The Post-Baccalaureate Certificate in Networking Technologies covers the study, design, development, implementation and support of computer-based information systems with regard to sharing information over computer-based systems. This program provides graduate-level education in IT for students preparing to enter the high-tech work force and those already in the work force who wish to update and enhance their skills. This course of study can be completed as a stand-alone graduate certificate or applied to the M.S. degree program in Applied Information Technology. The program is intended for students who have a bachelor’s degree in information technology, computer science, computer information systems or a related field, who will enter the program for advanced studies. The program may also be of interest to persons who:

- Do not have a bachelor’s degree in the field, but are currently employed in the IT field and are seeking additional academic studies for professional growth or to advance their careers
- Have a bachelor’s degree in a discipline other than IT who are seeking preparation for careers in this field

**ADMISSION REQUIREMENTS**

Admission requirements for the post-baccalaureate certificate program are the same as those listed for the M.S. in Applied Information Technology. (http://catalog.towson.edu/graduate/degree-certificate-programs/jess-mildred-fisher-science-mathematics/applied-information-technology-ms)

**Certificate Requirements**

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Units</th>
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<tbody>
<tr>
<td>AIT 600</td>
<td>INFORMATION TECHNOLOGY INFRASTRUCTURE</td>
<td>3</td>
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<tr>
<td>AIT 610</td>
<td>SYSTEMS DEVELOPMENT PROCESS</td>
<td>3</td>
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<td>AIT 620</td>
<td>BUSINESS DATA COMMUNICATIONS</td>
<td>3</td>
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<tr>
<td>AIT 622</td>
<td>NETWORKS ARCHITECTURE AND PROTOCOLS</td>
<td>3</td>
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<tr>
<td>AIT 720</td>
<td>CASE STUDIES IN NETWORKING TECHNOLOGY</td>
<td>3</td>
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Total Units 15

1. Understand the information technology infrastructure and its place and value in today’s business.
2. Work effectively in teams and communicate effectively, both orally and in writing.
3. Use their proficiency to solve a variety of problems.
4. Prepare, present and develop proposals and solutions for today’s governmental and industrial needs.

**Courses**

**AIT 500 FUNDAMENTALS OF COMPUTER PROGRAMMING AND DATA STRUCTURES (6)**
Structured problem solving, algorithm development, fundamentals of computer programming, basic data structures and their implementation, sort and search algorithms, and an introduction to the design and development of information systems. Serves as a preparatory/foundational course for MS in AIT and does not count towards the degree. Prerequisite: Admission to AIT program.

**AIT 600 INFORMATION TECHNOLOGY INFRASTRUCTURE (3)**
A discussion of information systems architectures including software systems, hardware, operating systems, data bases, object-oriented technology, networking and enterprise-wide systems. Prerequisite: Admission to AIT program.

**AIT 610 SYSTEMS DEVELOPMENT PROCESS (3)**
Structured and object-oriented analysis, design and implementation of information systems; distributed information systems; information systems life cycle models, platforms and security. Discussions of requirements definition, modeling quality assurance and development environments. Prerequisite: AIT 600. May take concurrently with AIT 600.

**AIT 612 INFORMATION SYSTEMS VULNERABILITY AND RISK ANALYSIS (3)**
The identification of vulnerabilities and risks inherent in the operation of information systems will be explored. Countermeasures will be discussed and documented in an effort to counter identified vulnerabilities. Prerequisite: AIT 610. May take concurrently with AIT 610.

**AIT 613 INTRODUCTION TO SOFTWARE SECURITY (3)**
A study of security concepts in software. This course discusses design principles for secure software development, and some of the security issues in current applications, database systems, and web systems. It provides the foundation for identifying vulnerabilities, their impact, and solutions to securing them. Prerequisite: AIT 610.

**AIT 614 NETWORK SECURITY (3)**
Network security, hacker attacks, Web security, e-mail security, e-commerce security, systems and operation environment security, database security, algorithms for making data communications secure, encryption and coding techniques and IP security. Prerequisite: AIT 612.

**AIT 616 FUNDAMENTALS OF WEB TECHNOLOGIES AND DEVELOPMENT (3)**
Introduction to HTTP protocol, dynamic HTML and common gateway interface (CGI) programming. Study and practice of object-oriented programming concept using Java. Design and implementation of application software including graphical user interfaces (GUIs), concurrent and distributed programming, distributed information systems server architectures, database connectivity and the enterprise packages provided by the Java programming language. Prerequisite: AIT 610. May take concurrently with AIT 610.

**AIT 618 CLIENT/SERVER-SIDE PROGRAMMING ON THE WEB (3)**
Discussion of HTTP protocol, dynamic HTML, common gateway interface (CGI) programming, Java applets and server-side programming. Development of information systems incorporating applications executing on a client-server system. Design and implementation of distributed information systems involving the technologies developed for the Web. Prerequisite: AIT 616.
A comprehensive survey of software maintenance and testing, design techniques, as well as integration, regression, and system testing principles, methodologies, management strategies, techniques and tools. Software testing at the unit, subsystem levels using various test design techniques, as well as integration, regression, and system testing methods, and software testing tools. Designing and implementing software technologies to increase maintainability and testability, evaluating software for change and validating software changes. Prerequisites: AIT 610, AIT 624/ COSC 612.

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AIT 715 CASE STUDIES IN INTERNET APPLICATIONS (3)
Real-world project dealing with the development of information systems for Internet applications; emphasis on distributed information systems for Web deployment. This is a capstone course for the Internet Application Development certificate. Prerequisites: AIT 616, AIT 618 and consent of AIT graduate program director.

AIT 720 CASE STUDIES IN NETWORKING TECHNOLOGY (3)
Real-world projects dealing with the development, installation, and management of application systems or a variety of networks environment; emphasis is on distributed applications for LAN, WAN, Internet and intranet. This is a capstone course for the Networking Technologies certificate. Prerequisites: AIT 620, AIT 622 and consent of AIT graduate program director.

AIT 725 CASE STUDIES IN SOFTWARE ENGINEERING (3)
Real-world project dealing with design and development of large-scale information systems including applications of theory and techniques in software engineering. This is a capstone course for the Software Engineering certificate. Prerequisites: AIT 624 and AIT 626 and consent of AIT graduate program director.

AIT 730 CASE STUDIES IN INFORMATION SYSTEMS (3)
Real-world projects dealing with issues related to development, management and maintenance of large-scaled information systems; emphasis is on business information systems for a distributed environment. This is a capstone course for the Information Systems Management certificate. Prerequisites: AIT 628, AIT 630 and consent of AIT graduate program director.

AIT 732 ADVANCED DATABASE MANAGEMENT SYSTEMS (3)
Emphasizes advanced topics in database management systems. Topics include: query processing, transaction processing, concurrency and recovery techniques, advanced database models, object-oriented databases, relational databases and Web databases, distributed databases, data warehousing and OLAP. Prerequisite: AIT 632.

AIT 735 CASE STUDIES IN DATABASE MANAGEMENT SYSTEMS (3)
Real-world projects dealing with issues related to development, management and maintenance of large-scaled information systems; emphasis is on the distributed database systems and related security issues. This is a capstone course for the Database Management Systems certificate. Prerequisites: AIT 632, AIT 732 and consent of AIT graduate program director.

AIT 880 GRADUATION PROJECT (3)
Students conduct a study in an advanced IT related topic or undertake the analysis, design and implementation of real-world application. The application may be related to an industrial project sponsored by a company or it may be a mutual interest to the student and the supervising faculty. Prerequisites: Completion of at least 18 units toward M.S. in AIT or COSC.

AIT 885 PROJECT CONTINUUM (1)
Continuation of graduate project. Prerequisite: previous registration for project work.

AIT 895 DOCTORAL INDEPENDENT STUDY (3-6)
Independent guided study for doctoral students to prepare for qualifying exams in preparation for dissertation work. May be repeated up to a total of 9 units. Registration by special permit as authorized by doctoral program director or chair of the department. S/U grading.

AIT 997 DISSERTATION (3-6)
Independent guided research leading to the dissertation. May be repeated up to a total of 24 units. Registration by special permit as authorized by doctoral program director or chair of the department. Graded S/U.

AIT 999 DISSERTATION CONTINUUM (1)
Continuing work toward the completion of the dissertation. Registration by special permit as authorized by doctoral program director or chair of the department.