineering technology degrees and are structured primarily as transfer pathways.

Similarities

The proposed Bachelor of Science in Industrial Engineering Technology shares certain common elements with the programs identified above, including:

• Exposure to engineering-related quantitative analysis
• Focus on improving efficiency, productivity, and system performance
• Preparation for employment in technical, manufacturing, logistics, and operations-related environments

Key Differences

Program Orientation and Academic Focus

The Bachelor of Science in Industrial Engineering programs at the University of Maryland, College Park and Morgan State University emphasize theoretical modeling, advanced mathematics, engineering design, and licensure-track preparation.

In contrast, the proposed Bachelor of Science in Industrial Engineering Technology emphasizes applied engineering principles, practical systems analysis, and implementation-focused problem solving. The curriculum prioritizes hands-on application, operational improvement, and real-world decision-making over abstract theoretical development.

Applied Systems and Operations Emphasis

The proposed program integrates manufacturing systems, quality control and statistical process control, work measurement and methods, applied operations research, supply chain operations, and systems engineering within a cohesive, application-driven curriculum. This systems-oriented, implementation-focused structure distinguishes the program from traditional engineering programs and from broader engineering technology degrees that do not center specifically on industrial systems optimization.

Target Student Population

The Bachelor of Science in Industrial Engineering Technology is designed to serve transfer students, working professionals, adult learners, and military-affiliated students seeking applied, workforce-oriented pathways. Many traditional industrial engineering programs primarily serve full-time, traditional undergraduate populations and are structured toward theoretical engineering preparation.

Learning Environment and Pedagogy

The proposed program emphasizes applied coursework, project-based instruction, laboratory-supported learning where appropriate, and a two-semester senior design sequence focused on industrial and operational problem solving. This applied instructional model differs from lecture-intensive theoretical engineering curricula and from associate-level technician programs that do not integrate systems-level analysis at the bachelor's level.

Institutional Context

Capitol Technology University's mission centers on career-ready education in engineering, technology, and applied sciences. The proposed Industrial Engineering Technology program leverages institutional strengths in engineering technology, systems engineering, computing, and applied STEM education to deliver a program that bridges engineering concepts and operational implementation.

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

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

The proposed Bachelor of Science in Industrial Engineering Technology is designed to complement—rather than compete with or diminish—high-demand programs currently offered by Maryland's Historically Black Institutions (HBIs). Institutions such as Morgan State University and the University of Maryland Eastern Shore offer established programs in engineering, engineering technology, and applied STEM disciplines that play a vital role in expanding educational access and workforce readiness for underrepresented students across the State.

The Industrial Engineering Technology program differs from existing HBI offerings in both curricular emphasis and target student population. The proposed program emphasizes applied industrial systems, operations analysis, manufacturing processes, quality improvement, and data-driven decision-making rather than traditional engineering theory or licensure-oriented preparation. It is specifically structured to serve students seeking practice-oriented, workforce-aligned education for roles in manufacturing, operations, logistics, quality, and systems improvement. The program also targets nontraditional learners, community college transfer students, military-affiliated students, and working professionals—populations that may not otherwise pursue or complete traditional engineering programs.

Rather than diverting students from high-demand HBI programs, the Bachelor of Science in Industrial Engineering Technology has the potential to support and strengthen statewide STEM capacity in several ways:

• By providing additional transfer and degree-completion pathways for students from HBIs or HBI-affiliated community colleges who seek a more applied, systems-oriented bachelor's-level option aligned with workforce entry or career advancement.

• By enabling opportunities for inter-institutional collaboration on applied projects, workforce development initiatives, and industry-aligned programming in areas such as advanced manufacturing, supply chain operations, quality systems, healthcare operations, and infrastructure management.

• By expanding Maryland's capacity to meet employer demand for applied industrial engineering technologists and operations-focused professionals without duplicating the theoretical, discipline-specific engineering focus central to many HBI programs.

The introduction of the Bachelor of Science in Industrial Engineering Technology will not reduce enrollment or compromise the sustainability of high-demand programs at HBIs. Instead, it contributes to a complementary statewide ecosystem of STEM education by offering an applied, workforce-responsive pathway that aligns with state equity goals, preserves institutional missions, and broadens access to high-quality industrial and operations-focused education.

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

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

The proposed Bachelor of Science in Industrial Engineering Technology is not expected to negatively impact the uniqueness, missions, or institutional identities of Maryland's Historically Black Institutions (HBIs). Rather, the program complements statewide efforts to expand access to high-quality, workforce-aligned STEM education—an objective that is closely aligned with the missions and priorities of HBIs.

Maryland's HBIs, including Morgan State University, Bowie State University, Coppin State University, and the University of Maryland Eastern Shore, play a critical role in educating underrepresented students and advancing equity in higher education. Their institutional missions emphasize academic excellence, leadership development, community engagement, and increasing participation of African American students in high-demand fields such as engineering, technology, computing, and applied sciences.

The Bachelor of Science in Industrial Engineering Technology differs from existing HBI offerings in both program design and target population. The proposed program emphasizes applied industrial systems, operations analysis, manufacturing processes, quality improvement, and data-driven decision-making rather than traditional engineering theory or licensure-oriented preparation. It is designed to serve transfer students, adult learners, working professionals, and students seeking applied, workforce-ready preparation for roles in manufacturing, operations, logistics, healthcare systems, and service industries.

Rather than duplicating or competing with HBI programs, the Industrial Engineering Technology program fills a distinct niche within Maryland's higher education ecosystem. It offers opportunities for collaboration through articulation pathways, degree-completion options, workforce development initiatives, applied project partnerships, and shared engagement with industry employers. These collaborative efforts can enhance statewide capacity to prepare students for applied industrial and operations-focused roles while preserving the distinctive academic missions of HBIs.

By expanding access to applied industrial engineering technology education and supporting workforce-aligned pathways, the Bachelor of Science in Industrial Engineering Technology reinforces Maryland's collective commitment to equity, access, and economic opportunity. The program respects and supports the unique identities and missions of HBIs while advancing shared statewide goals related to STEM participation, applied learning, and workforce preparation.

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

1. Description of how the proposed program was established and the faculty who will oversee the program

The Bachelor of Science in Industrial Engineering Technology was developed through a collaborative academic planning process involving faculty from Capitol Technology University's Engineering Department, the Office of Academic Affairs, and institutional leadership, with input informed by workforce needs and industry trends. The program was created in response to regional and statewide demand for graduates with applied industrial engineering skills, systems-level understanding, and professional readiness in manufacturing, operations, logistics, quality, and service environments.

The program builds upon existing institutional strengths in engineering technology, systems engineering, operations, computing, and applied STEM education. Approved courses currently offered by the university were intentionally organized into a coherent curriculum that emphasizes applied analysis, systems optimization, data-driven decision-making, and real-world problem solving. The curriculum is structured to support both first-time undergraduate students and transfer students from community colleges and applied technology programs, while maintaining appropriate rigor for a bachelor's-level degree.

The program will be overseen by full-time faculty with expertise in industrial engineering technology, manufacturing systems, operations research, systems engineering, quality engineering, and related technical disciplines. These faculty members hold appropriate academic credentials and bring a combination of academic and industry experience aligned with the applied focus of the program. Adjunct faculty and professors of practice with specialized expertise in areas such as supply chain operations, manufacturing systems, automation, and project management will support instruction and senior design projects as needed.

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

The Bachelor of Science in Industrial Engineering Technology is delivered primarily in an on-campus, face-to-face modality, with selected courses offered in hybrid or online formats to support transfer students and working professionals. The curriculum emphasizes applied instruction supported by quantitative analysis, case-based learning, laboratory-supported coursework where appropriate, team-based projects, and a two-semester senior design experience.

Educational Objectives
Graduates of the Industrial Engineering Technology program will:

1. Be prepared for entry-level and early-career employment in industrial engineering technology, manufacturing, operations, quality, logistics, and systems improvement roles.
2. Apply applied engineering and analytical principles to improve productivity, quality, efficiency, and decision-making in industrial and service systems.
3. Demonstrate professional communication, ethical responsibility, teamwork, and project management skills in technical and operational environments.
4. Engage in lifelong learning, professional development, certification, or continued education in industrial engineering technology and related fields.

Learning Outcomes
Upon graduation, students will be able to:

1. Apply applied engineering technology, quantitative methods, and systems concepts to analyze and solve industrial and operational problems.
2. Design, implement, and evaluate process improvements and system solutions that meet defined technical, economic, and operational requirements.
3. Communicate effectively with technical and non-technical audiences through written, oral, and graphical formats.
4. Recognize ethical, professional, safety, and societal responsibilities in industrial engineering technology contexts and make informed decisions.
5. Function effectively as a member of a multidisciplinary technical team by contributing to planning, coordination, and execution of tasks.
6. Collect, analyze, and interpret data using appropriate statistical and analytical tools to evaluate system performance and support decision-making.
7. Acquire and apply new technical knowledge using appropriate learning strategies, professional resources, and industry-relevant tools.

These learning outcomes reflect the rigor and breadth appropriate for a bachelor's-level industrial engineering technology program and emphasize applied competence, workforce readiness, and professional practice.

3. Explanation of how the institution will provide for assessment and documentation of student learning outcomes

a) Assessment of student achievement of learning outcomes

Assessment of student learning outcomes will be conducted using a combination of direct and indirect measures. Each course includes clearly defined learning outcomes mapped to the program-level outcomes. Faculty assess student achievement through exams, applied problem sets, laboratory activities, case studies, projects, presentations, and team-based assignments.

The two-semester senior design sequence serves as the culminating assessment experience, evaluating students' ability to integrate industrial engineering technology knowledge, apply analytical and systems

thinking, manage projects, and communicate results. Assessment data are reviewed annually by program faculty and the Dean of Engineering and Technology, with input from advisory board members as appropriate, to support continuous program improvement.

b) Documentation of student achievement of learning outcomes

Capitol Technology University maintains a centralized and systematic process for documenting student learning outcomes and program-level assessment results. Course portfolios include syllabi, assignments, rubrics, and representative samples of student work. Faculty submit annual assessment summaries documenting outcome achievement, identifying areas for improvement, and recommending curricular or instructional adjustments.

These materials are reviewed through established internal academic assessment processes and are retained to support institutional effectiveness, accreditation, and regulatory reporting requirements.

4. List of courses, program requirements, and curriculum structure

The Bachelor of Science in Industrial Engineering Technology is a **120-credit** undergraduate degree designed to prepare students for immediate workforce entry and long-term career advancement in industrial and operations-focused fields. The program integrates mathematics and science foundations, engineering and computing competencies, specialized industrial engineering technology coursework, and general education to support professional effectiveness and ethical responsibility.

Students complete a structured sequence of core industrial engineering technology courses and a two-semester senior design experience that demonstrates integration of applied knowledge, analytical skills, and professional practice.

Curriculum Distribution

Category	Description	Credits
General Education	Courses designed to develop written and oral communication skills, ethical reasoning, critical thinking, and professional awareness in social, cultural, and business contexts.	21
Mathematics and Science	Foundational mathematics and science coursework providing quantitative, analytical, and scientific principles necessary for engineering technology practice, including calculus, statistics, physics, and chemistry.	34
Engineering and Computing Core	Core engineering and computing courses that introduce electrical, digital, computational, systems, and design concepts supporting modern industrial and cyber-physical systems.	27
Industrial Engineering Technology Core	Specialized coursework focused on applied industrial engineering technology methods, including manufacturing systems, quality, operations research, supply chain management, and operations management.	24
Operations and Emerging Technologies	Courses addressing systems integration, robotics, operational technology, and Industry 4.0 concepts relevant to contemporary industrial environments.	6

Senior Design (Capstone)	A two-course capstone sequence requiring students to apply accumulated knowledge and skills to a comprehensive engineering technology design project.	6
General Electives	Elective coursework allowing students to broaden or deepen technical or interdisciplinary knowledge consistent with program objectives.	6
Total		**120**

The curriculum is structured to provide students with applied technical depth, interdisciplinary breadth, and professional skills necessary for success in modern industrial and technology-driven environments. The Bachelor of Science in Industrial Engineering Technology emphasizes strong quantitative foundations, applied engineering technology methods, systems thinking, and workforce readiness. The program integrates hands-on learning, analytical problem solving, and professional practice to prepare graduates for industrial, operations, and systems-oriented roles while maintaining curricular coherence and flexibility appropriate for a bachelor's-level engineering technology degree.

Bachelor of Science (B.S.) in Industrial Engineering Technology
Total Credits: 120

I. General Education (21 Credits)

Course Number	Course Title	Credits
EN 101	English Communications I	3
EN 102	English Communications II	3
HU 331	Arts and Ideas	3
SS 351	Ethics	3
BUS 174	Introduction to Business and Management	3
BUS 301	Project Management	3
HU/SS Elective	Humanities/Social Science Elective	3
Subtotal		**21**

II. Mathematics and Science (34 Credits)

Course Number	Course Title	Credits
MA 112	Intermediate Algebra	3
MA 114	Algebra and Trigonometry	4
MA 128	Introduction to Statistics	3
MA 261	Calculus I	4
MA 262	Calculus II	4
PH 201	General Physics I	3
PH 202	General Physics II	3
CH 120	Chemistry	3
MA 345	Probability and Statistics for Engineers	3
Subtotal		**34**

III. Engineering and Computing Core (27 Credits)

Course Number	Course Title	Credits
EL 100	Introduction to DC/AC Circuits	3
EL 200	Electronic Devices and Circuits	3
EL 204	Digital Electronics	3
CS 120	Introduction to Programming Using Python	3
IAE 201	Introduction to Information Assurance Concepts	3
AIT 201	Introduction to Artificial Intelligence	3
EE 362	Microcontroller System Design	3
MEC 215	Introduction to Engineering Design CAD	3
EE 340	Systems Engineering	3
Subtotal		**27**

IV. Industrial Engineering Technology Core (24 Credits)

Course Number	Course Title	Credits
MEC 155	Introduction to Materials Science	3
IET 220	Engineering Economics and Cost Analysis	3
IET 230	Work Measurement and Methods Engineering	3
IET 240	Quality Control and Statistical Process Control	3
IET 250	Manufacturing Processes and Systems	3
IET 310	Operations Research and Optimization	3
OPS 254	Supply Chain Operations Management	3
OPS 101	Introduction to Operations Management	3
Subtotal		**24**

V. Operations and Emerging Technologies (6 Credits)

Course Number	Course Title	Credits
OPS 290	Operational Technology and Industry 4.0	3
ROB 100	Introduction to Robotics	3
Subtotal		**6**

VI. Senior Design (Capstone) (6 Credits)

Course Number	Course Title	Credits
SDE 457	Senior Design I	3
SDE 458	Senior Design II	3
Subtotal		**6**

VII. General Electives (2 courses, 6 Credits)

Course Number	Course Title	Credits
General Elective	Approved General Elective	3
General Elective	Approved General Elective	3
Subtotal		**6**

Course Descriptions

I. General Education (21 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

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 101

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

HU/SS Elective – Humanities or Social Science Elective (3 credits): This elective allows students to select a course in the humanities or social sciences that supports the development of critical thinking, cultural awareness, ethical reasoning, and social responsibility. Approved courses broaden students' understanding of human behavior, societal structures, and global perspectives, complementing the technical focus of the degree program.

II. Mathematics and Science (34 Credits)

MA 112 – Intermediate Algebra (3 credits): Designed for students needing mathematical skills and concepts for MA-114 and MA-261. In this course students are introduced to equations and inequalities and learn the language of algebra and related functions, including polynomial, rational, exponential and logarithmic functions. Other topics include solving equations, inequalities and systems of linear equations; performing operations with real numbers, complex numbers and functions; constructing and analyzing graphs of functions; and using mathematical modeling to solve application problems. **Prerequisite(s):** MA 005 or placement test score.

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 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(s): MA 110, MA 111 or MA 112.

MA 261 - Calculus I (4 credits): This course covers lines, circles, ellipses; functions and limits, differentiation, power rule, higher-order derivatives, product, quotient and chain rules, implicit differentiation, and applications. Regarding integration, it addresses definite integrals; indeterminate forms; exponential, logarithmic, trigonometric and hyperbolic functions; differentiation and integration, and graphing. Prerequisite(s): MA 114

MA 262 - Calculus II (4 credits): This course centers on methods of integration, including completing the square, substitution, partial fractions, integration by parts, trigonometric integrals, power series, and parametric equations. It also addresses partial derivatives, directional derivatives, and an introduction to multiple integrals. Prerequisite(s): MA 261

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

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

MA 345 – Probability & Statistics for Engineers (3 credits): This course focuses on sets and methods of counting, as well as probability density functions, expected values, and correlations. Forms of distribution addressed included binomial, Poisson, exponential, and normal. Additional topics covered include the central limit theorem, statistical estimation, an introduction to stochastic processes, and applications to noise and reliability. **Prerequisite(s):** MA 262

III. Engineering and Computing Core (27 Credits)

EL 100 – Introduction to DC/AC Circuits (3 credits): Basic electrical concepts and laboratory techniques. Current, voltage, resistance and power. Ohm's law, series and parallel resistive circuits. Kirchhoff's voltage and current laws. Loading effects on meters and supplies. Capacitors and Inductors. Charging and discharging. RC and RL time constants. Introduction to AC. Sinusoidal waveforms, phasors and use of the J operator. Reactance and admittance. Average values and RMS. Laboratory emphasis is on the proper use of standard meters, testing equipment and circuit breadboarding. MATLAB Part I: Introduction to MATLAB, variables, MATLAB functions, data types, writing a MATLAB program, using basic plotting functions. Corequisite(s): MA 112.

EL-200 – Electronic Devices/Circuits (3 credits): Principles and characteristics of semiconductor devices. Devices covered include diodes, Zener diodes, bipolar junction transistors, field-effect transistors, and operational amplifiers. Includes bias networks, operating points, maximum output and optimum bias, and DC and AC load lines. Input and output impedances, and voltage and current gains for each amplifier configuration. Prerequisite(s): EL 150.

EL-204 – Digital Electronics (3 credits): Number systems, including binary, octal and hexadecimal bases. Binary arithmetic. Boolean algebra, Karnaugh map simplification. Design of combinational circuits. Decoders, multiplexers, flip-flops and other multi-vibrator circuits. Logic families including TTL, CMOS, ECL and others. Memory, shift registers and counters. Prerequisite(s): None

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.

AE 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. **Prerequisite(s):** MA 110 or MA 112 or MA 114 or MA 261

AIT 201 – Introduction to Artificial Intelligence (3 credits): Introduction to Artificial Intelligence explores the foundational principles and applications of AI. Students delve into key concepts such as machine learning, data representation, and problemsolving algorithms. The course introduces ethical considerations in AI development and its societal impact. Exploring various types of AI, from rule-based systems to machine learning approaches, students gain insights into the breadth of AI applications. Hands-on projects provide practical experience in implementing AI techniques. This course equips students with a broad understanding of AI's capabilities and challenges, laying the groundwork for advanced studies and real-world applications. **Prerequisite(s):** MA 128**EE 362 – Microcontroller System Design (3 credits):** Study of a state of the art microcontroller and related families. Evaluation board hardware preparation and checkout. PC to board interfaces. Assembler and C-compiler. Configuration registers for code and program protection. On-chip memories. Serial peripheral interface and parallel I/O routines. A/D converter, real-time interrupts and timer applications. A series of three group projects are required leading up to a final stand-alone project. **Prerequisite(s):** EL 204

MEC 215 - Introduction to Engineering Design Computer-Aided Design (3 credits): Introduction to computer-aided design (CAD) for product design, modeling, and prototyping. Individual use and team-based environment to design and prototype a functional and manufacturable marketable product. Application to design, manufacturing, and analysis using geometric tolerancing and dimensioning.

EE 340 – Systems Engineering (3 credits): This course introduces the principles and practices of systems engineering, focusing on the design, management, and improvement of complex engineering systems. Students will learn systems lifecycle planning, project management, quality control, and risk analysis, with an emphasis on integrating safety and compliance with engineering standards. Topics include system modeling, production systems planning, and human factors, preparing students to tackle multifaceted projects. Designed for engineering students across disciplines, the course equips participants with the technical and managerial skills needed to develop safe, efficient, and sustainable systems in diverse engineering fields

.IV. Industrial Engineering Technology Core (24 Credits)

MEC 155 - Introduction to Materials Science (3 credits): Origin and behavior of materials. Classifications of materials. Physical metallurgy-mechanical and physical properties, crystalline structure, imperfections in solids, phase diagrams, failure mechanisms in materials, hardening and tempering, isothermal diagrams. Involves hands-on experiences through lab sessions in the use of metallurgical and mechanical testing equipment.

IET 220 – Engineering Economics & Cost Analysis (3 credits): This course introduces economic principles and cost analysis techniques used in engineering and industrial decision-making. Topics include cost estimation, time value of money, cash flow analysis, present and annual worth methods, rate of return, break-even analysis, and economic evaluation of alternatives. **Prerequisite(s):** MA 128

IET 230 – Work Measurement & Methods Engineering (3 credits): This course focuses on the analysis and improvement of work methods and labor productivity in industrial systems. Topics include work measurement, time study, work sampling, standard time development, methods analysis, process improvement, and job design. Human factors and ergonomics considerations are integrated to support efficient, safe, and effective work systems. **Prerequisite(s):** None

IET 240 – Quality Control & Statistical Process Control (3 credits): This course covers principles and tools used to monitor, control, and improve quality in manufacturing and service systems. Topics include quality planning, control charts, process capability analysis, acceptance sampling, and continuous improvement techniques. Students apply statistical methods to analyze process variation and support data-driven quality improvement. **Prerequisite(s):** MA 128

IET 250 – Manufacturing Processes & Systems (3 credits): This course provides an overview of modern manufacturing processes and integrated production systems. Topics include material processing methods, forming and machining processes, assembly operations, automation, and production planning. Emphasis is placed on understanding how manufacturing systems are designed, operated, and improved to achieve quality, cost, and productivity objectives. **Prerequisite(s):** None

IET 310 – Operations Research & Optimization (3 credits): This course introduces analytical and optimization techniques used to support decision-making in industrial systems. Topics include linear programming, optimization models, network analysis, inventory models, queuing systems, and decision analysis. Students learn to formulate and solve operations research problems with applications to production, scheduling, logistics, and resource allocation. **Prerequisite(s):** MA 261

OPS 254 -- Supply Chain Operations Management (3 credits): This course covers supply chain strategy, design, and management. Topics include procurement, supplier management, logistics, inventory optimization, and supply chain collaboration. Students examine how technology enables supply chain visibility, coordination, and efficiency. Real-world case studies illustrate supply chain challenges and solutions across industries. Prerequisite(s): None.

OPS 101 -- Introduction to Operations Management (3 credits): This course provides an overview of operations management principles, methods, and practices. Topics include operations strategy, process design, capacity planning, forecasting, inventory management, quality management, and continuous improvement methods including Lean and Six Sigma. The course emphasizes how operations management drives organizational competitiveness and customer satisfaction. Real-world case studies illustrate applications across manufacturing, services, and technology sectors. Prerequisite(s): None.

V. Operations and Emerging Technologies (6 Credits)

OPS 290 -- Operational Technology and Industry 4.0 (3 credits): This course examines the intersection of operational technology with digital transformation and Industry 4.0 principles. Topics include IoT (Internet of Things), automation systems, advanced manufacturing, artificial intelligence applications in

operations, robotics, and data-driven decision-making. Students explore how emerging technologies reshape operational models and organizational strategy. Prerequisite(s): None.

ROB 100 – Introduction to Robotics (3 credits): This course introduces students to the fundamental concepts of robotics, including robot components, basic motion principles, and introductory programming. Students will explore the applications of robotics in various industries while developing hands-on skills through building and programming simple robots. The course emphasizes practical problem-solving, teamwork, and creativity, laying the foundation for advanced robotics courses.

VI. Senior Design (Capstone) (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. 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. Prerequisite(s): SDE 457

VII. General Electives (2 courses, 6 Credits)

General Electives (6 credits): General elective courses allow students to select approved coursework that broadens or deepens their academic experience in areas consistent with the objectives of the degree program. Electives may be used to explore additional technical topics, interdisciplinary studies, or complementary subjects that support students' professional interests and career goals. Courses are selected in consultation with an academic advisor to ensure relevance and appropriate academic level.

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

The Bachelor of Science in Applied Technology fully satisfies the general education requirements as defined by the Maryland Higher Education Commission (MHEC) and the standards outlined in COMAR 13B.02.03. General education is intentionally embedded throughout the curriculum to ensure that students develop critical thinking, effective communication, ethical reasoning, and an understanding of social and civic responsibility.

The program includes 21 credits of general education coursework, consisting of English composition (EN 101 and EN 102), humanities and critical thinking (HU 220, HU 225, HU 331), and social and behavioral sciences (SS 171 and SS 351). These courses support written and oral communication skills,

ethical awareness, analytical reasoning, and an understanding of human and societal factors relevant to applied technology practice.

Quantitative reasoning and scientific literacy are addressed through required coursework in algebra and trigonometry, applied calculus, statistics, chemistry, physics, and data science. Collectively, these requirements ensure that students graduate with a broad intellectual foundation that supports informed decision-making, professional responsibility, and effective participation in technology-driven environments.

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

The Bachelor of Science in Applied Technology is not designed as a licensure-track engineering program and does not seek specialized programmatic accreditation through engineering accrediting bodies. The program is intentionally structured as an applied, interdisciplinary technology degree focused on workforce preparation rather than professional engineering licensure.

The program adheres to all institutional and state requirements governing undergraduate degree programs and is subject to Capitol Technology University's internal academic review, assessment, and continuous improvement processes. Program quality is maintained through curriculum oversight, faculty qualifications, industry advisory input, and alignment with regional workforce needs.
While the degree itself does not confer eligibility for professional licensure, coursework within the program may support industry-recognized certifications depending on the student's chosen concentration. These may include certifications in areas such as information technology, networking, cybersecurity, automation, project management, or data analytics. Preparation for such certifications is embedded where appropriate within relevant courses but is not required for degree completion.

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 another institution or non-collegiate organization. All instruction, curriculum development, academic oversight, and student support services for the Bachelor of Science in Applied Technology will be provided directly by Capitol Technology University using its existing faculty, facilities, and administrative resources.

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

Capitol Technology University affirms that students enrolled in the Bachelor of Science in Applied Technology will be provided with clear, complete, and timely information regarding all aspects of the program. This includes curriculum structure, course and degree requirements, faculty interaction, technology expectations, academic support services, and financial policies.
Information will be communicated through the following mechanisms:

- The program curriculum, course descriptions, credit requirements, and degree expectations will be published in the university academic catalog and maintained on the program webpage. These

materials are reviewed and updated regularly to ensure accuracy and compliance with institutional and state requirements.

- Each student is assigned an academic advisor upon enrollment to support degree planning, course sequencing, prerequisite tracking, and timely progress toward graduation.
- Course syllabi provide clear expectations regarding faculty availability, communication methods, instructional format, and assessment. Faculty-student interaction occurs through lectures, laboratory activities, advising sessions, office hours, and capstone project mentoring.
- Students are informed of assumptions related to computer literacy and required software skills. Any required technical equipment, such as laptops or specialized software, is communicated in advance, with minimum hardware and software specifications published by the Office of Information Technology.
- Canvas serves as the university's official learning management system and is used to deliver course materials, manage assignments, facilitate communication, and provide feedback. Training and technical support are available to students throughout the program.

- Academic support services, including tutoring, library resources, writing assistance, and career development services, are available and described in the student handbook, academic catalog, and university website.

- Information regarding tuition, fees, billing procedures, payment plans, and financial aid is provided by the Business Office and Financial Aid Office, including guidance on scholarships, federal aid, military benefits, and institutional funding options.

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

Capitol Technology University affirms that all advertising, recruiting, and admissions materials related to the Bachelor of Science in Applied Technology will clearly and accurately represent the program, its curriculum, intended outcomes, and the student services available.
The Office of Marketing and Communications works in collaboration with the Office of Admissions and the academic department to ensure that all promotional and recruitment materials are:

- Factually accurate and reflective of the approved curriculum and degree requirements;
- Consistent with the university's mission and commitment to academic integrity;
- Reviewed and updated regularly to reflect program or policy changes.

Recruitment materials—including the university website, digital and print media, social media content, and admissions presentations—will provide transparent information regarding:

- Program objectives, applied focus, and workforce-oriented outcomes;
- Credit requirements, course structure, and instructional modalities;
- Technology and equipment expectations;
- Opportunities for academic advising, academic support, and career services;
- Tuition, fees, and financial aid options.

Admissions counselors and faculty involved in recruitment activities will receive program-specific training to ensure consistent, accurate communication during outreach efforts, recruitment events, and community college transfer engagements.

H. Adequacy of Articulation

1. Discussion of how the program supports articulation with programs at partner institutions

Capitol Technology University maintains multiple articulation and partnership agreements that support student transfer, degree completion, and academic collaboration. These partnerships align closely with the objectives of the proposed Bachelor of Science in Industrial Engineering Technology, which emphasizes applied engineering technology, quantitative analysis, systems thinking, and workforce-aligned preparation.

The program is intentionally designed to be transfer-friendly and will leverage existing articulation agreements with partner institutions such as Cecil College, Notre Dame of Maryland University, Community College of Rhode Island (CCRI), and Columbia Southern University. As articulation agreements are reviewed and updated, the Bachelor of Science in Industrial Engineering Technology will be formally incorporated into the university's portfolio of articulated undergraduate programs where appropriate.

In addition, Capitol Technology University maintains active outreach and collaboration with secondary education partners through initiatives such as Project Lead The Way (PLTW) and participation in the Prince George's County Public Schools (PGCPS) PLTW Engineering Program Advisory Committee. These relationships support early exposure to engineering and industrial technology pathways and facilitate student transitions from secondary education into postsecondary programs aligned with engineering technology and applied STEM disciplines.

Existing and future articulation agreements will be structured to align associate-level coursework in engineering technology, industrial technology, manufacturing, logistics, information technology, and related applied STEM fields with the lower-division requirements of the Industrial Engineering Technology program. The curriculum is organized to maximize the acceptance of transfer credit while preserving the academic rigor, coherence, and learning objectives of the bachelor's degree.

General education, mathematics, science, and foundational technical courses have been mapped to commonly offered coursework at community colleges, military-affiliated institutions, and applied technology programs. This approach enables qualified transfer students to enter the program at the junior level and complete degree requirements efficiently and in a timely manner.

Capitol Technology University will continue to pursue additional articulation agreements with Maryland community colleges and other partner institutions to expand access, strengthen transfer pathways, and support statewide workforce development goals. Formal articulation agreements and transfer pathway documentation will be submitted as supporting materials to this proposal as they are finalized.

I. Adequacy of Faculty Resources

1. Narrative demonstrating the quality of program faculty

The Bachelor of Science in Industrial Engineering Technology is supported by a highly qualified and multidisciplinary faculty team composed of full-time faculty, professors of practice, and adjunct instructors with relevant academic credentials and industry experience. Collectively, program faculty bring expertise in industrial engineering technology, manufacturing systems, operations research, quality

and process improvement, systems engineering, computing, mathematics, physical sciences, and professional practice. This breadth of expertise ensures that students receive a rigorous, applied education aligned with workforce needs and contemporary industrial practice.

The program is administered within the School of Engineering and Technology and benefits from faculty who hold appropriate terminal degrees in engineering, engineering technology, applied sciences, mathematics, and related disciplines. Faculty members have extensive experience teaching applied engineering and technology courses and are actively engaged in laboratory-based instruction, project-based learning, and senior design supervision. Their combined academic and professional backgrounds support the program's emphasis on applied problem solving, quantitative analysis, systems thinking, and professional readiness.

Full-time faculty provide instructional continuity, curriculum oversight, assessment coordination, and academic advising for students in the program. Professors of practice and adjunct faculty contribute specialized expertise in areas such as supply chain operations, manufacturing processes, quality systems, operations management, automation, and emerging industrial technologies. This instructional model allows the program to maintain academic rigor while incorporating current industry practices and perspectives into the curriculum.

Faculty assignments are structured to ensure appropriate coverage of core industrial engineering technology courses, engineering and computing foundations, mathematics and science requirements, and the two-semester senior design sequence. Faculty qualifications, appointment types, academic ranks, and course assignments demonstrate that the institution has sufficient and appropriate instructional resources to support the proposed program at launch and as enrollment grows.

A summary list of faculty members, including appointment type, terminal degree and field, academic title or rank, employment status, and courses taught in the proposed program, is provided below in tabular form as required.

Faculty Resources

Full-Time Faculty

Dr. Andrew Mehri holds a Ph.D. in Computer Science, with additional degrees in information architecture and electronics engineering. He has held leadership roles in technical and vocational education and teaches courses in electronics, digital systems, and applied technical design

Dr. Gregory P. Behrmann holds a Ph.D. in Mechanical Engineering from The Catholic University of America. His background includes federally funded research, micro-manufacturing innovation, and STEM outreach. He teaches applied design, mechanics, and interdisciplinary project courses.

Dr. Jeff Chi holds a Ph.D. in Project Management from the University of Maryland. His professional background includes leadership of large-scale construction, infrastructure, sustainability, and capital management projects. He teaches courses in project management and professional practice.

Dr. Mohamed Ghazy, Dean of Academics and Chair of the Engineering Department, holds a Ph.D. in Engineering from Purdue University. His doctoral research focused on power electronics and electric drive systems. He provides academic leadership for applied and interdisciplinary programs and teaches courses in systems engineering, applied control, mechatronics, energy systems, and senior design.

Dr. Nisma M. Omar holds a Ph.D. in Analytical Chemistry and an M.S. in Physical Chemistry. She teaches foundational science courses supporting applied technology programs and contributes to laboratory instruction and curriculum development

Dr. Tahani Baabdullah is an artificial intelligence and machine learning expert with research and industry experience in deep learning, cybersecurity, and blockchain-integrated AI systems. She holds a Ph.D. in Computer Science and has developed high-accuracy AI models for fraud detection, healthcare, and anomaly detection using Python, TensorFlow, and PyTorch. Her expertise spans neural networks, generative AI, federated learning, and ethical applications of AI across fintech, healthcare, and secure data environments

Prof. Amelia Wear is an Instructor and Lead Systems Engineer at Wabtec. She holds a B.S. in Mechanical Engineering and an M.S. in Software Engineering and brings industry expertise in systems integration, controls, and agile development to instruction in applied systems design and mechatronics

Prof. Jeffrey Volosin, Director of the Astronautical Engineering program, holds a B.S. in Space Sciences and has more than two decades of senior leadership experience at NASA. He teaches systems engineering, applied project management, and interdisciplinary systems courses.

Professors of Practice *(Part-Time)*

Ms. Mary Smikle Peoples is a Professor of Practice in Business and Management with more than 30 years of experience in higher education administration, financial aid leadership, and business operations. Her professional background includes senior administrative roles and applied experience in financial services, program administration, and organizational management.

Adjunct Faculty *(Part-Time)*

Ms. Megan Miskovish 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 writing skills essential for effective leadership in technology operations and management.

Faculty Teaching Assignments Summary

Faculty	Appointment Type	Courses Taught
Dr. Andrew Mehri	Full Time Faculty	IET 220, EL 200, PH 202, SDE 458

Dr. Gregory Behrmann	Full Time Faculty	EE 285, MEC 155, ROB 100, IET 240, IET 250
Dr. Jeff Chi	Full Time Faculty	BUS 174, BUS 301
Dr. Mohamed Ghazy	Full Time Faculty	MA 261, MA 262, PH 201, MA 345
Dr. Nisma Omar	Full Time Faculty	MA 112, MA 114, MA 128, CH 120
Dr. Tahani Baabdullah	Full Time Faculty	CS 120, AIT 201
Prof. Amelia Wear	Full Time Faculty	EL 100, EL 204, EE 362, MEC 215
Prof. Jeff Volosin	Full Time Faculty	EE 340, IET 230, IET 310, SDE 457
Prof. Mary Peoples	(Part-Time) Professor of Practice	OPS 254, OPS 101, OPS 290
Prof. Megan Miskovish	(Part-Time) Adjunct Professor	EN 101, EN 102, HU 331, SS 351

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

Capitol Technology University is committed to continuous faculty development and instructional excellence to ensure high-quality teaching and student success across all academic programs. The university's Center for Innovation in Teaching and Learning (CITL) provides structured and ongoing professional development opportunities focused on evidence-based pedagogical practices, instructional effectiveness, assessment, and the integration of instructional technologies.

a) Pedagogy that meets the needs of students

Faculty teaching in the Bachelor of Science in Industrial Engineering Technology participate in regular professional development activities that emphasize student-centered instruction, inclusive teaching strategies, formative assessment, and active learning methodologies. These training opportunities address the instructional needs of a diverse student population, including traditional undergraduate students, transfer students, adult learners, military-affiliated students, and working professionals.

Emphasis is placed on pedagogical approaches well suited to applied engineering technology education, including project-based learning, case-based instruction, applied problem solving, collaborative team activities, and integration of real-world industrial scenarios. Faculty are supported in designing learning experiences that promote engagement, practical competence, and measurable achievement of program learning outcomes.

b) Learning management system

Canvas is the university's official learning management system and is used consistently across all courses in the program. All faculty receive initial and ongoing training in Canvas through CITL-led workshops, online training modules, and individualized support. Training includes course organization and design, assessment tools, rubric development, learning analytics, accessibility compliance, and effective use of instructional resources to support student learning and engagement.

c) Evidence-based best practices for distance education

The Bachelor of Science in Industrial Engineering Technology is delivered primarily in a face-to-face modality, with selected courses offered in hybrid formats as appropriate to support transfer students and

working professionals. Faculty teaching hybrid courses receive training in evidence-based best practices for blended instruction, including course alignment, student engagement strategies, assessment integrity, and effective use of instructional technologies. All hybrid offerings adhere to institutional policies and established quality standards for instructional delivery.

J. Adequacy of Library Resources

1. Description of library resources available and measures to ensure adequacy in support of the proposed program

Capitol Technology University's Puente Library provides comprehensive academic and research support for students and faculty in the Bachelor of Science in Industrial Engineering Technology program. The library offers a broad range of physical and digital resources that are regularly evaluated and updated to ensure alignment with program learning objectives, curriculum content, and the applied, workforce-oriented focus of the program.

Students enrolled in the Industrial Engineering Technology program have access to an extensive collection of journals, eBooks, reference materials, and technical manuals supporting industrial engineering technology, manufacturing systems, operations research, quality engineering, supply chain management, systems engineering, computing, and applied mathematics. Key electronic resources include databases such as IEEE Xplore, ScienceDirect, SpringerLink, JSTOR, and ProQuest, which provide full-text access to scholarly articles, conference proceedings, and applied research relevant to industrial and operations-focused disciplines.

The Puente Library also maintains access to standards databases, industry publications, and professional reference materials that support applied industrial engineering practice, manufacturing and quality systems, operations management, safety, and systems optimization. Textbooks and supplemental instructional materials supporting both foundational and advanced coursework are available in print and electronic formats to meet the needs of students and faculty.

To ensure the continued adequacy of library resources, academic leadership collaborates closely with library staff to assess program-specific needs and support targeted acquisitions. Faculty teaching in the Industrial Engineering Technology program may submit requests for new books, journals, databases, standards, or instructional resources. These requests are reviewed and prioritized based on curriculum development, enrollment growth, and evolving industry and workforce trends.

Library services include online and in-person research assistance, interlibrary loan, citation management support, and instruction in information literacy. These services ensure that students develop the skills necessary to locate, evaluate, and apply technical, analytical, and scholarly information effectively in both academic and professional contexts.

Capitol Technology University affirms that the Puente Library's collections, services, and acquisition processes are fully adequate to support the launch and sustained operation of the Bachelor of Science in Industrial Engineering Technology program.

Measures to ensure adequate support include:

• Annual review of library holdings to ensure resources remain current and aligned with industrial engineering technology curricula and industry developments.

• Acquisition of additional textbooks, technical manuals, standards, case studies, and reference materials related to manufacturing systems, quality engineering, operations research, supply chain management, and emerging industrial technologies as needed.

• Ongoing collaboration between library staff and Industrial Engineering Technology faculty to identify and acquire academic and industry resources that enhance instruction, applied projects, and senior design activities.

• Continued expansion of access to electronic databases and digital resources to ensure equitable availability for both on-campus and remote learners.

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

1. 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 Industrial Engineering Technology program. The university maintains modern instructional classrooms equipped with multimedia projection systems, wireless connectivity, and collaborative learning technologies that support lecture-based instruction, applied problem solving, and team-oriented learning.

Existing laboratory facilities currently supporting programs in engineering technology, systems engineering, computing, and applied sciences will be utilized to support the Industrial Engineering Technology program. These facilities are sufficient to meet program needs at launch and as enrollment grows.

Laboratory spaces support hands-on instruction and project-based learning in areas including:

• Electrical and electronic systems
• Digital systems and computer-based control
• Automation, control systems, and programmable logic controllers
• Embedded systems, robotics, and cyber-physical systems
• Engineering design, computer-aided design (CAD), and systems integration

Laboratories are equipped with industry-standard instrumentation, prototyping equipment, computing resources, and instructional software such as MATLAB, Multisim, LabVIEW, and related simulation, modeling, and development tools. Safety equipment, procedures, and protocols are in place to support applied laboratory activities and ensure compliance with institutional and regulatory standards.

Faculty and staff offices are available and adequately equipped to support academic advising, student mentoring, curriculum development, assessment activities, and program administration. Space utilization and resource allocation are reviewed regularly to accommodate enrollment growth, instructional needs, and future faculty appointments.

2. Assurance that students and faculty engaged in distance or hybrid education have adequate access to institutional resources

Capitol Technology University ensures that students enrolled in and faculty teaching any hybrid or distance education components of the Industrial Engineering Technology program have full access to the digital infrastructure required for effective instruction, communication, and academic support.

a) Institutional electronic mailing system

All students and faculty are provided with official university email accounts through Microsoft Office 365. These accounts are used for academic communication, course announcements, advising correspondence, and administrative notifications, ensuring consistent, secure, and reliable communication across the institution.

b) Learning management system

Canvas serves as the university's official learning management system and provides the technological support required for hybrid and distance education. Canvas supports both synchronous and asynchronous instructional activities and includes tools for content delivery, assignments, assessments, discussion forums, group collaboration, and multimedia integration. Faculty receive training and ongoing support in effective LMS use and instructional design, while students are provided orientation resources and technical assistance.

Together, Capitol Technology University's physical facilities, laboratory infrastructure, instructional equipment, and digital systems provide a comprehensive and adequate foundation to support both in-person and hybrid instructional delivery for the Bachelor of Science in Industrial Engineering Technology program.

L. Adequacy of Financial Resources with Documentation

1. Table 1: Resources and Narrative Rationale

The Bachelor of Science in Industrial Engineering Technology will be implemented using existing physical facilities, infrastructure, and instructional equipment currently available at Capitol Technology University. The university is well positioned to support the program through existing classrooms, laboratories, faculty offices, and instructional technologies that support engineering technology, operations, computing, and management programs.

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 × 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 × e × f)	$127,596	$242,892	$363,888	$490,800	$623,844
3. Grants, Contracts and Other 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

a. Reallocated Funds
No reallocated funds are required for the Bachelor of Science in Industrial Engineering Technology. The program is designed to leverage existing instructional, administrative, and laboratory resources. No existing programs will be reduced or eliminated to support this initiative.

b. Tuition and Fee Revenue
Tuition and fee revenue projections are based on conservative enrollment growth assumptions, beginning with 8 full-time and 7 part-time students in Year 1 and increasing to 40 full-time and 31 part-time students by Year 5. Tuition rates are based on the university's published rates and assume an average annual increase of approximately 2.5 percent.

Part-time revenue assumes a 12-credit annual load per student. These projections align with Capitol Technology University's strategic emphasis on applied, workforce-oriented engineering technology programs and are sufficient to support instructional staffing, academic support services, and program operations.

c. Grants, Contracts, and External Sources
No external funding is included in the initial financial model. The university may pursue workforce development grants, applied STEM education grants, and industry partnerships in later years to support curriculum enhancement, applied projects, internships, and student scholarships.

d. Other Sources
No additional funding sources are anticipated at launch. Future opportunities may include philanthropic support, employer-sponsored initiatives, or state innovation programs.

2. Table 2: Program Expenditures and Narrative Rationale

TABLE 2: EXPENDITURES

Expenditure Category	Year 1	Year 2	Year 3	Year 4	Year 5
1. Faculty (b + c)	$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. Administrative Staff (b + c)	$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)	$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	$9,980	$15,346	$20,973	$26,872	$33,052
4. Technical Support and Equipment	$840	$1,425	$2,320	$3,145	$4,140
5. Library	$0	$0	$0	$0	$0

6. New or Renovated Space	$0	$0	$0	$0	$0
7. Other Expenses	$5,850	$14,210	$25,370	$39,330	$56,090
TOTAL (Add 1–7)	**$185,985**	**$268,873**	**$398,192**	**$535,948**	**$682,588**

Narrative Rationale for Table 2: Program Expenditures

1. **Faculty** costs include salaries and benefits (estimated at 20 percent) for instructors teaching industrial engineering technology, operations, computing, management, and senior design courses. Faculty staffing increases from 1.5 FTE in Year 1 to 5 FTE by Year 5, reflecting enrollment growth and expanded course offerings. Instruction is delivered through a combination of full-time faculty and adjunct instructors.
2. **Administrative Staff** includes a fractional allocation (0.08 FTE) to support advising coordination, scheduling, reporting, and student services. Costs reflect standard institutional rates with modest annual adjustments.
3. **Support Staff** includes laboratory coordinators, technical assistants, and instructional support personnel required for hands-on labs and applied projects. Staffing increases from 1 FTE to 3 FTE by Year 5 to support expanded laboratory utilization and enrollment growth.
4. **Technical Support and Equipment** costs include software licenses, equipment maintenance, consumable materials, and instructional technology. Increases reflect greater student usage and expanded laboratory activity.
5. **Library** expenditures are not required, as the program relies on existing digital and physical library resources supporting industrial engineering technology, operations, computing, and management.
6. **New or Renovated Space** is not required. Existing classrooms and laboratories are sufficient to support the program.
7. **Other Expenses** include marketing, faculty development, program assessment, and continuous improvement activities that scale with enrollment growth.

Total expenditures increase from $185,985 in Year 1 to $682,588 in Year 5. Tuition and fee revenue substantially exceed expenditures by Year 2, demonstrating that the Bachelor of Science in Industrial Engineering Technology is financially sustainable and can be delivered without reliance on reallocated or external funding.

M. Adequacy of Provisions for Evaluation of Program

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

Capitol Technology University has established comprehensive institutional processes for evaluating the quality and effectiveness of all academic programs, including the Bachelor of Science in Applied Technology. Courses are evaluated at the conclusion of each semester through standardized student course evaluations that assess instructional effectiveness, course organization, learning resources, and perceived achievement of learning outcomes.

Faculty performance is evaluated using multiple measures, including student feedback, peer observations, course portfolio reviews, and annual performance evaluations conducted by the department chair and the Dean of Academic Affairs. These evaluations emphasize instructional quality, student engagement, alignment with course and program learning outcomes, and contributions to curriculum development and continuous improvement.

Student learning outcomes are assessed at both the course and program levels. Faculty teaching courses mapped to specific program outcomes collect assessment data using exams, applied projects, laboratory exercises, presentations, and capstone deliverables supported by standardized rubrics. Assessment results are reviewed during departmental meetings and scheduled program review cycles to identify strengths, address gaps, and guide continuous improvement of curriculum design, instructional methods, and assessment practices.

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

The educational effectiveness of the Bachelor of Science in Applied Technology will be evaluated using a combination of quantitative and qualitative measures aligned with Capitol Technology University's institutional assessment framework. Key evaluation components include the following:

Assessment of Student Learning Outcomes
The program maintains a systematic process for mapping, measuring, and reviewing student learning outcomes related to applied technical knowledge, problem-solving, teamwork, communication, ethical responsibility, and lifelong learning. Data from embedded course assessments, laboratory activities, and the two-course capstone sequence are collected each semester and analyzed annually to inform curricular refinement and instructional improvement.

Student Retention and Graduation Rates
Program-level retention, progression, and graduation data are monitored to ensure students advance effectively through the curriculum. Early alert systems, academic advising, tutoring services, and targeted academic support interventions are used to address challenges and promote persistence and timely degree completion.

Student and Faculty Satisfaction
Student and faculty satisfaction are evaluated through annual surveys assessing course delivery, instructional resources, advising quality, facilities, and overall program effectiveness. Survey results, supplemented by focus groups and informal feedback, are reviewed by program faculty and academic leadership to identify opportunities for enhancement.

Cost-Effectiveness
The Office of Academic Affairs and the Business and Finance Division conduct periodic reviews of enrollment trends, instructional costs, faculty utilization, and program expenditures. These reviews ensure that the program remains financially sustainable while maintaining instructional quality and appropriate levels of student support.

Advisory and Workforce Input
Input from industry partners and the program advisory board is incorporated into periodic program

reviews to ensure continued alignment with workforce needs, emerging technologies, and employer expectations. Advisory feedback supports ongoing curriculum relevance and responsiveness to regional and statewide workforce demands.

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

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

The Bachelor of Science in Applied Technology aligns closely with Maryland's goals to promote minority student access, success, and educational equity, as articulated in COMAR 13B.02.03.05 and the Maryland State Plan for Postsecondary Education. Capitol Technology University maintains a strong institutional commitment to diversity, inclusion, and equitable access to STEM and technology education, particularly in disciplines where minority participation remains historically underrepresented.

The proposed program is intentionally designed to broaden access to high-demand applied technology careers for students from diverse backgrounds, including African American, Hispanic/Latino, female, first-generation college students, military veterans, and adult learners. Its applied, interdisciplinary structure provides an accessible pathway for students who may not pursue traditional engineering programs but seek workforce-relevant technical education grounded in hands-on learning and systems-level understanding.

The Bachelor of Science in Applied Technology supports minority student access and success through several key strategies:

• Transfer-friendly pathways, including articulation agreements and structured advising for students transferring from Maryland community colleges, many of which serve large and diverse student populations.

• Comprehensive academic advising and mentoring, supported by early alert and intervention systems that help identify and address academic challenges early in a student's program of study.

• Financial support mechanisms, including institutional scholarships, federal and state financial aid, and military education benefits, which reduce financial barriers for economically disadvantaged and underrepresented students.

• Applied, project-based learning, which research has shown to improve engagement, persistence, and completion rates among students from diverse backgrounds in STEM and technology fields.

• Inclusive instructional practices, supported by faculty development initiatives focused on culturally responsive teaching strategies and Universal Design for Learning (UDL), ensuring that instructional methods address diverse learning styles and student needs.

In addition, Capitol Technology University supports institutional diversity goals through campus-wide initiatives such as multicultural programming, student affinity organizations, inclusive recruitment practices, and the integration of equity and inclusion principles into strategic planning and academic decision-making.

Through these efforts, the Bachelor of Science in Applied Technology directly supports Maryland's statewide priorities related to minority student achievement. The program advances Goal 1 (Student

Access) by expanding entry points into applied technology education and Goal 2 (Student Success) by providing a supportive, inclusive, and career-relevant academic environment that promotes persistence, completion, and workforce readiness for underrepresented students.

O. Relationship to Low Productivity Programs Identified by the Commission

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

The proposed Bachelor of Science in Applied Technology is not a direct continuation, replacement, or restructuring of a specific low-productivity program identified by the Maryland Higher Education Commission. Rather, the program has been developed as part of Capitol Technology University's broader academic planning and continuous improvement process, informed by internal program reviews, enrollment trends, and workforce demand analysis.

While not formally tied to a designated low-productivity program, the Bachelor of Science in Applied Technology is designed to optimize the use of existing institutional resources, particularly in areas where enrollment in narrowly focused or traditional technical programs has declined. Through this approach, the university is able to improve overall instructional efficiency and academic productivity without discontinuing or negatively impacting existing programs.

Specifically, the program will:

• Leverage existing faculty expertise across applied engineering technology, systems, computing, and management disciplines, including faculty whose instructional capacity may not be fully utilized due to lower enrollments in specialized programs.

• Utilize shared classroom, laboratory, and instructional infrastructure, including technology laboratories and computing resources, thereby minimizing duplication of equipment and reducing incremental operating costs.

• Rely on existing administrative, advising, and library support structures, avoiding the need for additional overhead while maintaining adequate student support services.

• Improve overall program productivity by attracting transfer students, adult learners, and workforce-oriented students, contributing to stronger enrollment, retention, and degree completion outcomes.

In this way, although the Bachelor of Science in Applied Technology is not directly associated with a specific low-productivity program identified by the Commission, it reflects a strategic realignment of instructional resources toward a flexible, interdisciplinary program that better aligns with student demand, labor market needs, and institutional sustainability goals.

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 extensive experience delivering online and hybrid instruction at both the undergraduate and graduate levels in technology, engineering, computing, and business disciplines.

Capitol Technology University is also an approved participant in the National Council for State Authorization Reciprocity Agreements (NC-SARA), which authorizes the institution to offer distance education to students residing in other SARA member states. This authorization ensures that the university meets all applicable state and national requirements for distance education delivery.

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

Capitol Technology University affirms that it complies with the Council of Regional Accrediting Commissions (C-RAC) guidelines for the evaluation and delivery of distance education. Institutional policies, instructional practices, and support services ensure that distance-delivered coursework meets the same academic standards as on-campus instruction.

Specifically, the university ensures that:

• Curriculum quality, academic rigor, and learning outcomes are consistent across on-campus, hybrid, and online delivery formats.

• Regular and substantive faculty–student interaction is maintained through scheduled virtual class sessions, discussion boards, assignment feedback, and direct instructor communication.

• Student identity verification is conducted through secure authentication protocols within the learning management system and assessment platforms, protecting academic integrity.

• Student support services, including academic advising, tutoring, library access, technical support, and career services, are equally available to distance education students.

• Technology infrastructure and support are maintained to ensure reliable access to Canvas, communication tools, and instructional resources.

• Faculty training in online pedagogy and LMS use is required for instructors teaching online or hybrid courses.

The Bachelor of Science in Applied Technology is designed to be delivered primarily in an on-campus format, reflecting its emphasis on hands-on instruction, applied laboratories, and project-based learning. However, selected courses—particularly in general education, computing, management, and selected technical areas—may be offered in online or hybrid formats. All distance-delivered components will adhere fully to institutional policies, C-RAC guidelines, and applicable accreditation standards.