

PROPOSAL FOR:

X **NEW INSTRUCTIONAL PROGRAM**

SUBSTANTIAL EXPANSION/MAJOR MODIFICATION

COOPERATIVE DEGREE PROGRAM

X **WITHIN EXISTING RESOURCES or REQUIRING NEW RESOURCES**



Institution Submitting Proposal

Fall 2025

Projected Implementation Date

**Master of Philosophy in
Artificial Intelligence**
Award to be Offered

799.10

Suggested H.E.G.I.S. Code

**Master of Philosophy in
Artificial Intelligence**
Title of Proposed Program

110102.0000

Suggested C.I.P. Code

Graduate School
Department of Proposed Program

Dr. Najam Hassan
Name of Department Head

Dr. Ashley Babcock
Dean of Graduate
School

Albabcock@captechu.edu
Contact E-Mail Address

301-369-3612
Contact Phone Number

RAJIS 12/13/24

President/Chief Executive Approval

DECEMBER 13, 2024

Date Endorsed/Approved by Governing Board



December 13, 2024

Dr. Sanjay Rai
Secretary of Maryland Higher Education
Maryland Higher Education Commission
6 N. Liberty Street
Baltimore, MD 21201

Dear Dr. Rai,

Capitol Technology University is requesting approval to offer a **Master of Philosophy in Artificial Intelligence** degree. The degree curriculum will be taught using existing faculty and courses at our university. The mission of Capitol Technology University is to provide practical education in engineering, computer science, information technology, and business that prepares individuals for professional careers and affords the opportunity to thrive in a dynamic world. A central focus of the university's mission is to advance practical working knowledge in areas of interest to students and prospective employers within the context of Capitol's degree programs. The university believes that a **Master of Philosophy in Artificial Intelligence** degree is consistent with this mission.

The requirement for experts in Artificial Intelligence at the highest level is experiencing significant growth. This program is in response to that need. The **Master of Philosophy in Artificial Intelligence** degree is primarily aimed at experienced Artificial Intelligence personnel who desire to advance in their careers by earning a master's degree. This degree will also serve as a pathway to students who want to ultimately earn a Doctor of Philosophy in the artificial intelligence field.

To respond to needs of the Artificial Intelligence field, we respectfully submit for approval an **MPhil in Artificial Intelligence** degree. Please find the required letter confirming the adequacy of the university's library to serve the needs of the students in this degree.

Respectfully,

A handwritten signature in blue ink, appearing to read 'BLS', with a long horizontal flourish extending to the right.

Dr. Bradford L. Sims, PhD
President



December 13, 2024

Dr. Sanjay Rai
Secretary of Maryland Higher Education
Maryland Higher Education Commission
6 N. Liberty Street
Baltimore, MD 21201

Dear Dr. Rai,

This letter is in response to the need for confirmation of the adequacy of the library of Capitol Technology University to support the proposed **Master of Philosophy in Artificial Intelligence** degree. As president of the university, I confirm that the library resources, including support staff, are more than adequate to support this degree program. In addition, the university is dedicated to, and has budgeted for, continuous improvement of its library resources.

Respectfully,

A handwritten signature in blue ink, appearing to read 'BLS'.

Dr. Bradford L. Sims, PhD
President



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

Institution Submitting Proposal	Capitol Technology University, Laurel, Maryland
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Each action below requires a separate proposal and cover sheet.

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

Payment <input checked="" type="radio"/> Yes	Payment <input type="radio"/> R*STARS # 97622	Payment	Date
Submitted: <input type="radio"/> No	Type: <input type="radio"/> Check # 97622	Amount: 850.00	Submitted: 12/13/24

Department Proposing Program	The Graduate School		
Degree Level and Degree Type	Master of Philosophy		
Title of Proposed Program	Artificial Intelligence		
Total Number of Credits	30		
Suggested Codes	HEGIS: 799.10	CIP: 110102.0000	
Program Modality	<input type="radio"/> On-campus <input checked="" type="radio"/> Distance Education (fully online) <input type="radio"/> Both		
Program Resources	<input checked="" type="radio"/> Using Existing Resources <input type="radio"/> Requiring New Resources		
Projected Implementation Date <small>(must be 60 days from proposal submission as per COMAR 13B.02.03.03)</small>	<input checked="" type="radio"/> Fall <input type="radio"/> Spring <input type="radio"/> Summer Year: 2025		
Provide Link to Most Recent Academic Catalog	URL: https://catalog.capttechu.edu/		

Preferred Contact for this Proposal	Name:	Christopher J. Urdzik
	Title:	Director of Masters Programs
	Phone:	(240) 858-1910
	Email:	curdzik@capttechu.edu

President/Chief Executive	Type Name:	Dr. Bradford L. Sims, PhD
	Signature:	Date: 12-13-24
	Date of Approval/Endorsement by Governing Board:	

Proposed Master of Philosophy in Artificial Intelligence Degree
The Graduate School
Capitol Technology University
Laurel, Maryland

A. Centrality to Institutional Mission and Planning Priorities:

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

The **Master of Philosophy in Artificial Intelligence** degree is a unique program designed to meet the long-standing needs of disseminating research skills to those working in the artificial intelligence field in government and industry. The proposed **Master of Philosophy in Artificial Intelligence** degree is for current professionals in the field of AI and those working in associate fields that may require some grounding in AI principles before advancing with their research effort. The University is in a unique position to give those students an avenue to pursue proficiency in this area using an interdisciplinary methodology, cutting-edge courses, and dynamic faculty. Graduates will contribute significantly to the AI field with the creation of new knowledge and ideas. This degree is also aimed at those that may want to explore research studies before starting a Doctor of Philosophy degree in AI.

The completion of the **Master of Philosophy in Artificial Intelligence** degree requires students to complete 30 credit-hours of study. There are 12 credit-hours of AI content courses and 18 credit-hours of research courses; the research courses culminate in students producing, presenting and defending a master's thesis after receiving the required approvals from an Academic Review Board and Institutional Review Board. Students will conduct their research effort under the direction of an assigned Thesis Chair. Section G of this document will explain the curriculum in more detail.

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

Capitol Technology University operates on four strategic goals:

- a. Expand Educational Offerings, Increase Program Completion:** *Capitol Technology University is an institution that offers career-relevant curricula with quality learning outcomes. The strategy includes continuing to expand educational offerings, increasing program completion, and raising learner qualifications and outcomes.*
- b. Increase Enrollment and Institutional Awareness:** *Capitol will accelerate its goal pursuit to become more globally renowned and locally active through student, faculty and staff activities. Enrollment will grow to 650 undergraduates, 350 masters' students and 450 doctoral candidates.*
- c. Improve the Utilization of University Resources and Institutional Effectiveness While Expanding Revenue:** *Capitol will likely continue to be 80% financially dependent on student tuition and fees. We plan to enhance our resources by expanding the range and amount of funding from other streams and aligning costs with strategic initiatives.*
- d. Increase the Number and Scope of Partnerships:** *Capitol's service to our constituents and sources of financial viability both depend upon participation with continuing and new partner corporations, agencies, and schools.*

The proposed **Master of Philosophy in Artificial intelligence** degree supports all the University's four strategic goals. The proposed degree builds upon the existing areas of degrees at the undergraduate level:

The University's programs have been preparing professionals for the rapid advances in computer science, cybersecurity, intense global competition, and increasingly sophisticated technological environments for decades. The **Master of Philosophy in Artificial Intelligence** degree follows that tradition and the links with Artificial Intelligence sectors both locally and nationally. The proposed degree is fully supported by the University's Vision 2025 and Strategic Plan 2017-2025. It also segues into the next Strategic Plan currently under development. Funding to support the **Master of Philosophy in Artificial Intelligence** degree is already available within the existing budget as we're using existing faculty and courses already scheduled as part of other approved degree programs.

The University has active partnerships in the private and public sectors (e.g., NASA, Parsons Corporation, Leidos, Patton Electronics, Lockheed Martin, Northrup Grumman, Cyber Security Forum Initiative (CSFI), Internal Revenue Service (IRS), and National Security Agency (NSA)). The **Master of Philosophy in Artificial Intelligence** degree will provide new opportunities for partnerships. The increase in alliances and the placement of our graduates in our partner institutions will serve to expand the University's enrollment and reputation. While additional students will increase financial resources, new partnerships, and grants in the Artificial intelligence field will help diversify and increase financial resources.

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

Capitol Technology University will support the proposed program through the same process and level of support as the University's existing programs. The University has also budgeted funds to support program and course development, online support, office materials, travel, professional development, and initial marketing. There is no substantial impact on the institution due to the advanced budgeting of these funds. If approved, the program will be self-sustaining going forward.

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

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

The proposed degree is an integral part of the University's Strategic Plan for FY 2017-2025 and forward. The institutional and departmental budgets for FY 2022-2023, as well as the forecasted budgets going forward, include funding for the administrative, financial, and technical support of the new degree.

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

Capitol Technology University is fully committed to continuing the proposed **Master of Philosophy in Artificial Intelligence** degree program for a sufficient period to allow enrolled students to complete the program. The courses that form this degree program have been part of the University's curriculum for 3-7 years to date.

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

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

a. The need for advancement and evolution of knowledge.

Artificial Intelligence is the subject of maximizing your resources by science and technology. There are few more critical concerns facing the nation and the world and there is no pathway to achieve currently, and this proposal is to offer a solution based on the STEM knowledge needed for these experts to acquire research skills in addition to their Artificial intelligence knowledge.

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

Capitol Technology University is a diverse multiethnic and multiracial institution with a long history of serving minority populations. The University has a 51% minority student population, with 7% undisclosed. The Black/African American population is 34%. The university has a military/veteran population of 22%. The University also has a 22% female population – a significant percentage given its status as a technology institution. If approved, the proposed **Master of Philosophy in Artificial Intelligence** degree will expand the field of opportunities for minorities and disadvantaged students.

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, the university is a diverse multiethnic and multiracial institution with a long history of serving minority populations. The University has a 51% minority student population, with 7% undisclosed.

The Black/African American population is 34%. The University has a military/veteran population of 22%. The university also has a 22% female population – a significant percentage given its status as a technology institution. If approved, the proposed **Master of Philosophy in Artificial Intelligence** degree will expand the field of opportunities for minorities and disadvantaged students. Given the substantial minority population of Capitol Technology University, it is also reasonable to assert that the **Master of Philosophy in Artificial Intelligence** degree will add to the base of minority participation in the Artificial intelligence field.

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

The 2022 Maryland State Plan for Postsecondary Education articulates three goals for postsecondary education: **a) Student Access; b) Student Success; c) Innovation**

Goal 1: Student Access

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

Capitol Technology University is committed to ensuring equitable access to affordable postsecondary education for all Maryland residents. The University meets its commitment in this arena through its diverse campus environment, admissions policies, and academic rigor.

- Priority 1: Study the affordability of postsecondary education in Maryland
- Priority 2: Examine and improve financial literacy programs for students and families to encourage financial planning to pay for postsecondary education.
- Priority 3: Analyze systems that impact how specific student populations access affordable and quality postsecondary education.

The Capitol Technology University community is committed to creating and maintaining a mutually respectful environment that recognizes and celebrates diversity among all students, faculty, and staff. The University values human differences as an asset and works to sustain a culture that reflects the interests, contributions, and perspectives of members of diverse groups. The University delivers educational programming to meet the needs of diverse audiences. We also seek to instill those values, understanding, and skills to encourage leadership and service in a global multicultural society.

The composition of the University's student body reflects the institution's commitment to diversity. Capitol Technology University has a 51% minority student population, with 7% undisclosed. The Black/African American population is 34%. The University has a military/veteran population of 22%. The University also has a 22% female population—a significant percentage given its status as a technology university.

Achievement gaps: The University provides leveling courses in support of individuals attempting a career change to a field of study not necessarily consistent with their current skills. There are situations where undergraduate courses best serve student needs in subject areas. The University makes those courses available.

The University engages in diversity training for its institutional population, including students. Diversity and inclusiveness are built into the curriculum allowing graduates to operate effectively in a global environment. The University supports multiple diversity enhancing actions, including team projects and grants across degrees. This has proven effective at supporting numerous aspects of diversity.

Capitol Technology University does not discriminate on the basis of race, color, national origin, sex, age, sexual orientation, or handicap in admission, employment, programs, or activities.

Through its academic programs, Capitol Technology University seeks to prepare all of its graduates to demonstrate four primary characteristics:

- **Employability:** The ability to enter and advance in technical and managerial careers, appropriate to their level and area of study, immediately upon graduation.

- **Communications:** Mastery of traditional and technological techniques of communicating ideas effectively and persuasively.
- **Preparation of the Mind:** The broad intellectual grounding in technical and general subjects required to embrace future technical and managerial opportunities with success.
- **Professionalism:** Commitment to life-long learning, ethical practice, and participation in professions

The proposed **Master of Philosophy in Artificial Intelligence** degree and University financial aid will be available to all Maryland residents who qualify academically for admission. The University has successfully managed to support Financial Aid for its students since its founding in 1927.

The **Master of Philosophy in Artificial Intelligence** degree, with its academic rigor, will produce highly qualified Artificial intelligence leaders with the highest level of skills and abilities to advance their careers. The University has a proven record of rigorous high-quality education in all of its degrees. The University is fully accredited by five accrediting organizations. The University receives its regional accreditation from the Middle States Commission on Higher Education (MSCHE). The University also has specialized accreditation from the International Accreditation Council of Business Education (IACBE), Accreditation Board for Engineering and Technology (ABET), National Security Agency (NSA), and Department of Homeland Security (DHS). The **Master of Philosophy in Artificial Intelligence** degree is consistent with the MSCHE criteria for regional accreditation of the delivery of high-quality higher education.

Goal 2: Student Success

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

The content courses for the **Master of Philosophy in Artificial Intelligence** degree will be offered in a sync manner but allowing for real time communication using the Canvas Learning Management System and Zoom. The University provides a tuition structure that is competitive with its competitors. The University tuition structure does not differentiate between in state and out-of-state students. The University's Student Services provide advising, tutoring, virtual job fair attendance, and other activities supporting student completion and employment for both on-ground and online students.

Students receive information throughout the admissions process regarding the cost to attend the University. The information is also publicly available on the University website. The University's Admissions Office and Office of Financial Aid identify potential grants and scholarships for each student. The Office of Financial Aid also provides plans for each student to reduce potential student debt. The net cost versus gross costs is identified clearly for the student. Students receive advice from Financial Aid Advisors before enrolling in classes for the first time. Admissions personnel, Student Services Counselors, and Departmental Chairs advise students of the need for academic readiness as well as the degree requirements. Academic Advisors also develop a specific success pathway for each student.

The University's tuition increases have not exceeded 3%. The University also has a tuition guarantee for undergraduates, which means full-time tuition is guaranteed not to increase more than 1% per year above the rate at the time of initial enrollment. The tuition remains at this rate if the student remains enrolled full-time without a break in attendance.

The University provides services and learning tools to guide students to successful degree completion. Programs such as Early Alert give the University's faculty and staff opportunities for early student intervention on the pathway to graduation. This program applies to all students regardless of the mode of course delivery or degree program. Capitol Technology University is also a transfer-friendly institution and participates in multiple programs for government and military credit transfer. Capitol Technology University participates in the Articulation System for Maryland Colleges and Universities (ARTSYS) and has numerous transfer agreements with local institutions at all degree levels.

The University has in place services, tutoring, and other tools to help ensure student graduation and successful job placement. The University hosts a career (job) fair twice a year. The University has an online career center available to all students covering such topics as career exploration, resume writing, job search techniques, social media management, mock interviews, and assistance interpreting job descriptions, offers, and employment packages.

The University also works with its advisory boards, alumni, partners, and faculty to help ensure the degrees offered at the University are compatible with long-term career opportunities in support of the state's knowledge-based economy.

Goal 3: Innovation

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

Capitol Technology University's past, present, and future are inextricably intertwined with innovation. The University has a long tradition of serving as a platform for the use of new and transformative approaches to delivering higher education. New technology and cutting-edge techniques are blended with proven strategies to enable student success in all classroom modalities as well as in a successful career after graduation. As a small institution, Capitol Technology University has the ability to rapidly integrate new technologies into the curriculum to better prepare students for the work environment. The University designs curriculum in alliance with its accreditation and regulating organizations and agencies.

The University also employs online virtual simulations in a game-like environment to teach the application of knowledge in a practical hands-on manner. The University engages with a partner creating high-level virtual reality environments for use by students pursuing this degree. This use of current technology occurs in parallel with traditional, proven learning strategies. These elements of the University's online learning environment are purposeful and intended to improve the learning environment for both the student and faculty member. The approach is intentionally designed to increase engagement, improve outcomes, and improve retention and graduation rates. The University believes that innovation is the key to successful student and faculty engagement. Example: The University engages its students in fusion projects that allow students to contribute their skills in interdisciplinary projects such as those in our Astronautical Artificial Intelligence and Cyber Labs. In those labs, students become designers, builders, and project managers (e.g., to send a CubeSat on a NASA rocket) and data analysts (e.g., to analyze rainforest data for NASA). The University's students launched their latest satellite aboard a NASA rocket from a location in Norway at the beginning of the 2019 Fall Semester.

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

Within Maryland there are estimated to be in excess of 25,000 cyber-based employees of private and public research facilities, civil corporations, and commercial companies all provide Maryland residents Artificial intelligence jobs, within this sector the AI need is increasing. The US Army has an AI laboratory in Maryland to lead this industry and is expected to expand. According to the U.S. Bureau of Labor Statistics (BLS), these positions are across Maryland and the majority are within a 25mile radius of the Laurel Campus of which less than 50% have a Master's degree. Laurel is geographically positioned for the majority of Government cyber positions and those of the DoD and supporting agencies as a pool of students and positions for employment. Furthermore, as this subject continues to become more mainstream, it will open new employment opportunities.

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

Graduates with the **Master of Philosophy in Artificial Intelligence** degree will be expected to fill technical executive and senior-level positions in commercial companies as well as local, state, and federal government with a variety of titles such as

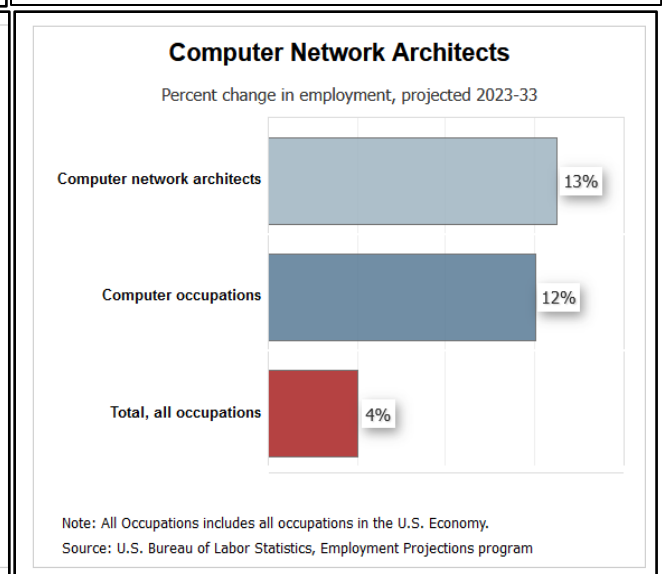
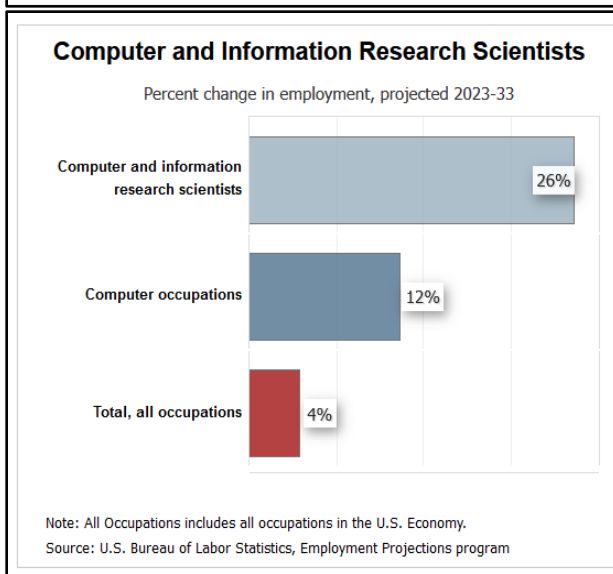
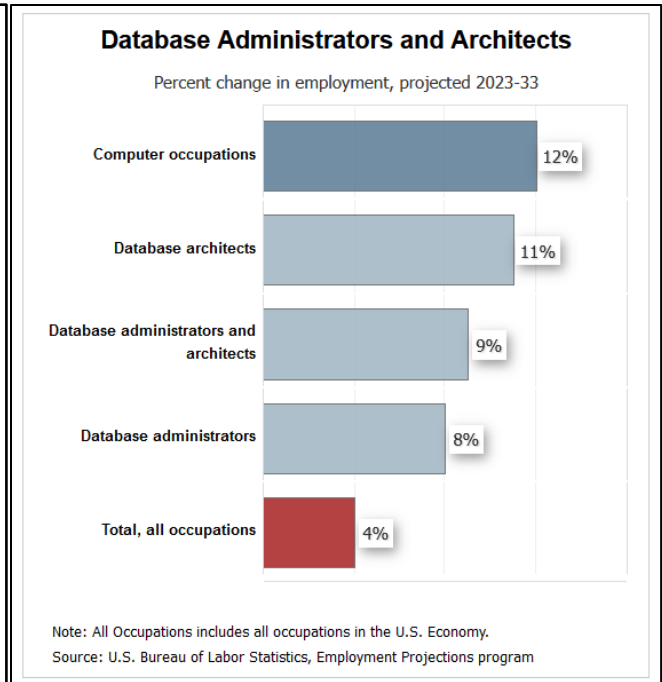
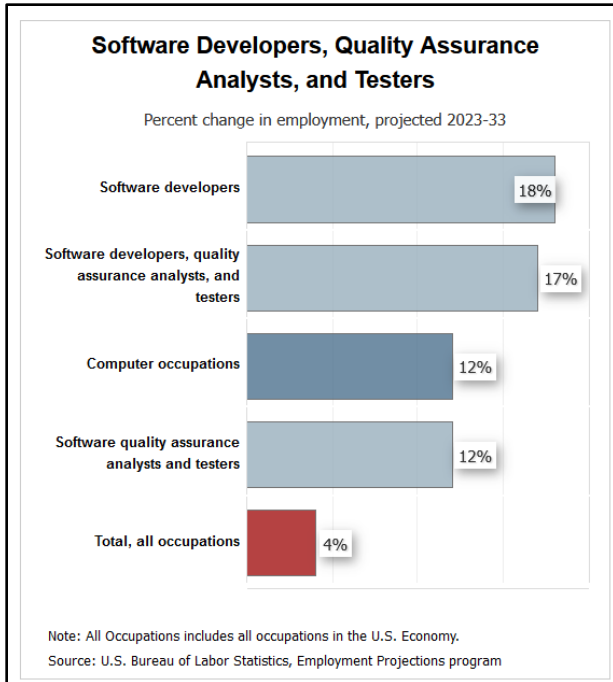
- AI Scientist
- AI Software Engineer
- Chief, Artificial Intelligence Solutions
- Vice President Research
- Senior Director, Artificial intelligence
- Software Developers
- Systems Engineers
- University Faculty

Graduates from the proposed **Master of Philosophy in Artificial Intelligence** degree will possess a technical knowledge in artificial intelligence with the ability to serve as top leaders in their field. Graduates will also possess the required knowledge in Artificial intelligence to serve as a subject matter expert and work in private companies or government agencies. In addition to support those related to the nation's defense will be served by this degree.

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

The Occupational Outlook Handbook (OOH), one key resource produced by the Bureau of Labor Statistics (BLS). The four top occupations that would benefit from a **Master of Philosophy in Artificial Intelligence** degree are 1) Computer & Information Research Scientists; 2) Software Developers; 3) Computer Network Architects; and 4) Database Architects. See Figure 1 for details of this double-digit, AI-related occupational growth through 2033.

Figure 1. Percent Change in AI-Related Employment Projected 2023-2033



(Source: <https://www.bls.gov/ooh/computer-and-information-technology/software-developers.htm#tab-6>; retrieved 11/05/2024).

(Source: <https://www.bls.gov/ooh/computer-and-information-technology/database-administrators.htm#tab-6>; retrieved 11/05/2024).

(Source: <https://www.bls.gov/ooh/computer-and-information-technology/computer-and-information-research-scientists.htm#tab-6>; retrieved 11/05/2024).

(Source: <https://www.bls.gov/ooh/computer-and-information-technology/computer-network-architects.htm#tab-6>; retrieved 11/05/2024).

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

Table 1 below details national projections for the number of occupational openings in four areas where AI will be in great demand up to 2032. Additionally, a current snapshot of open AI-related

employment opportunities (requiring security clearances) in the DC-MD-VA region is displayed in Table 2.

Table 1. National Employment Projections of AI-related Positions up to 2032

National Employment Projections of Artificial Intelligence-Related Positions up to 2032					
Occupation Name	Base (2022)	Projected (2032)	Change	Percent Change	Average Annual Openings
Computer and Information Research Scientists	36,500	44,800	8,300	22.7%	3,400
Software Developers	1,594,500	2,004,900	410,400	25.7%	136,300
Computer Network Architect	180,200	186,600	6,400	3.6%	10,200
Database Architect	64,000	70,400	6,400	10.0%	4,500

(Source: <https://projectionscentral.com/Projections/LongTerm>, retrieved 11/05/2024)

Table 2. AI-Related Employment Opportunities for DC-MD-VA Region (Snapshot on 5 Nov 2024)

AI-Related Employment Opportunities in DC-MD-VA Region (Snapshot on 5 Nov 2024)				
Location	Computer Research Scientist	Software Developer	Computer Analyst	Database Architect
Maryland	1,319	4,524	706	120
Virginia	2,639	6,579	1235	328
Washington DC	620	1,177	303	51
Total	4,534	12,280	2,224	499

(Source: <https://clearancejobs.com>, retrieved 11/05/2024)

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

In 2024, the university has had on average 22 inquiries per month for master’s degrees in artificial intelligence. Based on historical data for other programs, we anticipate enrollments of 5 students per semester in the first year, growing to 10 enrollments per semester within 4 years of offering the **Master of Philosophy in Artificial Intelligence** degree.

D. Reasonableness of Program Duplication

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

Artificial Intelligence (AI) is set to become a global transformational force affecting government, industry and society in general. Within the State of Maryland, there are several public and private universities that offer master's degrees in computer science with tracks or specializations in AI-related subjects. Johns Hopkins offers a comprehensive MS in Artificial Intelligence consisting of a solid core curriculum and numerous electives to choose from. The difference in our proposed degree is that the **Master of Philosophy in Artificial Intelligence** is primarily research-focused with an addition of four foundational content courses in AI. The degree is aimed at qualified professionals with a background in AI-related fields who seek to earn a master's degree through a research endeavor. If approved, Capitol Technology University's **Master of Philosophy in Artificial Intelligence** degree will position its graduates to fill the requirement for leaders and top experts in Artificial Intelligence in Maryland and throughout the country.

- 2. Provide justification for the proposed program.**

The proposed **Master of Philosophy in Artificial Intelligence** degree is strongly aligned with the University's strategic priorities and is supported by adequate resources. The proposed **Master of Philosophy in Artificial Intelligence** degree will strengthen and expand upon the existing technology and management degree programs at the University. In addition, the **Master of Philosophy in Artificial Intelligence** degree will be an option for all students as the field integrates well with the market needs of the University's other programs. There is a thorough discussion of the need for the program in Sections B and C of this document.

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

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

The university does not anticipate any impact on the implementation or maintenance of high-demand programs at HBIs. The proposed **Master of Philosophy in Artificial Intelligence** degree is largely research focused and unique to Capitol Technology University.

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

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

The University does not anticipate any impact on the uniqueness and institutional identities and missions of HBIs. There are no other **Master of Philosophy in Artificial Intelligence** degrees in the state of Maryland.

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

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

The proposal is a rigorous collaboration between selected faculty and administrators and was submitted to the university's executive council for scrutiny and approval. Please see Section I for a detailed list of the faculty's backgrounds and qualifications. Capitol Technology University is a STEM university with a strong focus on computer science, cybersecurity, artificial intelligence, technical management and engineering. It is a teaching university offering degrees at undergraduate, master's and doctoral levels.

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

Educational Objectives:

The **Master of Philosophy in Artificial Intelligence (AI)** degree is designed for post-graduate professionals seeking to earn a master's degree by conducting sustained original research in various areas crucial to the development and use of AI. Such areas include robotics, computer science, hardware and software engineering, machine learning, and physics. It is ideal for experienced professionals seeking to explore research studies before pursuing a doctorate degree or for those seeking career advancement opportunities by earning a graduate degree.

Students in this program will complete four courses in foundational principles of AI before conducting original research in an approved area of this discipline. Students will present their research and findings in a written master's thesis and orally defend their work.

Learning Outcomes:

Upon completion of the program, graduates will be able to:

- Integrate the theoretical basis and practical applications of Artificial Intelligence into their professional work.
- Apply research and problem-solving skills to their career field.
- Evaluate science to provide economic solutions to Artificial Intelligence.
- Demonstrate the mastery of skills necessary to meet the needs of Artificial Intelligence globally.
- Support research and the advancement of knowledge in Artificial Intelligence.

3. Explain how the institution will:

a. Provide for assessment of student achievement of learning outcomes in the program.

Students will be assessed on achievement of learning outcomes through a variety of discussion forums, written assignments, projects and presentations. All assignments are graded using a specific rubric and are mapped to specific course learning outcomes and program outcomes. All courses are delivered asynchronously online using specific course templates embedded in the Canvas learning management system.

b. Document student achievement of learning outcomes in the program.

Student achievement of learning outcomes will be documented through use of a grading rubric for each assignment. Results of rubrics are used to calculate scores/grades which are visible to students in Canvas gradebook for each course. At the end of the course, grades are transferred from Canvas to the university's student management system and then added to students' transcripts.

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

The following is a list of courses for the **Master of Philosophy in Artificial Intelligence** degree program. Students expecting to complete this degree must meet all prerequisites for the courses listed below.

**Master of Philosophy in Artificial Intelligence Courses
(30 Credit-Hours)**

DS 502 Predictive Analytics (3 Credits)

In this course students will learn the data mining and data science methodologies and technologies needed to implement a predictive analytics solution in a given problem domain. The course will emphasize supervised learning techniques but will also introduce and overview machine learning concepts in general. Students will learn hands-on techniques to implement data preparation, model building, model evaluation and model deployment, using the leading industry language Python. Students will demonstrate an ability to apply predictive analytics techniques to a given problem. Students should be familiar with a high-level programming language, preferably Python.

AIT 711 Computer Vision and Deep Learning (3 Credits)

This course will cover modern developments in computer vision and image processing, particularly the use of machine learning and deep learning technologies to achieve solutions to computer vision problems. The course covers relevant deep learning approaches including convolutional neural networks and other deep learning approaches, and students will learn how to apply these technologies to a given problem in the computer vision domain. Prerequisite: DS 502

DS 710 Big Data (3 Credits)

This advanced course will equip the student with the necessary skills to solve complex problems and design solutions using Big Data. The student will be able to gain an understanding of how to design databases to manage large volumes of data, and how that data can be analyzed and translated into meaningful results. The student will be introduced to the field of Analytics, gain an understanding of Enterprise Data Warehousing models, be introduced to Data Mining techniques and tools used for mining the data warehouse, and build specific Data Marts. The student will be introduced to predictive analysis and will be expected to develop models to extract data, perform trend analysis, establish patterns, and make projections.

AIT 716 Advanced Artificial Intelligence (3 Credits)

This course covers selected deep learning and deep neural network technologies, drawn from such topics as convolutional neural networks, recurrent neural networks and generative models. The course will combine coverage of relevant technologies with consideration of emerging innovations and developments in this field. Prerequisite: DS 502.

AIT 700 Fundamentals of Graduate Research & Design (6 Credits)

This course introduces the fundamentals of graduate research and design. The course will focus on graduate-level writing, APA style, and the fundamentals of scientific inquiry. The project will cover the areas of technology research, ethics of research, the stages of the research process, conceptualization and operationalization of research questions, data collection techniques, analytics, an introduction to qualitative and quantitative methods and measurement, a discussion of program evaluation research, and research proposal development.

AIT 725 Artificial Intelligence Research Proposal (6 Credits)

Working under the guidance of an assigned thesis chair, students will produce a proposal for research that is comprehensive in detail and planning and submit this proposal to the Academic Review Board (ARB) for approval. The proposal will address the research topic, scope and aims, objectives and include a timing plan. Students will then begin completing research milestones according to the proposal and research plan. The Institutional Review Board (IRB) application will also need to be completed by this stage. Prerequisite: AIT 700.

AIT 735 Artificial Intelligence Thesis Project and Defense (6 Credits)

During this course, students will complete their research effort and write a thesis under the guidance of their assigned thesis chair. With the thesis completed, students will prepare and deliver an oral presentation summarizing the body of research and defend the same through oral examination by their thesis chair. Prerequisite: AIT 725.

Admissions Requirements

Admission standards will be as rigorous as those established for the master's degree programs. Academic transcripts, resumes and application essays will be carefully considered in the admissions process. Specifically, the admissions requirements for this post-baccalaureate certificate program are:

- a. A baccalaureate-level degree from an accredited college or university (preferably in a technical field) as evidenced by a foreign transcript certified by a credentialing agency, or by an official US or Canadian transcript sent directly to the university.
- b. A statement of purpose that demonstrates compatibility of the applicant's career goals with the educational objectives of the program.
- c. A current résumé or CV
- d. All non-native English speakers must demonstrate a satisfactory level of English proficiency. The following options are acceptable:
 - (i) Test of English as a Foreign Language (TOEFL) minimum score of 80 (internet-based)/550 (paper-based)
 - (ii) International English Language Test (IELTS) minimum overall band score of 6.5 and no individual score lower than 6.0
 - (iii) Duolingo minimum score of 115
 - (iv) LanguageCert's International ESOL B2 exam with all scores at 39 or higher (writing, reading, listening and speaking)

- (v) SAT minimum Evidence-Based Reading and Writing score of 520
- (vi) Evidence showing successful completion (C or higher) of English composition at an accredited university or college within the United States

Program Requirements

The proposed **Master of Philosophy in Artificial Intelligence** degree requires students to successfully complete 30 credit-hours. The three research courses will be 6 credit-hours each (18 credit hours) and four content courses will be 3 credit-hours each (12 credit-hours). The degree program will consist of the courses as described in paragraph 4 above. The degree can be completed over a minimum of 20 months up to a maximum of 3 years.

Courses must be taken for credit and a letter grade. To maintain satisfactory academic performance and good academic standing, students in this program must maintain a minimum grade point average of 3.0.

- 5. Discuss how general education requirements will be met, if applicable.** Not Applicable.
- 6. Identify any specialized accreditation or graduate certification requirements for this program and its students.** Not Applicable
- 7. If contracting with another institution or non-collegiate organization, provide a copy of the written contract.** Not Applicable
- 8. Provide assurance and any appropriate evidence that the proposed program will provide students with clear, complete, and timely information on the curriculum, course and degree requirements, nature of faculty/student interaction, assumptions about technology competence and skills, technical equipment requirements, learning management system, availability of academic support services and financial aid resources, and costs and payment policies.**

The university has a comprehensive online catalog that addresses these areas in detail: <https://catalog.capttechu.edu/>. Additionally, the university has a team of highly proactive and responsive admissions counsellors, graduate advisors, financial aid counsellors and a Dean of Students to ensure students receive the support necessary to successfully complete their program.

- 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.**

In addition to our comprehensive online catalog, our university website also provides students with timely and professional marketing and program details: <https://www.capttechu.edu/degrees-and-programs>. We also invite prospective students to join us at our monthly virtual open house events to learn more about how the university can help them achieve their academic and professional goals.

H. Adequacy of Articulation:

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

This program does not currently have articulation partners. However, the articulation process will work as it does for the University's current degrees. The University is very active with its transfer partners throughout the state and beyond. The goal of the University is to work with partners to make the transfer as seamless as possible and to maximize the student's transfer credits as possible. There are University transfer admissions personnel to guide the student through the process.

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

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

Almost all of the faculty listed below have been engaged with the University for at least five years. All of the faculty members but one hold terminal degrees. The mentored-research courses (715, 725, 735) are delivered one-on-one with dedicated Thesis Chair for each student. The University leadership is confident in the quality of the faculty and their abilities to provide a learning environment supportive of the University goals for student success. Additional doctoral faculty will be added as needed.

Instructors who will be engaged with the **Master of Philosophy in Artificial Intelligence degree** are:

INSTRUCTOR	BACKGROUND	COURSES TAUGHT
Dr. Najam Hassan Department Chair Fulltime Faculty	PhD in Business Analytics and Decision Sciences MS in Computer Science	DS-502 AIT-711 DS-710 AIT-716
Dr. Tashnim Chowdhury Fulltime Faculty	PhD in Information Systems (AI and Machine Learning)	DS-502 AIT-711 DS-710 AIT-716
Dr. Atif Mohammad Adjunct Professor Thesis Chair	PhD in Cyber Security PhD in Scientific Computing	DS-502 AIT-716 AIT-725 AIT-735
Dr. Mais Nijim Adjunct Professor	PhD in Computer Science	AIT-711 DS-502
Dr. Bary Pollack Adjunct Professor	PhD in Computer Science	AIT-711 DS-710
Dr. Christopher Gorham Adjunct Professor	PhD in Technology	AIT-701 AIT-716

Dr. Thomas Maroney Adjunct Faculty Thesis Chair	DSc in Cybersecurity	AIT-725 AIT-735
Dr. Pao Lee Adjunct Faculty Thesis Chair	PhD Unmanned (Uncrewed) or Autonomous Systems Applications 27 years of extensive industry work experience in Data Science/Artificial Intelligence/Machine Learning/Neural Networks/Deep Learning	AIT-725 AIT-735
Elena Vishnevskaya Adjunct Faculty	MS in Computer Science	AIT-700

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

a) Pedagogy that meets the needs of the students.

The primary pedagogy for faculty at Capitol Technology University is the Active Learning model. The university believes strongly in a highly interactive, thinking, and hands-on experience for students in each class to the maximum extent possible.

It was two Missouri State professors, historian Charles Bonwell and psychologist James Eison, who coined the term "active learning." In their 1991 book on the subject, *Active Learning: Creating Excitement in the Classroom*, they offered this definition of the concept: "active learning involves students in doing things and thinking about the things they are doing."

The definition, though it seems circuitous, marks a definitive pedagogical shift in college teaching and learning. Rather than think about what they are watching, hearing, or reading, students are first encouraged to be "doing" something in class, and then to apply critical thought and reflection to their own classroom work and activity. Their argument was backed up by research. Even Bligh, 20 years earlier, had pointed out that the immediate rehearsal of new information and knowledge had a significant impact on learning.

This approach is as helpful in the sciences as it is in the arts or humanities: whether it's organic chemistry, creative writing, or behavioral economics, concepts are all best understood through repeated practice and open, social exploration. The central tenet of active learning is that practice matters, and that classroom time is better spent giving students opportunities to work with concepts over and over, in a variety of ways and with opportunities.

The central tenet of active learning — that practice and interaction matters— can be applied across disciplines for immediate feedback, so that knowledge can take hold in their own minds.

(Source: Preville, P. (2018, May 1). *Active Learning: The Perfect Pedagogy for the Digital Classroom*.)

All faculty receive regular periodic and recurring pedagogical training during the academic year. Those training sessions occur in a hybrid format – simultaneously live online and live on-ground in the classroom. The sessions are designed to reach all faculty, both full-time and adjunct, in order to ensure everyone receives the training. Additionally, the sessions are

recorded for those faculty who are unable to attend the live training session due to other professional and teaching commitments.

b) The Learning Management System

The University's Department of Online Learning and Information Technology Division supports the online program needs of faculty and students. The Department of Online Learning and IT Help Desk provide 24-hour support to the faculty. Canvas is the University's online Learning Management System. When a new faculty member is assigned to teach an online course, the Department of Online Learning provides formal training for the instructor. New faculty are assigned an experienced faculty mentor to ensure a smooth transition to the online environment as well as to ensure compliance with the institution's online teaching pedagogy. The University believes this provides the highest-level learning experience for the faculty member and, in turn, students attending online classes.

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

Faculty at Capitol Technology University receive training in Keller's ARCS Motivational Model and his associated strategies for distance education/online learning.

A model used in the online delivery of teaching and learning to increase learner motivation is Keller's ARCS motivational model. This model has been considered an important element in online education because of its implications on increased learner motivation and learning outcomes. The Keller's model consists of motivating students by maintaining and eliciting attention (A), such as virtual clinical simulations; making the content and format relevant (R), by modeling enthusiasm or relating content to future use; facilitating student confidence (C), by providing "just the right challenge"; and promoting learner satisfaction (S), by providing reinforcement and praise when appropriate.

Examples of Keller's model include increasing motivation including the arousal of curiosity of students, making the connection between learning objectives and future learning goals, autonomous thinking and learning, and fostering student satisfaction. Keller's ARCS model has been researched by various educational online programs to analyze student motivation and learning outcomes. Keller's model serves as an example and guide for instructors to motivate and increase online engagement with their students as well as research purposes.

A qualitative study by Chan Lin investigated online student learning and motivation. Discussion boards, student projects, and reflection data were collected and analyzed from a 12-week web-based course. Respondents indicated the importance of online feedback from the instructor and peer modeling of course tasks to visualize learning progress. The study revealed using Keller's ARCS strategies fosters greater student online engagement by fostering self-efficacy and a sense of accomplishment.

In a mixed-method study, assessing the use of Keller's ARCS on instructional design, the use of educational scaffolding fostered positive levels of student motivation. Relevancy, attention, confidence, and satisfaction were all common factors associated with student success in the course and course completion.

(Source: Pinchevsky-Font T, Dunbar S. Best Practices for Online Teaching and Learning in Health Care Related Programs. The Internet Journal of Allied Health Sciences and Practice. January 2015. Volume 13 Number 1.)

All faculty receive regular periodic and recurring training on evidence-based practices for distance education/online learning during the academic year. Those training sessions occur in multiple formats: asynchronous, synchronous (i.e., live online), hybrid (i.e., simultaneously live online and live on-ground), and on-ground in the classroom. The sessions are designed to reach all faculty, both full-time and adjunct, to ensure all members receive training. Additionally, the live sessions are recorded for those faculty who are unable to attend the live training session due to other professional commitments or who are teaching classes at the training delivery time. A model used in the online delivery of teaching and learning to increase learner motivation is Keller's ARCS motivational model. This model has been considered an important element in online education because of its implications on increased learner motivation and learning outcomes. The Keller's model consists of motivating students by maintaining and eliciting attention (A), such as virtual clinical simulations; making the content and format relevant (R), by modeling enthusiasm or relating content to future use; facilitating student confidence (C), by providing "just the right challenge"; and promoting learner satisfaction (S), by providing reinforcement and praise when appropriate.

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

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

resources to meet the program's needs.

The University's library currently supports 106 STEM-related degree programs at the bachelor, master's and doctoral level; it's fully prepared to support a **Master of Philosophy Artificial Intelligence** degree.

Library Services: The Puente Library offers extensive services and a wide collection for Capitol Technology University students to be academically successful. Library resources include both a traditional hard-copy collection and a digital virtual library. The library also provides a mailing service for materials borrowed through the Maryland system.

Services provided to online students include:

- "Ask the Librarian"
- Research Guides
- Tutorials
- Videos
- Online borrowing

The John G. and Beverley A. Puente Library provides access to management, decision science, and research methods materials through its 10,000-title book collection, e-books, and its 90 journal subscriptions. The library will continue to purchase new and additional materials in the management, decision science, and research methods area to maintain a strong and current collection in the subject area. Students can also access materials through the library's participation in Maryland's Digital eLibrary Consortium. This online electronic service provides access to numerous databases (Access Science, NetLibrary) that supply students with the documents they need. Available databases include ProQuest, EBSCO, ACM, Lexis Nexis, Taylor Francis, and Sage Publications.

The Puente Library can provide access to historical management and decision science materials through its membership in the Maryland Independent College and University Association (MICUA). Loan agreements with fellow members of these organizations provide the library access to numerous research facilities that house and maintain archives of management and decision science documents. The proximity of the University of Maryland, College Park, and other local area research and academic libraries provides the Puente Library with quick access to these materials as well.

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

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

No new facilities are required for the program. The online class platform is web-based and requires no additional equipment for the institution. The current Learning Management System, Canvas, and Zoom meet the needs of the degree program. The Business and Technology Lab, Computer Science Lab, Cyber Lab, Robotics Lab, and Unmanned Systems Lab meet the potential

research needs of the students. The labs provide both local and virtual support.

2. Provide assurance and any appropriate evidence that the institution will ensure students enrolled in and faculty teaching in distance education will have adequate access to:

a. An institutional electronic mailing system

Capitol Technology University provides an institutional electronic mailing system to all students and faculty. The University requires the use of the email system by all students and faculty in all the institution's modalities of course delivery. Capitol Technology University students and faculty are required to use the institution's email addresses (e.g., xxxxxxxx@captechu.edu) in all University matters and communications. The University uses the email capabilities in Microsoft Office 365 and Microsoft Outlook.

b. A Learning Management System that provides the necessary technological support for distance education

Capitol Technology University provides a robust Learning Management Systems (LMS) through the use of the Canvas LMS by Instructure (www.canvaslms.com). The University pairs Canvas with Zoom (zoom.us) to provide a platform for every student and faculty member to meet face-to-face in a synchronous "live" mode of communication. The University requires Canvas for every class; as a result, every course has a classroom on Canvas and Zoom. All syllabi, grades, and assignments must be entered into Canvas on a timely basis throughout the semester.

Canvas provides the world's most robust LMS. It is a 21st Century LMS; Canvas is a native cloud, Amazon Web Service hosted system. The system is adaptable, reliable, and customizable. Canvas is easy to use for students and faculty. The system is fully mobile and has proven to be timesaving when compared to other systems.

Capitol Technology University has been using Canvas for over eight years. Canvas has proven to be a wholly reliable LMS system that provides the necessary technological support for distance education/online learning.

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

1. Resources and Narrative Rationale.

Table 1. Program 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)	\$180,900	\$233,928	\$304,128	\$389,880	\$492,840
a. Number of F/T Students	0	0	0	0	0
b. Annual tuition/Fee rate	\$0	\$0	\$0	\$0	\$0
c. Total F/T Revenue (a x b)	\$0	\$0	\$0	\$0	\$0
d. Number of P/T Students	15	19	24	30	37
e. Credit Hour Rate	\$670	\$684	\$704	\$722	\$740
f. Annual Credit Hour	18	18	18	18	18
g. Total P/T Revenue (d x e x f)	\$180,900	\$233,928	\$304,128	\$389,880	\$492,840
3. Grants, Contracts and Other External Sources	0	0	0	0	0
4. Other Sources	0	0	0	0	0
TOTAL (Add 1 - 4)	\$180,900	\$233,928	\$304,128	\$389,880	\$492,840

Provide a narrative rationale for each of the resource categories. If resources have been or will be reallocated to support the proposed program, briefly discuss those funds.

a. Reallocated Funds

The University will not need to reallocate funds for the program.

b. Tuition and Fee Revenue

Tuition is calculated based on part-time students only and includes an annual 2.5% tuition increase.

c. Grants and Contracts

There are currently no grants or contracts.

d. Other Sources

There are currently no other sources of funds.

e. Total Year

No additional comments needed.

2. Program Expenditures.

Table 2. Program Expenditures

Expenditure Category	Year 1	Year 2	Year 3	Year 4	Year 5
1. Faculty (b + c below)	\$96,000	\$98,880	\$101,846	\$104,902	\$108,048
a. Number of FTE	1	1	1	1	1
b. Total Salary	\$80,000	\$82,400	\$84,872	\$87,418	\$90,040
c. Total Benefits (20% of salaries)	\$16,000	\$16,480	\$16,974	\$17,484	\$18,008
2. Admin Staff (b + c below)	\$5,942	\$6,091	\$6,244	\$6,400	\$6,559
a. #FTE	0.08	0.08	0.08	0.08	0.08
b. Total Salary	\$4,952	\$5,076	\$5,203	\$5,333	\$5,466
c. Total Benefits	\$990	\$1,015	\$1,041	\$1,067	\$1,093
3. Support Staff (b + c below)	\$36,000	\$46,968	\$61,128	\$78,750	\$99,900
a. Number of FTE	0.45	0.57	0.72	0.9	1.1
b. Total Salary	\$36,000	\$46,968	\$61,128	\$78,750	\$99,900
c. Total Benefits	\$0	\$0	\$0	\$0	\$0
4. Technical Support and Equipment	\$1,050	\$1,429	\$1,920	\$2,550	\$3,330
5. Library	\$0	\$0	\$0	\$0	\$0
6. New or Renovated Space	\$0	\$0	\$0	\$0	\$0
7. Other Expenses	\$6,000	\$7,500	\$9,375	\$11,720	\$14,650
TOTAL (ADD 1-7)	\$144,192	\$177,547	\$180,513	\$204,322	\$232,537

Provide a narrative rationale for each expenditure category. If expenditures have been or will be reallocated to support the proposed program, briefly discuss those funds.

a. Faculty

This figure is an estimate; it's difficult to assign an accurate cost to this degree program because the courses themselves are included in other existing programs and are currently

taught by existing faculty with students enrolled from several other programs. The existing scheduled courses have spare capacity to absorb additional student enrollments without the addition of new faculty assignments/hires.

b. Administrative Staff

Capitol Technology University will continue with the current administrative staff through the proposed time period.

c. Support Staff

Support staff consist of adjuncts who will be contracted to perform the function of a Thesis Chair assigned to students on a one-to-one basis. Each thesis chair can mentor up to 10 students per semester.

d. Equipment

Software for courses is available free to students or is freeware. Additional licenses for the LMS will be purchased by the University at the rate of \$70 per student in Year 1. The rate is estimated to increase by \$5 per year.

e. Library

Money has been allocated for additional materials to be added to the on-campus and virtual libraries to ensure the literature remains current and relevant. However, it has been determined that the current material serves the needs of this degree due to the extensive online database.

f. New or Renovated Space

No new or renovated space is required.

g. Other Expenses

Funds have been allocated for office materials, travel, professional development, course development, marketing, and additional scholarships.

h. Total Year

No additional explanation or comments needed.

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

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

The assessment process at the University consists of a series of events throughout the Academic Year. The results of each event are gathered by the University Assessment Team and stored in Canvas for analysis and use in annual reports, assessments, etc. The University Assessment Team analyzes the results, develops any necessary action plans, and monitors the implementation of the action plans.

The Faculty Senate meets monthly from August through April. The Faculty Senate addresses issues that impact student outcomes as those issues emerge. The leadership of the Faculty Senate then provides a report on the matter to the Academic Dean. The report may include a recommendation or a request to move forward with a committee to examine the issue further. In most cases, the changes only require the Academic Dean to inform the Vice President of Academic Affairs and University President and provide a report that includes a justification and the impact of changes as well as a strategic plan. Significant changes typically require the approval of the Executive Council.

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.

Student Learning Outcomes:

Student learning outcomes for the proposed **Master of Philosophy in Artificial Intelligence** degree will be measured using the instruments identified in Section G and Section M as well as the assessment measures dictated by the accreditation requirements of the University's regional accreditor [i.e., Middle States Commission in Higher Education (MSCHE)]. This program is designed to meet the requirements of MSCHE. The University will also evaluate student achievement of the learning outcomes using the UK Quality Assurance Agency for Higher Education (QAA) Framework for Higher Education Qualifications and its related assessment tools. The University is in good standing with all its accrediting bodies.

Student Retention:

The University maintains a comprehensive student retention program under the Vice President for Student Engagement. The program assesses student retention at all levels, including the individual course, major, and degree. During the semester and term, the University's Drop-Out Detective capability, within its Learning Management System (i.e., Canvas), provides an early alert at the course level to potential issues related to retention. Within the Office of Student Life, Academic Advisors monitor Drop-Out Detective and contact students who appear to have problems with their academic performance. The Academic Advisors work with each student to create a plan to remove any barriers to success. The Academic Advisors also work with the course instructors as needed to gain additional insight that may help correct the situation.

Each student also meets with their Academic Advisor each semester to evaluate their progress toward degree completion. An updated plan of action is developed for each student for their next semester's registration and each following semester through degree completion.

The Vice President for Student Engagement also meets regularly with the Vice President of Academic Affairs and the Academic Deans to review student retention within each degree program and address any issues that appear to be impediments to degree completion.

Student and Faculty Satisfaction:

Evaluations and assessment of Student and Faculty satisfaction occur every semester. Faculty members are evaluated every semester by students enrolled in their courses. Students are required to complete a course evaluation online within a specified time frame at the end of the semester for every enrolled course, or they are locked out of Canvas (the University's Learning Management System) until they complete each survey. Every faculty member is also required to review each of their courses after each semester; the goal is to ensure up-to-date content, effective and efficient methods of delivery, and appropriate outcomes.

The Department Chairs and Academic Dean review the student evaluations for every course offered at the University. The Department Chairs and Academic Dean also review faculty satisfaction every semester. If changes are needed at the course level, the changes are developed and implemented by the faculty upon approval of the Department Chairs and Academic Dean. If changes are required at the faculty level, the Department Chairs will make the changes. At the end of the following semester, appropriate stakeholders analyze the results of a follow-on evaluation for the effectiveness of the changes. This cycle is an ongoing process.

Cost Effectiveness:

Based on the year-long inputs, evaluations, and reviews described in Section M.1, the Department Chairs and Academic Dean prepare the proposed academic budget for each program for the upcoming year.

Budget increases are tied to increasing student learning and performance as well as critical strategic initiatives.

The Vice President of Finance and Administration also monitors each academic program throughout every semester and term for its cost-effectiveness. Additionally, the revenue and costs of every University program are reviewed annually by the Executive Council and Board of Trustees before approving the next year's budget.

N. Consistency with the State's Minority Student Achievement goals (as outlined in COMAR 13B.02.03.05 and the State Plan for Post-Secondary Education):

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

Capitol Technology University is a majority-minority school. Our programs attract a diverse set of students who are multiethnic and multicultural. The University actively recruits minority populations for all undergraduate and graduate-level degrees. Special attention is also provided to recruit females into the STEM and multidisciplinary programs at all degree levels--undergraduate, master's, and doctoral. The University will use the same approach for the **Master of Philosophy in Artificial Intelligence** degree.

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.

This program is not associated with a low productivity program identified by the Commission.

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

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

Capitol Technology University is fully eligible to provide distance education. The University has a long history of providing high-quality distance education. The University is accredited regionally by the Middle States Commission in Higher Education (MSCHE) and through four specialized accrediting organizations: International Accreditation Council of Business Education (IACBE), Accreditation Board for Engineering and Technology (ABET), NSA, and DHS. All five accrediting organizations have reviewed the University's distance education program as IACBE, ABET, NSA, and DHS. The University is in good standing with all its accrediting bodies.

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

Capitol Technology University has a long history of providing high-quality distance

education/online learning that complies with the Council of Regional Accrediting Commissions (C-RAC) Interregional Guidelines for the Evaluation of Distance Education. The University will also continue to abide by the C-RAC guidelines with the proposed **Master of Philosophy in Artificial Intelligence** degree.

Council of Regional Accrediting Commissions (C-RAC) Interregional Guidelines for the Evaluation of Distance Education.

a. Online learning is appropriate to the institution's mission and purposes.

Online learning is consistent with the institution's mission, purpose, and history. Please refer to Section A of this proposal.

b. The institution's plans for developing, sustaining, and, if appropriate, expanding online learning offerings are integrated into its regular planning and evaluation processes.

All programs at the University – online, hybrid, and on-ground – are subject to the same regular planning, assessment, and evaluation processes. Please see Section M of this proposal for the detailed process.

c. Online learning is incorporated into the institution's systems of governance and academic oversight.

All programs at the University – online, hybrid, and on-ground – are subject to the same regular planning, assessment, and evaluation processes. Please see Section M of this proposal for the detailed process.

d. Curricula for the institution's online learning offerings are coherent, cohesive, and comparable in academic rigor to programs offered in traditional instructional formats.

Online programs/courses meet the same accreditation standards, goals, objectives, and outcomes as traditional instruction at the University. The online course development process incorporated the Quality Matters research-based set of standards for quality online course design to ensure academic rigor of the online course is comparable to the traditionally offered course. The University Academic Dean, chairs, and faculty review curriculum annually.

Courses are reviewed at the end of each term of course delivery. This process applies to online and traditional classes. In addition, advisory boards are engaged in the monitoring of course quality to ensure quality standards are met regardless of the delivery platform.

e. The institution evaluates the effectiveness of its online learning offerings, including the extent to which the online learning goals are achieved, and uses the results of its evaluations to enhance the attainment of the goals.

Online programs/courses meet the same accreditation standards, goals, objectives, and outcomes as traditional classroom delivery. The University selects the learning platforms to ensure the high standards of the technical elements of each course. The Academic Dean monitor any course conversion from in-class to online to ensure the online course is academically equivalent to the traditionally offered course and that the technology is appropriate to support the expected rigor and breadth of the course.

f. Faculty responsible for delivering the online learning curricula and evaluating the students'

success in achieving the online learning goals are appropriately qualified and effectively supported.

The Graduate School is supported by the Chair of the Department of Computer and Data Science. Other appropriately credentialed faculty with multi-disciplinary level skills will be part of the delivery process. The evaluation of the courses in the program will be done using the same processes as all other programs at the University (Please see Section M). All Capitol Technology University faculty teach in the traditional classroom environment and online. (Please see faculty qualifications in Section I of this document).

g. The institution provides effective student and academic services to support students enrolled in online learning offerings.

Students can receive assistance in using online learning technology via several avenues. Student aides are available to meet with students and provide tutoring support in both subject matter and use of technology. Tutors are available in live real-time sessions using Zoom or other agreed-upon tools. Pre-recorded online tutorials are also available.

In addition to faculty support, on-ground and online tutoring services are available to students in a one-on-one environment.

Laboratories (on ground and virtual) are available for use by all students. Faculty and highly-qualified tutors staff the laboratories and provide academic support.

Library services and resources are appropriate and adequate. Please refer to Section J of this document and the attached letter from the University President. The library adequately supports students' learning needs.

h. The institution provides sufficient resources to support and, if appropriate, expand its online learning offerings.

The University has made the financial commitment to the program (please refer to Section L). The University has a proven record of accomplishment in supporting degree completion.

i. The institution assures the integrity of its online offerings.

Current faculty serve on internal advisory boards that examine curriculum for program changes, including course and program development. All faculty are selected on domain expertise and program-related teaching experience.

When new faculty or outside consultants are necessary for the design of courses offered, the University's Human Resource Department initiates a rigorous search and screening process to identify appropriate faculty to design and teach online courses. Again, all faculty are selected on domain expertise and program-related teaching experience.

The University online platforms offer several avenues to support instructors engaged in online learning. The Director of the Online Learning Division is highly skilled and trained in faculty development. Several seminars and online tutorials are available to the faculty every year. Mentors are assigned to new faculty. Best practice sharing is facilitated through the Academic Dean, Department Chairs, and formal meetings.

The assessment for online learning classes/students is the same as for all academic programs at the University. Faculty provide required data on student achievement. The Learning

Management System includes data on student achievement. Proof of these assessments is available during the class and following class completion to the Academic Dean and Department Chairs. Annually, the information is reported to the University's accreditation authorities such as MSCHE and NSA/DHS.