Information Systems Technologies

Information Systems Technologies is a baccalaureate degree major designed to prepare students for careers in a wide variety of work settings that rely on computerized information technologies to accomplish organizational goals. The curriculum recognizes that graduates must have good computer application skills as well as an understanding of the principles of organizations and systems, including an awareness of technological, economic, political, social and cultural factors. Many courses require significant hands-on computer activities related to applications software, networking communications and computer troubleshooting and maintenance. Students may also choose ten courses from an approved list to reflect their personal interests in Information Systems Technologies.

Significant computer resources are available to students in this program for instructional purposes and for completion of assignments. The courses are based on a nationally recognized model curriculum, ACM/IEEE Information Technology Curricula (IT Curricula). Graduates of this program will meet the continuing needs of business and industry for personnel to use computer systems technologies within organizations utilizing end-user information systems. They will be able to supervise the planning and implementation of information systems in work/office environments, and deal with people, and procedures and equipment resources of companies in this country or abroad.

Students entering the Information Systems Technologies degree must be able to keyboard at a competency level adequate enough to complete a variety of computer related tasks and assignments (generally considered at 30 wpm or above). The Capstone Option is available to qualified students entering these programs. More information about the Capstone Option can be found at articulation.siu.edu/capstone/.

Information Systems Technologies offers an option for place-bound transfer students to complete the degree by taking advanced career and elective courses online. Refer to the department's website for detail.

The Information Systems Technologies program has signed a number of Program Articulation Agreements with computer/word/information processing-related community college 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 Systems Technologies. If you have questions about how these agreements apply to your personal situation, contact the school’s program representative or contact the academic advisor in Information Systems Technologies at 618/453-7253 or http://isat.siu.edu/undergraduate/information-technology/.

Bachelor of Science Degree in Information Systems Technologies Requirements

Information Systems Technologies Major

<table>
<thead>
<tr>
<th>Degree Requirements</th>
<th>Credit Hours</th>
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<tr>
<td>University Core Curriculum Requirements</td>
<td>39</td>
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Recommend PHIL 104 or PHIL 105, and ECON 113, PSYC 102 or SOC 108
### Degree Requirements

<table>
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<tr>
<th>Requirement</th>
<th>Credit Hours</th>
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<tbody>
<tr>
<td>Career Course Requirements - IST 209, ISAT 216, ISAT 224</td>
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<tr>
<td>Requirements for Major in Information Systems Technologies</td>
<td>60</td>
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<tr>
<td>Required Major Courses</td>
<td>27</td>
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<tr>
<td>IST 314, IST 334, IST 336, IST 370, IST 404, IST 412, ISAT 365, ISAT 366, ISAT 419</td>
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<tr>
<td>Approved Major Electives (Note: 15 hours must be at the 300- or 400-level)</td>
<td>33</td>
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<tr>
<td>Cyber Security - ISAT 316, ISAT 335, ISAT 342, ISAT 415, ISAT 417, ISAT 460</td>
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<td>Network and System Administration - ISAT 327, ISAT 335, ISAT 411, ISAT 415, ISAT 417, ISAT 418</td>
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<td>Internet of Things (IoT) - ISAT 327, ISAT 342, ISAT 417, EST 308, EST 343, EST 407</td>
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<td>Web &amp; Mobile App Development - IST 312, IST 403, IST 405, IST 422, IST 446</td>
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<td>IT/IS Management (online only) - IST 446, EST 385, EST 387, EST 388, EST 451</td>
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<td>Data Management - IST 345, IST 374, IST 470, IST 472, IST 473</td>
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<td>Applied Data Analytics - IST 371, IST 373, IST 374, IST 471, IST 472</td>
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<tr>
<td>Additional Electives</td>
<td>12</td>
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<td>Total</td>
<td>120</td>
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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 AAS degree from an accredited community college.
3 The current approved list is on file in the school office.

### Information Systems Technologies Courses

**IST207 - Program Logic and 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.

**IST209 - Intro to Programming** 209-3 Introduction to Programming. This course is designed to introduce students to the design and development of logical solutions to business information processing problems. Upon completion, students will be able to develop algorithms, draw flowcharts and process files and tables using an appropriate computer programming language. Lecture and laboratory. A grade of C or better is required.

**IST209G - 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.

**IST240 - Desktop Publishing Application** 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. Lectures and lab. A grade of C or better is required.

**IST259 - Occupational Educ Credit** 259-1 to 60 Occupational Education Credit. A designation for credit granted for past occupational educational experiences related to the student’s educational objectives. Credit will be established by school director evaluation. This credit may be applied only at the 100 and 200 level unless otherwise determined by the department chair. Restricted to IST major.

**IST299 - Individual Study** 299-1 to 16 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 and school director. Special approval needed from the sponsor and school director.

**IST306 - 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 application 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: IST 209 (with a grade of C or better) or IST 209G (with a grade of C or better) or consent of instructor.

**IST311 - Android Application Development** 311-3 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 application for Android services. 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: IST 209 (with a grade of C or better) or IST 209G (with a grade of C or better) or consent of instructor.

**IST312 - 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: IST 209 (with a grade of C or better) or consent of instructor.

**IST314 - Ethics & Legal Issues in IT** 314-3 Ethical and Legal Issues in IT. This course introduces students to the issues and controversies that comprise the field of Cyberethics. It treats Cyberethics as an interdisciplinary field of study and aims at addressing those in the information technology, information security and networking fields of study. This course covers key concepts/terms, actual case examples
and hypothetical scenarios involving privacy, security, intellectual property, and speech in cyberspace to illustrate ethical controversies that convey the seriousness of the issues under consideration. These concepts and cases receive reinforcement with review/study and discussion/essay questions to facilitate readers' comprehension and reflection of ethical issues. A grade of C or better is required. Restricted to IST major.

**IST325 - Operating Systems** 325-3 Optimizing and 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. IST majors require a grade of C or better. Prerequisite: IST 209 with a C or better.

**IST334 - 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. A grade of C or better is required.

**IST336 - Web-based Applications** 336-3 Web-based Applications in Information Systems. 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. A grade of C or better is required. Prerequisite: IST 209 with a grade of C or better. Restricted to IST major.

**IST345 - Informatics in Prof Fields** 345-3 Informatics in Professional Fields. This course introduces students to the field of informatics. Informatics is computing in context, or applying information technology to convert data and information into useful knowledge to solve big problems. Informatics has applications in arts, sciences, business, and professions. Students will explore the fundamentals of informatics in a specific professional field such as healthcare, marketing, finance, media, entertainment, or others. A grade of C or better is required. Restricted to IST major.

**IST350 - 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 health service occupations offered through various workshops, special short 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. Restricted to IST major.

**IST351 - Readings** 351-1 to 6 Readings. Selected readings in specific information systems topics not ordinarily covered in depth in other courses. Special approval needed from the instructor.

**IST358 - Work Experience Credit** 358-1 to 30 Work Experience Credit. Credit will be granted via departmental 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. This credit may be applied only to the Major Requirements of the Information Systems Technologies degree. Restriction: IST major.

**IST365 - Intro to Data Analysis** 365-3 Introduction to Data Analysis. 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, the analysis and synthesis of data, and the interpretation and utilization of data. Students will gain experience using analytical tools for data analysis and decision-making. A data analysis project is required. IST majors must earn a grade of C or better. Prerequisite: University Core Curriculum mathematics requirement or consent of school.

**IST370 - Database Programming 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: IST 334 (with a grade of C or better) or consent of instructor.

**IST371 - Intro Applied Data Analytics** 371-3 Introduction to Applied Data Analytics. Overview of the process of data analysis. Data analytics have moved out of the academic world of statisticians to the practical world of technology. A variety of user friendly technologies bring powerful analytical capabilities to end users. Three major areas that comprise analytics are reporting, visualization and prediction. This course uses the latest in technology to show the practice of data analytics in the real world. You will experience practical applications of analytics through guided exercises and case studies. A grade of C or better is required. Restricted to IST major or consent of school.

**IST373 - Data Science-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.

**IST374 - Data Analytics with R** 374-3 Applied Data Analytics with R. This course is designed to help students develop an understanding of fundamental data mining & data analytics methods and tasks. Important topics include data importing & exporting, data exploration, and data visualization. Selected data mining tasks (e.g., time series analysis) will be covered. 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 IST major or consent of school.

**IST392 - Special Projects** 392-1 to 6 Special Projects. (Same as MCMA 499) Students will work with current technology to solve problems and develop projects in a team environment. Restricted to IST major. Special approval needed from the instructor.

**IST403 - 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 introduces 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: IST 312 and IST 336, each with a grade of C or better. Restricted to IST major.

**IST404 - IT Project Management** 404-3 Information Technology Project Management. 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. Not for graduate credit. Prerequisite: IST 334 with a grade of C or better or consent of instructor.

**IST405 - 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. Prerequisite: IST 312, IST 336, IST 370 (each with a grade of C or better) or consent of instructor.

**IST406 - Assistive Tech & Acc Web** 406-3 Assistive Technologies and Accessible Web Design. This course examines how people with disabilities use computer technology and access electronic information. Topics include the history, characteristics, and service delivery of assistive technologies, web site evaluation and repair, design of universally accessible web resources, and major legislative initiatives applied to ameliorate problems faced by persons with disabilities. A grade of C or better is required. Not for graduate credit. Prerequisite: IST 336 with a grade of C or better or consent of instructor.

**IST412 - IS: Analysis & Design** 412-3 Information Systems: 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: IST 334, ISAT 365, ISAT 366 or equivalent, each with a grade of C or better. Restricted to IST major.

**IST414 - Trends & Issues in Info Sys** 414-3 Trends and Issues in Information Systems. Explores special topics related to the nature, types, role, and impact of information systems in organizations and methodological concepts for understanding information systems in the future. Students will envision, identify, evaluate, select, and recommend computer-based technologies/solutions for organizational problems. Not for graduate credit. A grade of C or better is required. Prerequisite: ISAT 366. Restricted to IST major.

**IST415 - Cases in IST** 415-3 Cases in Information Systems Technology. Using case studies, this course involves the analysis, synthesis, application and evaluation of advanced concepts related to information systems. Grade of C or better required. Not for graduate credit. Prerequisites: IST 334 and ISAT 366 with a grade of C or better, or consent of instructor.

**IST419 - Occupational Internship** 419-3 Occupational Internship. Each student is required to 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 assigned by the work supervisor and internship coordinator, and will also complete reports and assignments. Minimum of 3 credit hours required for Information Systems Technologies majors. Not for graduate credit.

**IST422 - Mobile Programming** 422-3 Mobile Programming. This course is designed to introduce students 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, SQLite databases, location, sensors, and graphics. Lecture and laboratory. A grade of C or better is required. Prerequisite: IST 312 with a grade of C or better.

**IST426 - App Devlp 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. Not for graduate credit. Prerequisite: IST 209 with a grade of C or better or consent of instructor. Restricted to IST major.

**IST436 - 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. Not for graduate credit. Prerequisite: IST 405.

**IST441 - IST Profession** 441-3 The Information Systems Technologies Profession. This course engages students in research and advanced study related to the Information Systems Technologies (IST) profession. Topics include, but are not limited to: the historical development of the profession; trends and future directions of information systems technologies in the global economy; professional standards and ethics; related professional organizations; and employment opportunities for information systems professionals. Each student is required to complete a separate research report that is related to the student's career goals. Concurrent enrollment in one semester hour of 350 is required. Grade of C or better required. Not for graduate credit. Restricted to IST major.

**IST446 - Agile Software & Analytics** 446-3 Agile Software Development & Data Analytics. Students will be introduced to agile concepts, tools, and methods. Students will develop skills to apply agile techniques to software development and data analytics projects. Grade of C or better required. Not for graduate credit. Prerequisite: IST 209 and ISAT 365 (both with a grade of C or better) or consent of instructor. Restricted to IST major.

**IST452 - 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. Students can take this course across multiple semesters with variable credit hours (maximum 6). A grade of C or better is required. Restricted to IST major.
IST470 - Adv Database Concepts 470-3 Advanced Database Concepts. 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 administrative tasks will be covered. Grade of C or better is required. Not for graduate credit. Prerequisite: IST 370 with a C or better or consent of instructor.

IST471 - 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 analytic queries in SQL. A grade of C or better is required. Prerequisite: IST 370 with a grade of C or better. Restricted to IST major.

IST472 - Machine Learning with R 472-3 Machine Learning with R. This course helps students get familiar 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 as well as prepare, examine, and visualize data for machine learning. For pragmatic learning experience, students will solve business applications by applying common machine learning algorithms and building machine learning models in R. A grade of C or better is required. Prerequisite: IST 370 with a grade of C or better. Restricted to IST major.

IST473 - Advanced DB Programming 473-3 Advanced DB 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: IST 209 and IST 370, both with C or better. Restricted to IST major.

IST474 - Data Warehousing 474-3 Data Warehousing. This course introduces students to concepts and tools 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: IST 370 with a grade of C or better or consent of instructor. Restricted to IST major.

IST491 - Seminar 491-3 Seminar. Students will examine a variety of information systems technologies topics and/or problems. Not for graduate credit. Special approval needed from the school.

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Carbondale, IL 62901
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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.