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### 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. According to ACM/IEEE, ITEC is an academic discipline that is concerned with issues related to advocating for users and meeting their needs within an organizational and societal context 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 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, and web systems, and cybersecurity. Many courses require significant hands-on computer activities related to software applications, languages, tools, application programming interfaces, network and system administration, web application development and operations, mobile app development, and operation, etc. Students also choose a number of elective courses from an approved list to reflect their personal interests in IT professional careers.

### Bachelor of Science Degree in Information Technology Requirements

#### Information Technology Major

Degree Requirements	Credit Hours
University Core Curriculum Requirements <sup>1</sup>	39
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 280 <sup>2</sup>	15
Requirements for Major in Information Technology	54
Required Major Courses- ITEC 312, ITEC 314, ITEC 334, ITEC 335, ITEC 336, ITEC 365, ITEC 366, ITEC 370, ITEC 380, ITEC 404, ITEC 412, ITEC 495	36
Approved Major Electives (Note: 15 hours must be at the 300- or 400-level) <sup>3</sup>	15
Cyber Security - ITEC 316, ITEC 335, ITEC 342, ITEC 415, ITEC 417, ITEC 460	

Degree Requirements	Credit Hours
Network and System Administration - ITEC 327, ITEC 335, ITEC 411, ITEC 415, ITEC 417, ITEC 418	
Web & Mobile App Development - ITEC 312, ITEC 403, ITEC 405, ITEC 422, ITEC 446	
Data Management - IST 345, IST 374, IST 470, IST 472, IST 473	
Applied Data Analytics - ITEC 371, ITEC 373, ITEC 374, ITEC 471, ITEC 472	
Additional Electives	15
<b>Total</b>	<b>120</b>

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

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

<sup>3</sup> Additional options are available to ITEC majors. Students should speak with an academic advisor for further information.

## The Capstone Option

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 ITEC.

## Online Degree Completion

The Information Technology offers an online delivery option for place-bound or working students to complete a Bachelor of Science degree in ITEC completely online. The same curriculum requirements apply to both residential and online students. Refer to the department's website for details.

If you have questions about the ITEC degree program, contact the academic advisor 618-453-7281.

## Information Technology Minor

The minor in Information Technology (ITEC) is offered to meet the demands of the 21st century. The ITEC minor introduces students to the study of information technology principles and skills to meet the needs of users within an organizational and societal context through the selection, creation, application, integration and administration of computing technologies. Because of its broad appeal to disciplines requiring the use of information technology, the minor in ITEC is an excellent complement to any degree program, regardless of major.

The ITEC minor requires 15-18 credit hours that consists of two required and three or four elective courses. The courses required to complete this minor include ITEC 209 and ITEC 216. Because of diverse student backgrounds and demands, ITEC minor students can choose interests in Data Analytics

and Management, Cybersecurity, Systems Analysis and Design, or Web and Mobile Application Development. Alternatively, ITEC minor students may select their own courses among the approved ITEC minor elective courses.

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. All students who wish to enroll in this minor must do so through the ITEC advisor.

## Information Technology Minor

Degree Requirements	Credit Hours
Required	6
ITEC 209 Introduction to Programming ITEC 216 Information Security Fundamentals	
Elective Courses	9-12
Data Analytics and Management	
ITEC 334, ITEC 370, ITEC 371; One of ITEC 373, ITEC 374, ITEC 411, ITEC 418, or ITEC 471	
Cyber Security Interest	
ITEC 224, ITEC 316, ITEC 335; One of ITEC 440, ITEC 460, ITEC 461, or ITEC 465	
Systems Analysis & Design	
ITEC 334, ITEC 404, ITEC 412	
Web & Mobile Application Development	
ITEC 312, ITEC 336, ITEC 405, ITEC 422	

## Information Technology Courses

**ITEC113 - Info Assurance Everyone** 113-3 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.

**ITEC207 - Prog Logic & Design** 207-3 Programming Logic & Design. This course provides students with the foundation for computer programming covering topics such as problem analysis, flowcharting, pseudocode, and algorithm development. Concepts such as documentation, structured design and

modularity are emphasized. The course also introduces topics in discrete mathematics such as number systems, sets and logic, relations and functions, and Boolean algebra. A grade of C or better is required.

**ITEC209 - Intro to Programming** 209-3 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.

**ITEC209G - Intro to Game Programming** 209G-3 Introduction to Game Programming. This course is designed to introduce students to the design and development of logical solutions to game design. The course will cover basic concepts and techniques for developing computer games with the support of a game engine. Upon completion, students will be able to develop algorithms, draw flowcharts, and process files and arrays using an appropriate computer programming language. The course activities include several programming assignments and the creation of a game as a final project. Required for the minor in Game Design and Development. A grade of C or better is required.

**ITEC216 - Information Security** 216-3 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.

**ITEC224 - Network Fundamentals** 224-3 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.

**ITEC225 - Operating Systems** 225-3 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.

**ITEC227 - Linux Essentials** 227-3 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.

**ITEC229 - Computing Business Admin** 229-3 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.

**ITEC240 - Desktop Publishing Apps** 240-3 Desktop Publishing Applications. This course is designed to introduce students to basic and advanced desktop publishing concepts and applications. The student will develop an understanding of terms related to page assembly, topography and other desktop publishing elements. The student will be able to describe basic desktop publishing design principles and apply them to the creation and production of documents including newsletters, flyers and brochures. Lecture and laboratory. A grade of C or better is required.

**ITEC259 - Occupational Education Credit** 259-1 to 60 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 majors in the School of Information Systems and Applied Technologies.

**ITEC280 - Discrete Math for IT** 280-3 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.

**ITEC299 - Individual Study** 299-1 to 16 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. Special approval needed from the instructor.

**ITEC306 - Android App Development** 306-3 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. Prerequisite: ITEC 209 with a grade of C or better.

**ITEC312 - Programming II** 312-3 Programming II. This course is designed to enable the student to use advanced programming techniques in the design and implementation of business application programs. Topics will include object-oriented programming, classes, inheritance, graphic user interfaces, and database access. A grade of C or better is required. Prerequisite: ITEC 209 with a grade of C or better.

**ITEC314 - Ethical & Legal Issues in IT** 314-3 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.

**ITEC316 - Intro to Cyber Operations** 316-3 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. Grade of C or better required. Prerequisite: ITEC 224.

**ITEC325 - Operating Systems** 325-3 Optimizing & Troubleshooting Operating Systems. This course will introduce both Linux and Windows operating systems, from a user and an administrator standpoint. Basic monitoring, optimizing, VM's and troubleshooting. Shell programming as the major emphasis. A grade of C or better is required. Prerequisite: ITEC 209 with a grade of C or better. Restricted to ITEC majors.

**ITEC327 - Linux Essentials** 327-3 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 course 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 laboratory. A grade of C or better is required.

**ITEC334 - Database Design & Processing** 334-3 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.

**ITEC335 - System Administration** 335-3 System Administration. This course focuses on administration of operating systems in a client-server environment. It prepares students to install and configure DNS, DHCP, WWW, Samba, NFS, SMTP for both Windows and Linux servers. A grade of C or better required. Prerequisites: ITEC 224, ITEC 225.

**ITEC336 - Web-Based Apps in IT** 336-3 Web-Based Applications in Information Technology. This course is designed to provide students with skills on the fundamentals of client-side web development languages used 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.

**ITEC340 - Intro Video Game Design** 340-3 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 for IST major or GDD minor.

**ITEC342 - Foundations & Apps of IoT** 342-3 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.

**ITEC343 - IoT OS Platforms** 343-3 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.

**ITEC345 - Health Information Systems** 345-3 Health Information Systems. This course introduces students to the field of health information systems. Students will explore the fundamentals of healthcare delivery and payment systems, the content, use, and structure of health data records, and common applications and standards used in healthcare information systems. Privacy, security, legal and ethical issues associated with health information will be examined. A grade of C or better is required.

**ITEC350 - Technical Career Subjects** 350-1 to 32 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. Special approval needed from the advisor.

**ITEC351 - Readings** 351-1 to 6 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.

**ITEC358 - Work Experience Credit** 358-1 to 30 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.

**ITEC365 - Data Apps & Interpretation** 365-3 Data Apps & Interpretation. 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.

**ITEC366 - Apps of Technical Comm** 366-3 Applications of Technical Communication. This course will increase students' abilities in communicating various workplace documents common to technical disciplines. The course is designed to meet the writing portion of the College's Communication-Across-

the-Curriculum initiative. A grade of C or better is required. Prerequisite: ENGL 101 with a grade of C or better.

**ITEC370 - Database Programming w/SQL** 370-3 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.

**ITEC371 - Intro Applied Data Analytics** 371-3 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.

**ITEC373 - Data Science with Python** 373-3 Applied Data Science with Python. This course introduces students to applied data science through Python programming language. Important topics include exploration of Python language fundamentals (lists, functions, packages, arrays, etc.), applications of data science techniques to gain business intelligence and new insight into the data as well as data visualization and representation in Python. A grade of C or better is required. Prerequisite: ITEC 209 with a grade of C or better. ITEC 365 recommended.

**ITEC374 - Applied Data Analytics with R** 374-3 Applied Data Analytics with R. This course is designed to help develop an understanding of fundamental data mining & data analytics methods and tasks. Important topics include data importing & exporting, data exploration, and data visualization. The lectures are complemented with hands-on learning experience with the use of a powerful open source language, R. A grade of C or better is required. Restricted to ITEC majors or consent of school.

**ITEC380 - User Experience Design** 380-3 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 336 with a grade of C or better.

**ITEC381 - Special Topics** 381-1 to 9 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.

**ITEC392 - Special Projects** 392-1 to 6 Special Projects. Students will work with current technology to solve problems and develop projects in a team environment. Special approval needed from the instructor. A grade of C or better is required. Restricted to ITEC majors.

**ITEC399 - Individual Study** 399-1 to 18 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. Special approval needed from the sponsor and School Director.

**ITEC403 - Client-Side Web Development** 403-3 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 312 and ITEC 336, each with a grade of C or better. Restricted to ITEC majors or consent from school.

**ITEC404 - IT Project Management** 404-3 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) using case studies to cover the PMBOK process areas. Students will apply project management skills. 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 or consent of instructor. Restricted to ITEC majors or consent from school.

**ITEC405 - Server-Side Web Dev** 405-3 Server-Side Web Development. This course provides a comprehensive introduction to programming tools and skills used to construct web server platforms. Students will gain hands-on experience with server-side technologies, such as PHP, JSP, and Ajax. In addition, web database access will be introduced. Grade of C or better required. Prerequisites: ITEC 312 (or concurrent enrollment in ITEC 312), ITEC 336, & ITEC 370 (each with a grade of C or better) or consent of instructor.

**ITEC411 - Info Storage & Mgmt** 411-3 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.

**ITEC412 - IT: Analysis, Design, Impl** 412-3 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 334, ITEC 365, ITEC 366 or equivalent, each with a grade of C or better. Restricted to ITEC majors.

**ITEC415 - Enterprise Network Mgmt** 415-3 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.

**ITEC417 - Wireless Comm & Security** 417-3 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.

**ITEC418 - Cloud & Data Center Tech** 418-3 Cloud Infrastructure and Data Center Technologies. This course is aimed at providing students with knowledge and hands-on experience with a wide range of enterprise technologies, protocols, hardware, and software that support data centers and cloud computing deployments. The course will employ curriculum resources and tools available from industry leading IT vendors and manufacturers and will provide students with opportunities to earn academic certifications from some of these vendors in the areas of cloud infrastructure and services, next generation firewalls, and other technologies. A grade of C or better is required. Prerequisite: ITEC 224 with a grade of C or better. Restricted to ITEC majors.

**ITEC419 - Internship** 419-1 to 12 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.

**ITEC422 - Mobile Programming** 422-3 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.

**ITEC426 - App Development Environments** 426-3 Application Development Environments. This course is designed to allow students to develop computer applications using an object-oriented programming language. Topics will include the usage of an application development environment, subprocedures, menus, database files and graphics. Grade of C or better required. Prerequisite: ITEC 312 with a grade of C or better or consent of instructor.

**ITEC436 - Adv Web-based App Development** 436-3 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.

**ITEC440 - Software Security** 440-3 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, 316, and 336, each with a grade of C or better or consent of instructor.

**ITEC446 - Software Development** 446-3 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.

**ITEC452 - Research** 452-1 to 3 Research. The selection, investigation, research and writing on a specific topic approved by a faculty member. Not for graduate credit. Special approval needed from the school. A grade of C or better is required. Restricted to ITEC major.

**ITEC460 - Enterprise Security** 460-3 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.

**ITEC461 - Intro to Cryptography** 461-3 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.

**ITEC465 - Machine Learning** 465-3 Introduction to Machine Learning with Applications in Information Security. This course provides a broad introduction to machine learning. It gives an overview of many concepts, techniques, and algorithms in machine learning such as fuzzy systems, artificial neural networks, evolutionary computation, and hybrid systems. Grade of C or better required. Prerequisites: MATH 108, ITEC 209 each with a grade of C or better or consent of instructor.

**ITEC470 - Database Administration** 470-3 Database Administration. This course is designed to give a thorough conceptual understanding of database architecture and administration. Will gain the necessary knowledge and skills needed to install, configure, set up, maintain, and troubleshoot a database. Other

database admin tasks will be covered including establishing backup and recovery policies, implementing & maintaining database security, conducting database tuning, monitoring database performance & capacity, & planning for future expansion. 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.

**ITEC471 - Data Analytics SQL** 471-3 Applied Data Analytics with Advanced SQL. This course is designed to help students develop an understanding of essential concepts and techniques of applied data analytics using advanced SQL analytic functions, such as ranking, windowing, linear regression, hypothetical rank 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. Prerequisite: ITEC 370 with a grade of C or better. Restricted to ITEC major or consent of school.

**ITEC472 - Machine Learning with R** 472-3 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 374 with a grade of C or better.

**ITEC473 - Adv Database Programming** 473-3 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.

**ITEC474 - Data Warehousing** 474-3 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.

**ITEC491 - Seminar** 491-3 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.

**ITEC495 - Senior Project I** 495-3 Senior Project I. This culminating course allow students to integrate skills and knowledge accumulated throughout the Information Systems Technologies 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.

## Information Technology Faculty

**Imboden, Thomas**, Associate Professor, M.S., DePaul University, 2007.

**Legier, John**, Associate Professor, Ph.D., Southern Illinois University Carbondale, 2007.

**Martin, Nancy**, Associate Professor, Ph.D., Southern Illinois University Carbondale, 2006.

**Rahimi, Nick**, Assistant Professor, Ph.D., Southern Illinois University Carbondale, 2017.

**Shih, Stephen C.**, Professor, Ph.D., Pennsylvania State University, 1992.

**Sissom, James D.**, Associate Professor, M.P. Ad., Southern Illinois University Carbondale, 1996.

**Wang, Andy Ju An**, Professor and Dean, Ph.D., Beijing University of Aeronautics and Astronautics, 1992.

**Woodward, Belle S.**, Associate Professor, M.A., Webster University, 1997.

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Last updated: 11/05/2019

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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.