

2.1.2023

From: Department of Information Technology and Management

To: Undergraduate Studies Committee

## Proposed Changes to the Bachelor of Information Technology and Management and Bachelor of Science in Applied Cybersecurity and Information Technology Degrees

The following changes are proposed to the Bachelor of Information Technology and Management (BITM) and the Bachelor of Science in Applied Cybersecurity and Information Technology (BSACIT) degrees.

1. Add an additional required course, **ITM 303 Introduction to Hardware and Operating Systems II**, to reflect changes in necessary and expected levels of introductory material in the discipline. This course will normally be taken in the second semester of studies.
2. Replace **ITM 100 Introduction to Information Technology as a Profession** with **ITMT 330 Introduction to Information Systems and IT as a Profession** as the department's Introduction to the Profession (ITP) course. This course number better reflects both the role and the position of this course, as it is already taught in the third semester of the program. The ITMT 330 course description is unchanged from ITM 100 and curricular changes are minimal. Expanded coverage of some introductory material in the discipline in ITM 303 will actually allow additional time to focus on professional development in ITMT 330.
3. In the Bachelor of Information Technology and Management, change the Web Development Specialization to reflect a new course sequence of redesigned courses that better reflect current web development practices. Specializations in this degree are *optional*.
4. Restructure the Plan of Study for each degree to accommodate the newly added ITM 303 course and to better reflect current advising practices in the department.

These changes remove three hours of free elective credit, bringing the free electives to nine hours for the Bachelor of Information Technology and Management and three hours for the Bachelor of Science in Applied Cybersecurity and Information Technology. This does not change the number of hours in either degree, nor will this along with changes made over the last 5 years exceed 25%. Consequently, this proposal constitutes a MINOR CHANGE to both degrees.

All changes have been unanimously approved by the faculty of the Department of Information Technology and Management. All new courses have been approved and are active in the system. All changes have been entered in CIM and applicable excerpts from CIM for each degree follows, as well as the syllabi for ITM 303 and ITMT 330.



Ray Trygstad

## Bachelor of Information Technology and Management Required Courses

CODE	TITLE	CREDIT HOURS
<b>ITM Requirements</b>		<b>(42)</b>
ITM 100	Intro to IT as a Profession	3
ITM 301	Intro OS and Hardware I	3
ITM 303	Intro to OS and Hardware II	3
ITM 311	Intro to Software Development	3
ITM 313	Intro to Open Source App Dev	3
or ITM 312	Intro Systems Sftwr Prgmng	
ITMD 321	Data Modeling and Applications	3
ITMD 361	Fund of Web Development	3
ITMD 362	Human-Computer Interaction	3
ITMD 411	Intermediate Software Devlpmnt	3
ITMM 471	Project Management for ITM	3
ITMO 340	Intro Data Networks & Internet	3
ITMO 356	Intro Open Source OS	3
ITMS 448	Cyber Security Technologies	3
ITMT 330	Intro to Info Systems and IT	3
ITMT 430	System Integration	3
<b>ITM Electives</b>		<b>(18)</b>
Select 18 credit hours from ITM, ITMD, ITMM, ITMO, ITMS, ITMT, and TECH		18
<b>Mathematics Requirements</b>		<b>(6)</b>
MATH 180	Fundamentals of Discrete Math	3
or MATH 230	Introduction to Discrete Math	
Select one course from the following:		3
BUS 221	Business Statistics	3
PSYC 203	Undergrad Stats Bhvrl Sci	4
MATH 225	Introductory Statistics	3
MATH 425	Statistical Methods	3
<b>Natural Science and Engineering Requirements</b>		<b>(10)</b>
EG 225 is recommended		
See Illinois Tech Core Curriculum, section D		10
<b>Humanities and Social Sciences Requirements</b>		<b>(21)</b>
PSYC 301 is recommended		
See Illinois Tech Core Curriculum, sections B and C		21
<b>Interprofessional Projects (IPRO)</b>		<b>(6)</b>
See Illinois Tech Core Curriculum, section E		6
<b>Minor Electives</b>		<b>(15)</b>
Select 15 credit hours		15
<b>Free Electives</b>		<b>(9)</b>
<del>Select 12 credit hours</del>		<del>12</del>
Select 9 credit hours		9
<b>Total Credit Hours</b>		<b>127</b>

### Bachelor of Information Technology and Management 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
ITMD 441	Web App 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 Communication	3
ITMD 446	Web Microservices and APIs	3
ITMD 447	Web Systems Integration	3
ITMD 449	Topics in Web Development	1-3
ITMD 466	Service-Oriented Architectures	3
<b>Total Credit Hours</b>		<b>12</b>

# Bachelor of Information Technology and Management (Program for First-Year Students) Curriculum

## YEAR 1

SEMESTER 1	CREDIT HOURS	SEMESTER 2	CREDIT HOURS
ITM 301	3	ITM 303	3
ITM 311	3	ITM 313	3
Natural Science or Engineering Elective	4	ITMO 356	3
Humanities 200-level Elective	3	MATH 180 or 230	3
		Natural Science or Engineering Elective	3
	<b>13</b>		<b>15</b>

## YEAR 2

SEMESTER 1	CREDIT HOURS	SEMESTER 2	CREDIT HOURS
ITMD 321	3	ITMD 362	3
ITMD 361	3	ITMD 411	3
ITMT 330	3	ITMO 340	3
Natural Science or Engineering Elective	3	Statistics Elective (MATH 425, BUS 221, PSYC 203)	3
Social Science Elective	3	Social Sciences Elective (300+)	3
		Minor Elective	3
	<b>15</b>		<b>18</b>

## YEAR 3

SEMESTER 1	CREDIT HOURS	SEMESTER 2	CREDIT HOURS
ITMM 471	3	ITM Elective	3
ITMS 448	3	ITM Elective	3
ITM Elective	3	I PRO Elective I	3
Humanities Elective (300+)	3	Social Sciences Elective (300+)	3
Minor Elective	3	Minor Elective	3
Free Elective	3	Free Elective	3
	<b>18</b>		<b>18</b>

## YEAR 4

SEMESTER 1	CREDIT HOURS	SEMESTER 2	CREDIT HOURS
ITM Elective	3	ITMT 430	3
ITM Elective	3	ITM Elective	3
Minor Elective	3	I PRO Elective II	3
Humanities Elective (300+)	3	Minor Elective	3
Free Elective	3	Humanities or Social Sciences Elective	3
	<b>15</b>		<b>15</b>

**Total Credit Hours: 127**

# Bachelor of Science in Applied Cybersecurity and Information Technology Required Courses

CODE	TITLE	CREDIT HOURS
<b>Information Technology Core Requirements</b>		<b>(36)</b>
<del>ITM 100</del>	<del>Intro to IT as a Profession</del>	<del>3</del>
ITM 301	Intro OS and Hardware I	3
ITM 303	Intro to OS and Hardware II	3
ITM 311	Intro to Software Development	3
ITM 313	Intro to Open Source App Dev	3
or ITM 312	Intro Systems Sftwr Prgmng	
ITMD 321	Data Modeling and Applications	3
ITMD 361	Fund of Web Development	3
ITMD 362	Human-Computer Interaction	3
ITMD 411	Intermediate Software Devlpmnt	3
ITMM 471	Project Management for ITM	3
ITMO 340	Intro Data Networks & Internet	3
ITMO 356	Intro Open Source OS	3
ITMT 330	Intro to Info Systems and IT	3
<b>Cybersecurity Core Requirements</b>		<b>(27)</b>
ITMM 485	Legal and Ethical Issues in IT	3
ITMS 418	Coding Security	3
ITMS 438	Cyber Forensics	3
ITMS 443	Vulnerability Anlys and Ctrl	3
ITMS 448	Cyber Security Technologies	3
ITMS 458	Operating System Security	3
ITMS 478	Cyber Security Management	3
ITMS 483	Digital Evidence	3
ITMT 430	System Integration	3
<b>Cybersecurity and Information Technology Electives</b>		<b>(6)</b>
Select six credit hours from ITM, ITMD, ITMM, ITMO, ITMS, ITMT, or TECH courses		6
<b>Mathematics Requirements</b>		<b>(20)</b>
MATH 151	Calculus I	5
MATH 152	Calculus II	5
MATH 230	Introduction to Discrete Math	3
MATH 251	Multivariate & Vector Calculus	4
MATH 474	Probability and Statistics	3
<b>Natural Science and Engineering Requirements</b>		<b>(10)</b>
EG 225 and PHYS 200 are recommended		
See Illinois Tech Core Curriculum, section D		10
<b>Humanities and Social Sciences Requirements</b>		<b>(21)</b>
PSYC 301 is recommended		
See Illinois Tech Core Curriculum, sections B and C		21
<b>Interprofessional Projects (IPRO)</b>		<b>(6)</b>
See Illinois Tech Core Curriculum, section E		6
<b>Free Electives</b>		<b>(3)</b>
<del>Select six credit hours</del>		<del>6</del>
Select three credit hours		3
<b>Total Credit Hours</b>		<b>129</b>

# Bachelor of Science in Applied Cybersecurity and Information Technology Curriculum

## YEAR 1

SEMESTER 1	CREDIT HOURS	SEMESTER 2	CREDIT HOURS
ITM 301	3	ITM 303	3
ITM 311	3	ITM 313	3
MATH 151	5	MATH 152	5
Humanities 200-level Elective	3	Natural Science or Engineering Elective	3
	<b>14</b>		<b>17</b>

## YEAR 2

SEMESTER 1	CREDIT HOURS	SEMESTER 2	CREDIT HOURS
ITMD 361	3	ITMD 362	3
ITMD 411	3	ITMD 411	3
ITMT 330	3	ITMO 340	3
MATH 251	4	ITMS 478	3
Natural Science or Engineering Elective	4	MATH 230	3
		Natural Science or Engineering Elective	3
	<b>17</b>		<b>18</b>

## YEAR 3

SEMESTER 1	CREDIT HOURS	SEMESTER 2	CREDIT HOURS
ITMD 321	3	ITMS 418	3
ITMM 471	3	ITMS 438	3
ITMS 443	3	ITMM 485	3
ITMS 448	3	MATH 474	3
Humanities Elective (300+)	3	IPro Elective I	3
Social Sciences Elective (300+)	3		
	<b>18</b>		<b>15</b>

## YEAR 4

SEMESTER 1	CREDIT HOURS	SEMESTER 2	CREDIT HOURS
ITMS 483	3	ITMT 430	3
ITMS 458	3	Cybersecurity Elective	3
Cybersecurity Elective	3	IPro Elective II	3
Humanities Elective (300+)	3	Social Sciences Elective (300+)	3
Free Elective	3	Humanities or Social Sciences Elective	3
	<b>15</b>		<b>15</b>

**Total Credit Hours: 129**

## ITM 303 SYLLABUS

### ITM 303 Introduction to Contemporary Operating Systems and Hardware II

Hours: 3 credit hours / 60 contact hours; 30 hours  
lecture, 30 hours lab

Instructor: Vasilios "Billy" Pappademetriou

#### Textbook, title, author, and year:

*The Official CompTIA A+ Core 2 Student Guide (Exam 220-1102)*, Pam Taylor and James Pengelly, 2019

#### Specific course information

- a. **Catalog description:** Introduces features of an advanced operating system, including basic commands, file and directory manipulation, security, and suitability for server applications. Popular and business-focused desktop and mobile device operating systems will be examined, as well as enterprise and open-source server implementations.
- b. **Prerequisites:** ITM 301
- c. **Optional.**

#### Specific goals for the course

- a. **Program Educational Objectives**
  1. Problem solve and create innovative answers to provide technology solutions for the problems of business, industry, government, non-profit organizations, and individuals.
- b. **Course Outcomes:**  
ITM302 is a foundation course in the basics of computer, device, and server operating system. This serves as a basis for practical studies in other topics in IT. Upon completion, a student should be able to understand, use, and manage industry-standard operating systems.
- c. **Course student outcomes:**  
Upon completion of this course the student should be able to do the following
  - Operating Systems
    - Compare and contrast common operating systems and their purposes.
    - Compare and contrast features of Microsoft Windows versions.
    - Summarize general OS installation considerations and upgrade methods.
    - Use appropriate Microsoft command line & GUI tools, features and Control Panel utilities.
    - Install and configure applications.
    - Configure Microsoft Windows networking on a client/desktop system.
    - Use features and tools of Mac OS and Linux client/desktop operating systems.
  - Security
    - Summarize the importance of physical security measures.
    - Explain logical security concepts.

- Compare and contrast wireless security protocols and authentication methods.
- Detect, remove, and prevent malware using appropriate tools and methods.
- Compare and contrast social engineering, threats, and vulnerabilities.
- Compare and contrast the differences in basic Microsoft Windows OS security settings
- Implement security best practices to secure a workstation, mobile device, SOHO wired or wireless devices.
- Implement appropriate data destruction and disposal methods.
- Software Troubleshooting
  - Troubleshoot:
    - Microsoft Windows OS.
    - and resolve PC Security issues.
    - Mobile OS and Application issues.
    - Mobile OS and Application Security Issues.
  - Use best practices for malware removal.
- Operational Procedures
  - Compare and contrast best practices associated with types of documentation.
  - Implement:
    - Change management best practices.
    - Basic disaster prevention and recovery methods.
  - Explain:
    - Common safety procedures/practices.
    - Environmental impacts and appropriate controls.
  - Describe processes for addressing prohibited content/activity, and privacy, licensing, and policy concepts.
  - Use proper communication techniques and professionalism.
  - Identify the basics of scripting.
  - Use remote access technologies.
- Design, implement, and evaluate a computing-based solution to meet a given set of computing requirements in the context of the program's discipline  
**(ABET Computing Criterion 3.2)**

#### Topics to be covered

- a. Introduction. IIT Banner, Class basics
- b. Book and Lab setup
- c. Lab - Virtual Machine Lab
- d. Support Operating Systems
- e. Install, Configure, and Maintain an OS
- f. Maintain and Troubleshoot MS Windows
- g. Configure and Troubleshoot Networks
- h. Open Topic/Midterm
- i. Manage Users, Workstations & Shared Resources
- j. Security Concepts
- k. Secure Workstation and Data
- l. Troubleshoot Workstation Security Issues
- m. Support and Troubleshoot Mobile Devices
- n. Implement Operational Procedures

## ITMT 330 SYLLABUS

### ITMT 330 Introduction to Information System sand the IT Profession (Formerly ITM 100)

Hours: 3 credit hours / 45 contact hours

Instructor: Ray Trygstad

#### Textbook, title, author, and year

- a. *Information Systems for Business* Pham, Ly-Huong T.; Desai-Naik, Tejal; Hammond, Laurie; & Abdeljabbar, Wael 2021
- b. *Business Processes & Information Technology* Gelinias, Ulric J. Jr.; Sutton, Steve G.; Federowicz, Jane 2008
- c. *Information Technology for Management* Lucas, Henry C. Jr. 2009
- d. *Introduction to information systems—16th ed.* Marakas, George M. & O'Brien, James 2013
- e. *Information Systems* Watson, Richard T. (Ed.) 2007
- f. Supplemental Materials: Online readings as assigned in Blackboard

#### Specific course information

- a. **Catalog description:** Introduces students to concepts of systems, systems theory and modeling, information systems, and system integration. Examines the steps necessary to analyze a business problem and identify and define the computing and information requirements appropriate to its solution, with a focus on how to design, implement, and evaluate a technology-based system to meet desired needs. Students learn to analyze the local and global impact of computing on individuals, organizations, and society. Leads students to recognize of the need for continuing professional development, and imparts an understanding of professional, ethical, legal, security and social issues and responsibilities in information technology. Students write and present, building their ability to communicate effectively with a range of audiences, and using standard planning methodologies design an information system to meet the information needs of a small business. This course meets the university Introduction to the Profession Core Course requirement.
- b. **Prerequisites:** ITM 301 and (ITM 311 or ITM 312 or ITM313 or CS 116 or CS 201)
- c. **Required.**

#### Specific goals for the course

- a. **Program Educational Outcome:**
  3. Apply current technical and mathematical concepts and practices in the core information technologies and recognize the need to engage in continuing professional development.
- b. **Course Outcomes:** Each successful student will be able to use concepts of systems theory, systems modeling, and system integration to design an information system using standard planning methodologies to meet identified business needs. They will be able to analyze the local and global impact of computing on individuals, organizations, and society, engage in continuing professional development, and discuss professional, ethical, legal, security & social issues and responsibilities.

#### c. Course student outcomes:

Upon completion of this course the student should be able to do the following:

- Recall and describe concepts of system theory and system modeling
- Outline and describe the components of an information system
- Explain the role of information technology as the facilitating function in a modern business enterprise
- Discuss considerations for deployment of technology in a business setting
- Explain the standards of professional communication used within the information technology profession
  - Communicate (understand, and respond) in a manner appropriate to the profession
- Analyze a business problem and identify and define computing requirements appropriate to its solution
- Design a computer-based information system to meet desired business needs
- Describe concepts of system integration and its application to information system design
- Recognize professional responsibilities and make informed judgments in computing practice based on legal and ethical principles (**ABET Computing Criterion 3.4**)
  - Explain the importance of ethics to the information technology profession
    - Be able to recognize ethical issues and propose appropriate responses to ethical problems
  - Describe the norms of professional behavior as an information technology professional
    - Discuss how professional conduct reflects on and supports the information technology profession
  - Recognize the need for and engage in continuing professional development
- Function effectively as a member or leader of a team engaged in the design and development of information technology solutions to business problems (**ABET Computing Criterion 3.5**)

#### Topics to be covered

- a. Introduction to Systems & Systems Theory
- b. System Modeling Concepts and Methods
- c. Introduction to Information Systems
- d. Data, Information, and Data Management
- e. Communicating Technology & Project Management
- f. Professionalism as an Information Technology and/or Cybersecurity Professional
- g. Information in the Enterprise
- h. Systems Analysis & Requirements Definition
- i. Systems Design and Implementation
- j. Integrating Systems
- k. Information in Society and the World
- l. Ethics and Professional Responsibility
- m. Legal and Security Responsibility