

Memorandum

Date: 9.19.2022
From: Department of Information Technology and Management
To: Undergraduate Studies Committee
Subject: **Changes to the Bachelor of Information Technology and Management and Bachelor of Science in Applied Cybersecurity and Information Technology Curricula**

All of the following curriculum changes have been approved by Department of Information Technology and Management faculty and, where necessary, the Information Technology and Management Advisory Board. These are all considered to be minor changes and are presented for information purposes.

1. **Changes to Program Objectives and curriculum summaries in the *Undergraduate Bulletin*.** These changes reflect changes to Program Objectives approved by department faculty and the ITM Board, and curriculum changes resulting from changes in ABET Computing Accreditation Commission Accreditation Criteria.

Existing:

The Bachelor of Information Technology and Management degree produces graduates who are able to:

- Problem solve, create, and effectively communicate innovative answers to provide technology solutions for the problems of business, industry, government, non-profit organizations, and individuals
- Perform requirements analysis, design and administration of secure computer and network-based systems conforming to policy and best practices, and monitor and support continuing development of relevant policy and best practices as appropriate
- Apply current industry, technical, and mathematical concepts and practices in the core information technologies and recognize the need to engage in continuing professional development

To meet these goals, graduates must demonstrate knowledge and proficiency in these areas:

- Fundamentals including hardware and operating systems
- Principles and practices for secure computing
- Application development and programming
- Human-computer interaction
- Databases and information management
- Networking
- Web systems and technologies
- System administration and maintenance
- System integration and system architecture
- Professionalism and the local and global impacts of computing

The Bachelor of Science in Applied Cybersecurity and Information Technology degree produces graduates who are able to:

- Problem solve, create, and effectively communicate innovative answers to provide technology solutions for the problems of business, industry, government, non-profit organizations, and individuals
- Perform requirements analysis, design and administration of secure computer and network-based systems conforming to policy and best practices, and monitor and support continuing development of relevant policy and best practices as appropriate
- Design and implement an enterprise security program using policy, technology, and awareness to implement appropriate controls and technically secure enterprise information assets and resources to deter, detect, and prevent the success of attacks and intrusions
- Investigate information security incidents and violation of law using computer resources in a manner such that all evidence is usable for fault analysis and, when applicable, admissible in a court of law
- Apply current industry, technical, and mathematical concepts and practices in the core information technologies and recognize the need to engage in continuing professional development

To meet these goals, in addition to the knowledge and proficiency expected of graduates in Information Technology and Management, cybersecurity graduates must complete 33 hours of coursework in computing and cybersecurity that must cover application of the crosscutting concepts of confidentiality, integrity, availability, risk, and adversarial thinking, as well as fundamental topics from the following areas:

- Information Security
- Software Security
- System Security
- Human Security
- Organizational Security
- Societal Security

Revision (changes are in red):

The Bachelor of Information Technology and Management degree produces graduates who are able to:

- Problem solve and create innovative answers to provide technology solutions for the problems of business, industry, government, non-profit organizations, and individuals
- Perform requirements analysis, design and administration of secure computer and network-based systems conforming to policy and best practices, and monitor and support continuing development of relevant policy and best practices as appropriate
- Apply current industry, technical, and mathematical concepts and practices in the core information technologies and recognize the need to engage in continuing professional development

To meet these goals, graduates must demonstrate knowledge and proficiency in these areas:

- Techniques, skills, and tools necessary for computing practice.
- Principles and practices for secure computing.
- Local and global impacts of computing solutions on individuals, organizations, and society.
- Fundamentals and applied practice in
 - information management
 - integrated systems
 - platform technologies
 - system paradigms
 - user experience design
 - networking
 - software development and management
 - web and mobile systems
- Advanced and supplemental IT topics that build on fundamentals and applied practice to provide depth
- Principles and practices of IT project management

The Bachelor of Science in Applied Cybersecurity and Information Technology degree produces graduates who are able to:

- Problem solve and create innovative answers to provide technology solutions for the problems of business, industry, government, non-profit organizations, and individuals
- Perform requirements analysis, design and administration of secure computer and network-based systems conforming to policy and best practices, and monitor and support continuing development of relevant policy and best practices as appropriate
- Apply current industry, technical, and mathematical concepts and practices in the core information technologies and recognize the need to engage in continuing professional development
- Design and implement an enterprise security program using policy, technology, and awareness to implement appropriate controls and technically secure enterprise information assets and resources to deter, detect, and prevent the success of attacks and intrusions
- Investigate information security incidents and violation of law using computer resources in a manner such that all evidence is usable for fault analysis and, when applicable, admissible in a court of law

To meet these goals, in addition to the knowledge and proficiency expected of graduates in Information Technology and Management, cybersecurity graduates must complete 33 hours of coursework in computing and cybersecurity that must cover application of the crosscutting concepts of confidentiality, integrity, availability, risk, and adversarial thinking, as well as fundamental and advanced topics from the following areas:

- Data Security: protection of data at rest, during processing, and in transit
- Software Security: development and use of software that reliably preserves the security properties of the protected information and systems
- Component Security: the security aspects of the design, procurement, testing, analysis, and maintenance of components integrated into larger systems
- Connection Security: security of the connections between components, both physical and logical
- System Security: security aspects of systems that use software and are composed of components and connections
- Human Security: the study of human behavior in the context of data protection, privacy, and threat mitigation
- Organizational Security: protecting organizations from cybersecurity threats and managing risk to support successful accomplishment of the organizations' missions
- Societal Security: aspects of cybersecurity that broadly impact society as a whole

2. **Discontinue and delete the Minor in System Administration.** This minor is duplicative of the Minor in Information System Administration. It is also incomplete as it does not include necessary prerequisites found in the Minor in Information System Administration.

3. **Replace the existing Information Technology Curriculum Specialization in Web Design and Application Development with new courses.** The courses in the Information Technology and Management web development curriculum have been replaced with new courses, resulting in a redesign of this curriculum specialization. In addition, all occurrences of ITMD 465 Rich Internet Applications in other Curriculum Specializations will be replaced by ITMD 441 Web Application Foundations. All Curriculum Specializations in the Bachelor of Information Technology and Management are **optional** and are defined by the selection of four of the six major electives.

Existing Curriculum Specialization:

Web Design and Application Development

Focuses on the design and development of fully-interactive websites and applications for Internet deployment.

Code	Title	Credit Hours
ITMO 441	Network Admin & Operations	3
ITMD 462	Web Site App Development	3
Select two courses from the following;		6
ITMO 444	Cloud Computing Technologies	3
ITMD 453	Enterprise Intelligent Device	3
ITMD 454	Mass-Market Intelligent Device	3
ITMD 455	Open-Source Intelligent Device	3
ITMD 463	Intermediate Web App Develop	3
ITMD 464	Adv Web Appl Devlpmnt	3
ITMD 465	Rich Internet Applications	3
ITMD 466	Service-Oriented Architectures	3
ITMD 467	Web Systems Integration	3
ITMD 469	Topics in Application Develop	3
Total Credit Hours		12

Revised Curriculum Specialization:

(changes in red)

Web Design and Application Development

Focuses on the design and development of fully-interactive websites and applications for Internet deployment.

Code	Title	Credit Hours
ITMD 441	Web Application Foundations	3
ITMD 442	Full-Stack Web Development	3
Select two courses from the following;		6
ITMD 443	Front-End Web Development	3
ITMD 444	Back-End Web Development	3
ITMD 445	Web Real-Time Communications	3
ITMD 446	Web Microservices and APIs	3
ITMD 447	Web Systems Integration	3
ITMD 449	Topics in Web Development	3
ITMD 466	Service-Oriented Architectures	3
Total Credit Hours		12

(Note: ITMO 441 Network Admin & Operations and ITMO 444 Cloud Computing Technologies can still be taken as elective courses.)

4. **Retire and remove existing ITMD 46X web development courses.** These courses, ITMD 462 Web Site Application Development, ITMD 463 Intermediate Web Application Development, ITMD 464 Advanced Web Application Development and ITMD 465 Rich Internet Applications have been replaced by ITMD 441, ITMD 442, ITMD 443, ITMD 444, ITMD 445, and ITMD 446. The existing course ITMD 467 Web Systems Integration will be renumbered to ITMD 447.