

Table of Contents

Information Technology..... 1

Information Technology

Information Technology (ITEC) is a baccalaureate degree major designed to prepare students for careers in a wide variety of work settings that rely on information technologies to accomplish organizational goals. ITEC is a great fit for students who enjoy using computing technology to provide solutions to issues facing individuals, organizations, and societies. ITEC is distinct from computer engineering, computer science, and management information systems because it focuses on meeting the needs of users within organizational and societal contexts through the selection, creation, application, integration and administration of computing technologies.

The ITEC curriculum is based on the latest version of the nationally recognized ACM/IEEE IT Computing Curricula for undergraduate information technology degree programs. The curriculum recognizes that graduates must have good computing skills as well as an understanding of the principles and fundamentals of IT, including programming, networking, human computer interaction, databases, web systems, and cybersecurity. Many courses require significant hands-on computer activities. Students also choose a number of elective courses to reflect their personal interests in IT professional careers.

An online delivery option for place-bound or working students to complete a Bachelor of Science degree or a minor in ITEC is available. The same curriculum requirements apply to both residential and online students.

Program Educational Objectives

The Information Technology program at Southern Illinois University Carbondale prepares students to:

1. Assume professional roles in IT-related positions or advance in graduate studies.
2. Evaluate and apply best practices in IT environments.
3. Collaborate and communicate effectively in diverse team environments.
4. Perform duties with integrity and integrate proper ethical considerations.

Student Outcomes

1. Analyze a complex computing problem and to apply principles of computing and other relevant disciplines to identify solutions.
2. Design, implement, and evaluate a computing-based solution to meet a given set of computing requirements in the context of the program's discipline.
3. Communicate effectively in a variety of professional contexts.
4. Recognize professional responsibilities and make informed judgments in computing practice based on legal and ethical principles.
5. Function effectively as a member or leader of a team engaged in activities appropriate to the program's discipline.
6. Use systemic approaches to select, develop, apply, integrate, and administer secure computing technologies to accomplish user goals.

Bachelor of Science (B.S.) in Information Technology

Degree Requirements	Credit Hours
University Core Curriculum Requirements ¹	39

Degree Requirements	Credit Hours
Require MATH 106 or MATH 108. Recommend PHIL 104 or PHIL 105, and ECON 113, PSYC 102 or SOC 108	
Foundation Course Requirements - ITEC 209, ITEC 216, ITEC 224, ITEC 225, ITEC 235, ITEC 236, ITEC 265, ITEC 280 ²	24
Requirements for Major in Information Technology	42
Required Major Courses - ITEC 312, ITEC 314, ITEC 334, ITEC 370, ITEC 380, ITEC 390, ITEC 404, ITEC 412, ITEC 495	27
Approved Major Electives (Note: 15 hours must be at the 300- or 400-level) ³	15
Additional Electives	15
Total	120

¹ Students may meet these requirements through an approved AA/AS degree from an accredited community college.

² Students may meet these requirements through an articulated approved AA/AS degree from an accredited community college.

³ Students may choose any combination of major electives or focus their interest in one of the following areas: cybersecurity, network and system administration, web and mobile app development, applied data analytics.

Information Technology Minor

The minor in Information Technology (ITEC) is offered to meet the demands of the 21st century workplace. The ITEC minor introduces students to the study of information technology principles and skills and is an excellent complement to any degree program, regardless of major.

The ITEC minor requires 18 credit hours that consists of two required and four elective courses. The courses required to complete this minor include ITEC 209 and ITEC 216. At least six credit hours must be at the 300-level or higher. ITEC 229, ITEC 265, and ITEC 280 do not count toward the minor. All prerequisites for these courses must be fulfilled prior to enrollment in each course. All courses for this minor must be completed with a grade of C or better.

Capstone Option for Transfer Students

The Capstone Option is available to qualified students entering the ITEC degree program. More information about the Capstone Option can be found within the University Core Curriculum tab of the Undergraduate Catalog. The ITEC degree program has signed Program Articulation Agreements with several community college computing-related degree programs in order to facilitate the transfer of community college students to SIU. These agreements take full advantage of the Capstone Option for admission to the Bachelor of Science in Information Technology.

Information Technology Courses

ITEC113 - Information Assurance for Everyone This course is designed to give all students, especially those without a technical or computing background, an introduction to the concerns and issues associated with computers, social networks, and the Internet. Students will learn about the motivation of cyber criminals, common tricks and tactics used by them, and methods of defending against them. At the end of the course, students will have the knowledge necessary to more safely and securely use modern communication technologies and students will learn about basic ethical and legal issues of computing, consequences of insecurity for individuals and organizations, and leave the course with a broad understanding of the basics and topics of information security and assurance. Credit Hours: 3

ITEC209 - Introduction to Programming This course is an introduction to computer programming, logic, design and implementation. Topics include software design, documentation, coding methods, data types, data structures, functions, subroutines and program control structures. A grade of C or better is required. Credit Hours: 3

ITEC216 - Information Security Fundamentals This course provides students in technical programs with an introduction to a broad range of information security concepts. The following topics are covered: networks security, compliance and operational security, threats and vulnerabilities, application, data and host security, access control and identity management, and cryptography. Lecture and laboratory. A grade of C or better is required. Credit Hours: 3

ITEC224 - Network Fundamentals This course takes a lab/lecture approach which leads the student through a series of activities involved in the installation of a local area network (LAN) capable of sharing information and a variety of electronic input/output devices. The student will be introduced to various LAN designs, communication protocols, network certification requirements, as well as procedures for selecting, installing, and managing a LAN. Lecture and laboratory. A grade of C or better is required. Credit Hours: 3

ITEC225 - Operating Systems This course introduces Linux and Windows operating systems and presents topics related to selection, installation, configuration, maintenance, server administration and management, client and server services, user and group management and support, security management, backup management and disaster recovery, resource management, and automation management. A grade of C or better is required. Prerequisite: ITEC 209. Credit Hours: 3

ITEC227 - Linux Essentials Students will learn to use Linux operating systems in this course. Intermediate computing skills are required, but previous experiences to Linux is not necessary. From the foundations of the open source philosophy to advanced command line activities, this course teaches the skills and knowledge needed for the Linux Essentials certification exam. Topics include selecting a Linux distribution, installing applications, operating system security, and basic shell scripting to automate tasks. Lecture and lab. A grade of C or better is required. Credit Hours: 3

ITEC228 - Introduction to Cyber Operations Students will explore the realm of "ethical hacking", learning the methodology of examining how to successfully evaluate vulnerabilities of various types of computing systems, use tools to exploit those vulnerabilities, and then make plans and execute those plans to prevent further security exploitation. Exploration of open source security assessment tools as well as Microsoft, Linux, and Internet of Things systems will be examined. Applied exercises with common ethical hacking toolkits will be a primary focus. A grade of C or better is required. Prerequisites: ITEC 216 and ITEC 224 each with a grade of C or better. Credit Hours: 3

ITEC229 - Computing for Business Administration The successful student will acquire an understanding of information systems concepts and of the use of computers to process business data through solving a variety of business related problems. Emphasis on the computer as a management tool. Lecture one hour, lab two hours. A grade of C or better. Credit Hours: 3

ITEC235 - System Administration This course provides an in-depth look at Linux and Windows system administration. Students will develop a mastery of core system administration tasks on Red Hat Enterprise Linux and Windows. A grade of C or better is required. Prerequisite: ITEC 224 with a grade of C or better. Recommend enrollment in ITEC 225. Credit Hours: 3

ITEC236 - Web-based Applications in Information Technology This course is designed to provide students with skills on the fundamentals of client-side web development languages to build professional

websites, such as HyperText Markup Language (HTML), Cascading Style Sheets (CSS) and JavaScript. The course introduces Web standards, Web Design principles, and Web Design and Development tools. Hands-on assignments will provide students with practical experience developing interactive Web pages and websites using client-side technologies. Lecture and laboratory. A grade of C or better is required. Prerequisite: ITEC 209 with a grade of C or better. Credit Hours: 3

ITEC259 - Occupational Education Credit A designation for credit granted for occupational educational experiences related to the student's educational objectives. Credit will be established by program evaluation. This credit may be applied only at the 100 and 200 level unless otherwise determined by the school's director. Restricted to Information Technology majors. Credit Hours: 1-60

ITEC265 - Applied Statistics for the IT Profession This course will give students an understanding of the basic principles and techniques involved in the statistical treatment of data, including the selection of data sources, the design of statistical studies, and the analysis, synthesis, and utilization of data. Students will gain experience in using data for decision-making in their respective professions. ITEC majors must earn a grade of C or better. Prerequisite: MATH 106 or MATH 108 with a grade of C or better. Credit Hours: 3

ITEC280 - Discrete Math for IT This course examines selected topics of discrete mathematics as applicable to students of information technology and systems. Topics include basic logic, functions, relations, and sets, graphs and trees, application of mathematics to IT, and other topics. A grade of C or better is required. Prerequisite: MATH 106 or MATH 108. Credit Hours: 3

ITEC295 - Introduction to Cyber Defense Competition This course will introduce students to cyber defense competitions. Students will gain preparatory skills required for cyber defense competitions while working alongside more advanced students. Students who complete this course will be equipped to advance into ITEC 395 which prepares students for competitions and similar forums. A grade of C or better is required. Prerequisites: ITEC 209, ITEC 216, ITEC 224, ITEC 228 and ITEC 235 each with a grade of C or better or concurrent enrollment in ITEC 228 and ITEC 235 or consent of instructor. Credit Hours: 3

ITEC299 - Individual Study Provides students with the opportunity to develop a special program of studies to fit a particular need not met by other offerings. Enrollment provides access to the resources of facilities of the entire institution. Each student will work under the supervision of a sponsoring staff member. A grade of C or better is required. Special approval needed from the instructor. Credit Hours: 1-16

ITEC306 - Android Application Development Students will be introduced to concepts, models, and methodologies for developing applications that run on the Android platform. Students will gain hands-on experience creating and deploying mobile applications for Android devices. The course will explore features such as networking, web services, cloud computing, location services, phone sensors, media, data persistence, speech recognition, and animation. A grade of C or better is required. Prerequisite: ITEC 209 with a grade of C or better. Credit Hours: 3

ITEC312 - Programming II This course is designed to enable the student to use advanced programming techniques in the design and development of software applications. Topics will include object-oriented programming, classes, data manipulation, inheritance, polymorphism, exception handling, and recursion. A grade of C or better is required. Prerequisite: ITEC 209 with a grade of C or better. Credit Hours: 3

ITEC314 - Ethical and Legal Issues in IT This course deals with the impact of computers on us as individuals and on our society. Rapid changes in computing technology and in our use of that technology have changed the way we work, play, and interact with other people. These changes have created a flood of new ethical and legal issues that demand critical examination. A grade of C or better is required. Restricted to ITEC major. Credit Hours: 3

ITEC334 - Database Design and Processing This course is designed to provide students with essential knowledge and pragmatic skills of databases design and processing. Essential topics include database development life cycle, conceptual data modeling, logical database design and normalization, and query languages. For hands-on learning, this course focuses on the use of relational database management

systems to construct database system objects, such as tables, queries, and SQL code. Lecture and laboratory. A grade of C or better is required. Credit Hours: 3

ITEC340 - Introduction to Video Game Design and Industry Introduction to electronic video game development, processes, and game development careers. This course includes an examination of the history of video games, genres and platforms, the game development process with an emphasis on design elements, audio for games, game industry teams and careers, and managerial roles in the game development and publishing industry. A grade of C or better is required. Credit Hours: 3

ITEC342 - Foundations and Applications of IoT This course will explore common platforms that Internet of Things devices are built on. Projects will be completed and IoT systems will be implemented to solve problems in both business and consumer environments. The security of the IoT including weaknesses and strategies for remediating are a focus. Students will become familiar with basic electronic fundamentals in order to construct IoT projects. A grade of C or better required. Prerequisite: ITEC 209 with a grade of C or better. Course fee: \$50. Credit Hours: 3

ITEC343 - IoT OS Platforms The selection, configuration, installation, maintenance, and troubleshooting of industrial peer-to-peer and device level networks will be examined with the purpose of forming a complete industrial control network structure. The integration of various industrial control devices, components, and automation cells to form a complete automated control system will be examined. Safety and standard practices will be emphasized throughout the course. Students will be required to purchase a microcontroller system ranging in cost between \$100-130. Lecture and Laboratory. A grade of C or better is required. Prerequisite: ITEC 227 or ITEC 327 with a grade of C or better. Credit Hours: 3

ITEC350 - Technical Career Subjects In-depth competency and skill development and exploration of innovative techniques and procedures used in business, industry, professions and service occupations offered through various workshops, special courses and seminars. Hours and credit to be individually arranged. Course may be classified as independent study. A grade of C or better is required. Special approval needed from the advisor. Credit Hours: 1-32

ITEC351 - Readings Selected readings in specific IT topics not ordinarily covered in depth in other courses. Special approval needed from the instructor. A grade of C or better is required. Credit Hours: 1-6

ITEC358 - Work Experience Credit Credit will be granted via program evaluation of prior job skills, management-worker relations, and supervisory experience while employed in industry, business, the professions or service occupations. Credit will be established by School Director evaluation. Credit Hours: 1-30

ITEC366 - Applications of Technical Communication The course will increase students' competencies in writing, analyzing, utilizing, and communicating various types of technical information. Emphasis will be placed on formal report writing, business writing, collaboration, user documentation, instructions, visual technical communications, and oral presentations. A grade of C or better is required. Prerequisite: ENGL 101 with a grade of C or better. Credit Hours: 3

ITEC370 - Database Programming with SQL This course is designed to provide students with pragmatic skills of database programming with Structured Query Language (SQL). Students will learn to create and maintain database objects (e.g., tables and views) as well as insert and manipulate data. Other important topics include basic queries, advanced queries (e.g., subqueries), joining data from multiple tables, and single-row and group functions. A grade of C or better is required. Prerequisite: ITEC 334 with a grade of C or better. Credit Hours: 3

ITEC371 - Introduction to Applied Data Analytics This course is designed to provide an overview of the process of data analysis - reporting, visualization and prediction. This course will explore the technology and practice of data analytics. This course uses the latest in technology to show the practice of data analytics. Students will experience practical applications of analytics through guided exercises and case studies. A grade of C or better is required. Restricted to ITEC majors or consent of school. Credit Hours: 3

ITEC380 - User Experience Design This course provides a comprehensive overview of the user experience design process, and is intended to familiarize students with the methods, concepts, and techniques necessary to make user experience design an integral part of developing information

interfaces. The course provides students with an opportunity to acquire the resources, skills, and hands-on experience they need to design, develop, and evaluate information interfaces from a user-centered design perspective. A grade of C or better is required. Prerequisite: ITEC 236 with a grade of C or better. Credit Hours: 3

ITEC381 - Special Topics Intensive study of selected topics relevant to the contemporary IT environment. Offered as need exists and as time and interests permit. May be repeated for up to nine hours total. Special approval needed from the advisor. A grade of C or better is required. Credit Hours: 1-9

ITEC390 - Career Development for IT Professionals This course prepares students to transition from the college environment to the working world or to graduate studies. Emphasis is placed on the exploration of career and advanced educational opportunities, identification of strengths, resume development, cover letter composition, interviewing, salary and benefits negotiations, networking, professional image, and the use of technology in achieving career goals. A grade of C or better is required. Prerequisite: ENGL 101 with a grade of C or better. Credit Hours: 3

ITEC392 - Special Projects Students will work with current technology to solve problems and develop projects in a team environment. May be repeated for up to nine hours total. Special approval needed from the instructor. A grade of C or better is required. Restricted to ITEC majors. Credit Hours: 1-6

ITEC395 - Cyber Defense Competition This course provides practical application of cyber defense and penetration testing methodologies in a fully operational corporate network environment. Skills required for cyber defense competition include implementation and evaluation of a network, risk assessment, incident response and management, as well as performing under time limitations in a team format. Students who successfully complete this course will be equipped to participate in the Collegiate Cyber Defense Competition (CCDC) and similar forums. A grade of C or better is required. Prerequisites: ITEC 209, 216, 224, 228, 235 all with a grade of C or better and consent of instructor. Credit Hours: 3

ITEC399 - Individual Study Provides student with the opportunity to develop a special program of studies to fit a particular need not met by other offerings. Enrollment provides access to the resource and facilities of the entire institution. Each student will work under the supervision of a sponsoring faculty member. A grade of C or better is required. Special approval needed from the sponsor and School Director. Credit Hours: 1-18

ITEC403 - Client-Side Web Development This course is designed to provide students with skills on advanced client-side web development languages and technologies used to build dynamic web applications. Strong knowledge of Object-Oriented programming, HTML5, CSS and JavaScript is required. The course includes JavaScript frameworks and libraries, declarative templates, APIs, responsive design, design patterns, data interchange formats, and data storage. A grade of C or better is required. Prerequisites: ITEC 236 and ITEC 312 each with a grade of C or better. Restricted to ITEC majors or consent from school. Credit Hours: 3

ITEC404 - Information Technology Project Management This course combines theory and techniques of project management emphasizing information technology applications. The course adheres to the Project Management Body of Knowledge (PMBOK). Course concepts are strengthened by the use of automated project management software. A grade of C or better is required. Prerequisite: ITEC 334 with a grade of C or better. Restricted to ITEC majors or consent from school. Credit Hours: 3

ITEC405 - Server-Side Web Development This course provides a comprehensive introduction to programming tools and skills used to build web applications. Students will gain hands-on experience with server-side web development technologies, such as PHP, MySQL, and Ajax. Students will be introduced to Model-View-Control (MVC), Web Database Access, Web Application Security, and File Transfer. Grade of C or better required. Prerequisites: ITEC 236, ITEC 312, & ITEC 370 each with a grade of C or better. Credit Hours: 3

ITEC411 - Information Storage and Management: Data, Drives and Disaster Recovery This course will provide students with fundamental understanding of a wide range of data storage devices, techniques, and systems ranging from individual standalone drives to large storage system clusters. Focus will be placed on enterprise storage systems in conjunction with lab exercises. Methods to create secure and recoverable storage systems and forensic discovery. A grade of C or better is required.

Prerequisite: ITEC 224 (with a grade of C or better) or consent of instructor. Restricted to majors within ITEC or consent of school. Credit Hours: 3

ITEC412 - Information Technology: Analysis, Design, and Implementation This course is designed to provide students with essential knowledge and pragmatic skills of information system analysis, design, and implementation. Special topics include systems development life cycle methodologies, system analysis and modeling methods, technical design specifications development, business forms and reports design, query languages, and information systems integration. In addition, students are expected to conduct projects to build field-based information system applications. A grade of C or better is required. Prerequisites: ITEC 265 and ITEC 334 each with a grade of C or better. Restricted to ITEC majors. Credit Hours: 3

ITEC415 - Enterprise Network Management This course teaches students about advanced services and application layer protocols used to support business communications in a complex enterprise network. Students will analyze technical business requirements in order to design and propose technology to meet those requirements. Implementation of the design using common technologies, software, and hardware will be performed as part of student lead lab exercises. Students will focus their network designs by implementing solutions relying on Microsoft Windows technologies. The integration of security principles within network designs is required. Lecture and laboratory. A grade of C or better is required. Prerequisites: ITEC 216, 224, 225, 228 and 235 with grades of C or better. Credit Hours: 3

ITEC417 - Wireless Communications & Security This course provides a comprehensive overview of wireless communications through an examination of the wireless channel, signal modulation, encoding and transmission techniques, antennae theory and error control. Uses of wireless technologies in local, personal and mobile networks will be examined. An emphasis will be placed on security measures and techniques in wireless communications. A grade of C or better is required. Prerequisites: ITEC 216 and ITEC 224 both with a grade of C or better. Credit Hours: 3

ITEC418 - Cloud Infrastructure and Data Center Technologies This course provides students with knowledge and hands-on experience with a wide range of enterprise technologies, cloud services and models, protocols, hardware, and software that support cloud computing deployments. The course will employ curriculum resources and tools and use cloud subscriptions available from industry leading IT vendors and manufacturers and may provide students with opportunities to earn academic certifications. The use of cloud services and analysis of offerings for solving challenges and improving technology services for organizations is focused. A grade of C or better is required. Credit Hours: 3

ITEC419 - Occupational Internship Students may secure an internship at a business/industry work site which relates to the student's academic program and career objectives. The student will perform duties and services as assigned by the work supervisor and internship coordinator, and will also complete reports and assignments. Pass/Fail. Credit Hours: 1-12

ITEC422 - Mobile Programming This course is designed to introduce students to mobile computing with a strong emphasis on application development for the mobile operating system. It gives students a solid foundation for developing and deploying their own apps onto the mobile market place. Topics will include the mobile development environment, user interfaces, audio, persistence, databases, location, sensors, and graphics. Lecture and laboratory. A grade of C or better is required. Prerequisite: ITEC 312 with a grade of C or better. Credit Hours: 3

ITEC431 - Applied Data Analytics with Python This course introduces student to applied data analytics using the Python programming language. Important topics include exploration of Python language fundamentals (lists, functions, packages, arrays, etc.), applications of data analytics techniques to gain business intelligence, and data visualization and representation in Python. A grade of C or better is required. Prerequisites: ITEC 209, ITEC 265, ITEC 371 all with a grade of C or better; or consent of instructor. Credit Hours: 3

ITEC432 - Applied Data Analytics with R This course is designed to help develop an understanding of fundamental data mining and data analytics methods and tasks. Important topics include data importing and exporting, data exploration, and data visualization. The lecture is complemented with hands-on learning experience with the use of the R language. A grade of C or better is required. Prerequisites: ITEC 209, ITEC 265, ITEC 371 all with a grade of C or better; or consent of instructor. Credit Hours: 3

ITEC435 - Web Development for Mobile Platforms This course will provide students with hands-on skills to plan, design, develop, and deploy mobile web applications using client-side web development languages including HTML5, CSS3, and JavaScript. Students learn by structuring and coding mobile web applications that include headers, footers, toolbars, navbars, lists, forms, grids, panels, and widgets. Students will implement designs and themes, and store, retrieve, and manipulate data on mobile devices. The course will culminate in the design, development, and deployment of a fully functional mobile web application. A grade of C or better is required. Prerequisites: ITEC 236 and ITEC 312 each with a grade of C or better. Credit Hours: 3

ITEC436 - Advanced Web-based Application Development Students will gain hands-on experience with web development using client-side and server-side scripting languages to create dynamic web pages and applications that access databases. This is an advanced programming course that requires good knowledge of HTML, computer programming, database, and SQL. A grade of C or better is required. Prerequisite: ITEC 405 with a grade of C or better or consent of instructor. Credit Hours: 3

ITEC440 - Introduction to Software Security This course provides a broad introduction of the theories and tools used for secure software design, threat analysis, secure coding, and vulnerability analysis. Students will be exposed to the techniques needed for the practice of effective software security approaches. A grade of C or better is required. Prerequisites: ITEC 209, 228, and 236, each with a grade of C or better or consent of instructor. Credit Hours: 3

ITEC446 - Software Development Concepts and Tools Students will be introduced to software engineering and agile development concepts, tools, and methods. Students will develop skills needed to construct high quality, reliable, and easy to maintain software systems. Prerequisite: ITEC 209 with a grade of C or better or consent of instructor. A grade of C or better is required. Credit Hours: 3

ITEC450 - Introduction to DevOps and Linux Automation This course will introduce students to the concept of DevOps and Linux Automation. Students will gain a working knowledge of what DevOps is and how it impacts IT. Students will learn how to install and configure Ansible on a management workstation and prepare managed hosts for automation. Students will write Ansible Playbooks to automate tasks and run them to ensure servers are correctly deployed and configured. A grade of C or better is required. Prerequisites: ITEC 209, ITEC 216, ITEC 224, ITEC 228, ITEC 235 each with a grade of C or better. Credit Hours: 3

ITEC452 - Research The selection, investigation, research, and writing on a specific topic approved by a faculty member. Special approval needed from instructor. A grade of C or better is required. Restricted to ITEC major. Credit Hours: 1-3

ITEC460 - Enterprise Security Policy, Tools, and Applications This course will introduce students to security policy, legal, and industry requirements that drive the technologies enterprises require to provide security protection for distributed networks in modern business computing environments. A reliance on partnerships with corporate and IT industry alliances and partnerships for resources and collaboration is a key component of this course. A grade of C or better is required. Prerequisite: ITEC 228 with a grade of C or better. Credit Hours: 3

ITEC461 - Introduction to Cryptography This course provides a broad introduction to cryptography. Students will learn how various cryptographic schemes work and explain how they are used in practice. The course focuses on the classical goals of cryptography such as data confidentiality, authenticity and integrity. Grade of C or better required. Prerequisites: ITEC 209, ITEC 280 each with a grade of C or better or consent of instructor. Credit Hours: 3

ITEC465 - Introduction to Machine Learning with Applications in Information Security This course offers a thorough grounding in machine learning concepts, along with practical advice on applying these tools and techniques in real-world data mining situations. It gives an overview of many concepts, techniques, and algorithms in machine learning such as decision trees, rule based classification, support vector machines, Bayesian networks, and clustering. Students will be introduced to the major applications of each of the topics, with some of the applications drawn from the field of information security. A grade of C or better is required. Prerequisites: ITEC 209 and ITEC 265 each with a grade of C or better. Credit Hours: 3

ITEC470 - Database Programming with SQL This course is designed to give students a conceptual understanding of database architecture and administration. Students will gain the necessary knowledge and skills needed to install, configure, set up, maintain, and troubleshoot a database. Other essential database admin tasks will be covered. A grade of C or better is required. Prerequisite: ITEC 370 with a grade of C or better. Restricted to ITEC major or consent of school. Credit Hours: 3

ITEC471 - Applied Data Analytics with Advanced SQL This course is designed to help develop an understanding of essential concepts and techniques of applied data analytics using advanced SQL analytic functions such as ranking, windowing, linear regression, hypothetical rand and distribution, etc. Students will gain hands on learning experience through formulating data analytics problems and building analytics queries in SQL. A grade of C or better is required. Prerequisites: ITEC 209, ITEC 265, ITEC 370 and ITEC 371 each with a grade of C or better. Credit Hours: 3

ITEC472 - Machine Learning with R This course familiarizes students with basic tasks of machine learning such as concept learning, function learning (predictive modeling), and clustering predictive patterns. Students will learn to choose among machine learning models and prepare, examine, and visualize data for machine learning algorithms and building machine learning models in R. Students will gain hands-on experience solving business problems by applying common machine learning algorithms and building machine learning models in R. A grade of C or better is required. Prerequisite: ITEC 432 with a grade of C or better. Credit Hours: 3

ITEC473 - Advanced Database Programming This course introduces students to advanced database programming using PL/SQL, Oracle's procedural extension language for SQL. PL/SQL code is used to automate and extend SQL, to administer the Oracle database, and is often embedded in or called from other software programs created in Java, C++, C#, PHP, and others. Course coverage includes language elements, variables and data types, cursors, decisions, loops, procedures, functions, packages, triggers, debugging, exception handling, and other topics. A grade of C or better is required. Prerequisites: ITEC 209 and ITEC 370 each with a C or better. Credit Hours: 3

ITEC474 - Data Warehousing This course introduces students to concepts and tool related to data warehousing. Topics include planning, design, implementation, and maintenance of data warehouses for analytics. Topics including architectures and infrastructures, dimensional data modeling, data quality, and the ETL process are also covered. A grade of C or better is required. Prerequisite: ITEC 370 with a grade of C or better or consent of instructor. Credit Hours: 3

ITEC491 - Seminar Students will examine a variety of information technology topics and/or problems. Special approval needed from the instructor. A grade of C or better is required. Credit Hours: 3

ITEC495 - Senior Project I This culminating course allows students to integrate skills and knowledge accumulated throughout the Information Technology program. Students, usually in small teams, will analyze, design, document, develop, implement, and assess an IT solution. A grade of C or better is required. Prerequisites: ITEC 312, ITEC 380, ITEC 404, ITEC 412 each with a grade of C or better. Credit Hours: 3

Information Technology Faculty

Imboden, Thomas, Associate Professor, Information Technology, M.S., DePaul University, 2007; 2008. Networking, cybersecurity.

Martin, Nancy, Associate Professor, Information, Technology, Ph.D., Southern Illinois University Carbondale, 2006; 2007. IS/IT education, assessment.

Shih, Stephen C., Professor, Information Technology, Ph.D., Pennsylvania State University, 1992; 2001. Data analytics, e-supply chain management, intelligent information systems design, health informatics.

Sissom, James D., Associate Professor, Information Technology, M.P.Ad., Southern Illinois University Carbondale, 1996; 2003. E-learning, data analytics, higher ed information technology.

Woodward, Belle S., Associate Professor, Information Technology, M.A., Webster University, 1997; 2004. Privacy, ethics and technology, women in computing.

Yang, Ning, Assistant Professor, Information Technology, Ph.D., Southern Illinois University, 2020; 2020. Security of internet of things, emerging networking technologies for connected vehicles, machine learning for security.

Last updated: 02/18/2022

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Catalog Year Statement:

Students starting their collegiate training during the period of time covered by this catalog (see bottom of this page) are subject to the curricular requirements as specified herein. The requirements herein will extend for a seven calendar-year period from the date of entry for baccalaureate programs and three years for associate programs. Should the University change the course requirements contained herein subsequently, students are assured that necessary adjustments will be made so that no additional time is required of them.