Informatics

Business Informatics

The Business Informatics major prepares students for a wide variety of careers, including systems analysis, software and web development, and database design. With a breadth of course offerings that include an emphasis on programming and software development, analytical thinking and problem solving, communication, system modeling, and business concepts, Business Informatics majors are valuable to employers both for their technical skills as well as their ability to solve organizational problems. All modern organizations rely on information technology to function, and Business Informatics majors are uniquely positioned to apply that technology to effectively support an organization’s operations.

Health Informatics

The Health Informatics degree is designed to enable graduates to enter careers in information systems usage in healthcare organizations. Information systems play an increasingly important role in the burgeoning healthcare field and the HI degree is intended to develop the skills necessary to manage information systems in a healthcare environment. The degree is delivered in cooperation with Idaho State University's Kasiska School of Health Professions. Combining courses in healthcare administration, general business, and informatics, the Health Informatics degree prepares students to work in hospitals, health clinics, and doctors' offices, as well as other health-related organizations.

Moreover, we include an applied educational component in our Business Informatics and Health Informatics programs so that our students have the opportunity to learn through applying the concepts studied in the classroom.

Faculty

Chair and Professor

Parker, Kevin R.,* Department Chair and Professor, Informatics. B.A. 1982, University of Texas at Austin; M.S. 1991, Ph.D. 1995, Texas Tech University. (1999)

Professors

Ottaway, Thomas A.,* Dean and Professor, College of Business. B.S. 1990, Wichita State University; M.S. 1993, Ph.D. 1995, Texas Tech University. (2001)

Schou, Corey D.,* Associate Dean for Information Assurance and Professor, College of Business; Director, Informatics Research Institute. B.S. 1968, Rollins College; M.S. 1970, Ph.D. 1972, Florida State University. (1985)

Assistant Professors


Houghton, Robert, Assistant Professor, Informatics. B.M. 2006, Utah State University; M.S. 2008, Utah State University; Ph.D. 2013, Utah State University. (2014)

Payne, Velma, Director of Health Informatics and Assistant Professor, Informatics. B.S. 1984, Oral Roberts University; M.S. 1996, Robert Morris University; M.B.A. 1997, Robert Morris University; M.S. 2008, University of Pittsburgh; Ph.D. 2011, University of Pittsburgh. (2017)

Lecturers


Business Informatics Major Requirements

<table>
<thead>
<tr>
<th>Course Code</th>
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<th>Credits</th>
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</thead>
<tbody>
<tr>
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</tr>
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<td>INFO/CS 1181</td>
<td>Informatics and Programming I</td>
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</tr>
<tr>
<td>INFO 2220</td>
<td>Web Development: Client-Side Programming</td>
<td>3</td>
</tr>
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<td>INFO 3307</td>
<td>Systems Analysis and Design</td>
<td>3</td>
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<td>Networking and Virtualization</td>
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</tr>
<tr>
<td>INFO 4430</td>
<td>Web Application Development</td>
<td>3</td>
</tr>
<tr>
<td>INFO 4482</td>
<td>Systems Development and Implementation Methodologies</td>
<td>3</td>
</tr>
<tr>
<td>INFO 4493</td>
<td>Advanced Informatics Internship *</td>
<td>3</td>
</tr>
</tbody>
</table>

Total Credits 30

* INFO 4493 will meet the College of Business applied educational requirement.

College of Business 3393 internships and College of Business Core Courses do not count toward the 30 credit hour major course requirement. However, 3393 internships may be taken to meet the College of Business applied educational requirement.

Health Informatics Major Requirements

Required Courses

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<td>INFO 4422</td>
<td>Health Information Governance</td>
<td>3</td>
</tr>
<tr>
<td>INFO 4424</td>
<td>Healthcare Workflow Process Analysis and Redesign</td>
<td>3</td>
</tr>
<tr>
<td>INFO 4426</td>
<td>Health Data Analytics</td>
<td>3</td>
</tr>
<tr>
<td>HCA 1115</td>
<td>US Health System</td>
<td>3</td>
</tr>
<tr>
<td>HCA 4465</td>
<td>Healthcare Operations and Quality</td>
<td>3</td>
</tr>
<tr>
<td>HCA 4489</td>
<td>Healthcare Information Systems</td>
<td>3</td>
</tr>
</tbody>
</table>

Total Credits 39

* HCA 4489 also meets the College of Business applied educational requirement.

Minor in Informatics

Students receiving degrees in all colleges may satisfy the requirements for an Informatics minor by completing the following courses. Students must choose the Business Informatics option or the Health Informatics option. Students pursuing
this minor should seek assignment of a minor advisor early in their program to complete a Program of Study Agreement.

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</table>

Select ONE of the following options:

**A) Business Informatics Option**

INFO 1150 Software and Systems Architecture

**OR**

**B) Health Informatics Option**

INFO/HCA 3330 Health Informatics

Total Credits: 18

**Post-Baccalaureate Certificate in Informatics**

A certificate in Informatics is offered for those students who have a bachelor's degree in a field other than Business or Health Informatics and want to improve their knowledge of information systems. To earn a certificate in Informatics, a student must complete 33 total credit hours from the following list. At least twelve of those credits must be taken after the student has completed a bachelor's degree. Students must choose a Business Informatics emphasis or a Health Informatics emphasis.

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</tr>
<tr>
<td>INFO 3301</td>
<td>Introduction to Informatics and Analytics</td>
<td>3</td>
</tr>
<tr>
<td>INFO 3307</td>
<td>Systems Analysis and Design</td>
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<td>INFO 4407</td>
<td>Database Design and Implementation</td>
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Select ONE of the following emphases:

**A) Business Informatics Emphasis**

INFO 4411 Intermediate Information Assurance
INFO 4482 Systems Development and Implementation Methodologies

Students must take six (6) hours of Business courses in any of the following areas:

Accounting
Economics
Finance
Management
Marketing

**OR**

**B) Health Informatics Emphasis**

INFO/HCA 3330 Health Informatics
INFO 4422 Health Information Governance

**Courses**

**INFO 1100 Fundamental Computer Literacy: 3 semester hours.**
Use of basic productivity software. Includes familiarization with word processing, presentations, spreadsheet, Internet. D

**INFO 1101 Digital Information Literacy: 3 semester hours.**
Focuses on how to locate, evaluate, and utilize information using digital resources, i.e., computers, mobile devices, and the Internet. As such, the course begins by establishing a common model of computing that will help to understand current technologies, from cell phones to supercomputers, as well as future computing technologies. The course then investigates how best to use those tools to properly identify, collect, evaluate, synthesize, and present information. Satisfies Objective 8 of the General Education Requirements. F, S

**INFO 1110 Web Development: Essentials: 3 semester hours.**
Introduction to the fundamentals of web site creation. Students will develop, manage, and maintain professional web sites using HTML5 and Cascading Style Sheets, and explore web site design and layout, accessibility, and globalization issues. D

**INFO 1150 Software and Systems Architecture: 3 semester hours.**
Principles and application of computer hardware and systems software in the context of designing business IT infrastructures through combination of theory-based lectures and applied laboratory experiences. COREQ: INFO 1181/CS 1181. D

**INFO 1181 Informatics and Programming I: 3 semester hours.**
Problem-solving methods and algorithm development with an emphasis on programming style with Java or C#. Includes Secure Software Concepts, such as what constitutes secure software and what design aspects to take into consideration to construct resilient software. Equivalent to CS 1181. Satisfies Objective 7 of the General Education Requirements. PRE-or-COREQ: MATH 1143 or MATH 1147. F, S

**INFO 1182 Informatics and Programming II: 3 semester hours.**
Object-oriented programming in the context of design, using OO principles and UML diagrams. Includes Secure Software Concepts, such as what constitutes secure software and what design aspects to take into consideration to construct resilient software. PREREQ: INFO 1181/CS 1181. F,S

**INFO 2220 Web Development:Client-Side Programming: 3 semester hours.**
Introduces interactive web development using a client-side language like JavaScript. Basic programming concepts common to almost all programming languages form the basis of the course. Exercises are designed to enhance students' problem-solving techniques and analytical thinking skills. PREREQ: INFO 1181/CS 1181. D

Students must complete at least three credits as upper division coursework (3000 or 4000-level) within their selected emphasis.

Students must receive a grade higher than a C- in all coursework that applies to the Post-Baccalaureate Certificate in Informatics.

Students must meet with an advisor and complete a Program of Study Agreement prior to the second semester of coursework.

**INFO 4424 Healthcare Workflow Process Analysis and Redesign**
**HCA 1115 US Health System**
**HCA 4465 Healthcare Operations and Quality**
**HCA 4489 Healthcare Information Systems Practicum**

Total Hours: 33
INFO 3301 Introduction to Informatics and Analytics: 3 semester hours.
Techniques and tools for analyzing and solving business problems. Data analytics methodologies, predictive and forecasting procedures, along with executive style dashboard reporting are covered using intermediate spreadsheet functionalities. PRE-or-COREQ: INFO 1100 or equivalent skills and knowledge. F, S

INFO 3303 Informatics Concepts: 3 semester hours.
A survey course to introduce basic informatics principles, theories, and technology to non-business students. D

INFO 3307 Systems Analysis and Design: 3 semester hours.
Develops systems analysis skills using proven techniques, prototyping, and structured analysis and design phases of the systems development life cycle. The course emphasizes Secure Software Design, which includes secure design elements, software architecture, secure design review, and threat modeling. Requirements gathering is emphasized, including secure software requirements gathering to capture all of the security requirements from various stakeholders and understand the sources and processes needed to ensure a more effective design. PREQ: INFO 1181/CS 1181 or INFO 3303. D

INFO 3310 Introduction to Information Assurance: 3 semester hours.
A survey course providing an introduction to the fields of Information Assurance and Privacy. Emphasizes legal and ethical components of information security practices. The course is designed primarily for non-INFO majors. Not applicable toward INFO major. D

INFO 3330 Health Informatics: 3 semester hours.
Introduction to and overview of the evolution of information systems to support health services in the healthcare industry, its current state and future directions and challenges. Students will learn the regulatory requirements and standards that drive the data content and structure, collection, storage, retrieval, dissemination, and transmission, as well as legal issues related to collection, use, and the security of health information. The course will survey cross-functional factors and ethical concerns in the design and implementation of information technologies (clinical, administrative, and learning), knowledge management principles, professional practice trends, and explore some of the emerging information technology in healthcare. Equivalent to HCA 3330. D

INFO 3380 Networking and Virtualization: 3 semester hours.
Study of the implementation and development of network information systems. Protocols and techniques will be compared, and virtualization and cloud computing will be emphasized. PREREQ: INFO 1150 or CS 2275 or INFO 3303. D

INFO 3393 Informatics Internship: 1-3 semester hours.
Internship program coordinated by faculty providing significant exposure to INFO issues. May not be used to fulfill major requirements. Graded S/U. F, S

INFO 4407 Database Design and Implementation: 3 semester hours.
Covers multi-user relational database management systems, stored procedures, SQL, transaction processing, etc. The course emphasizes Secure Software Design, which includes secure design elements, software architecture, secure design review, and threat modeling. PREREQ: INFO 3307 and either INFO 1182 or CS 1182. D

INFO 4411 Intermediate Information Assurance: 3 semester hours.
Focuses on homeland security, information assurance, integrity, control, and privacy. Covers CNSS-4011, NIST-800-16 standards, national policy, and international treaties. The course considers Software Deployment, Operations, Maintenance and Disposal, including security issues around steady state operations and management of software, as well as security measures that must be taken when a product reaches its end of life. PREREQ: INFO 1150 or CS 2275 or INFO 3310, or permission of instructor. D

INFO 4412 Systems Security for Senior Management: 1-3 semester hours.
Review of system architecture, system security measures, system operations policy, system security management plan, and provisions for system operator and end user training. COREQ: INFO 4419. PREREQ: INFO 4416 or permission of instructor. D

INFO 4413 Systems Security Administration: 1-3 semester hours.
Outlines the basic principles of systems security administration. The student will be introduced to the methods and technologies associated with running a system to maintain privacy and security. COREQ: INFO 4419. PREREQ: INFO 4411 or permission of instructor. D

INFO 4414 Systems Security Management: 1-3 semester hours.
Establishes a framework for managing both systems and systems administrators operating in a secure and private computing environment. The course deals with facilities management, contingency plans, laws, standards of conduct and operations management. COREQ: INFO 4419. PREREQ: INFO 4413 or permission of instructor. D

INFO 4415 System Certification: 1-3 semester hours.
Describes the techniques and methods for certifying a system is in compliance with national and governmental information assurance standards. Evaluates various certification methodologies. COREQ: INFO 4419. PREREQ: INFO 4414 or permission of instructor. D

INFO 4416 Risk Analysis: 1-3 semester hours.
Develops techniques to characterize and provide perspective on the likelihood of adverse events. Explains methods to characterize the consequences and general costs associated with the various adverse events occurring. The analysis provides insight into various likelihood and consequence combinations. COREQ: INFO 4419. PREREQ: INFO 4415 or permission of instructor. D

INFO 4419 Advanced Informatics Practicum: 1-3 semester hours.
Significant informatics experience including research coordinated by the faculty designed to provide broad exposure to issues in Information Assurance. Does not fulfill major/minor requirements. May be repeated for up to 6 credits. Graded S/U. PREREQ: Permission of instructor. D

INFO 4422 Health Information Governance: 3 semester hours.
The aim of this course is to provide a broad base of understanding of the range of issues that IT professionals must be aware of upon entering the healthcare industry. Students will be exposed to the current state of health industry security environment and the larger regulatory environment in which healthcare organizations operate. This is important in light of the recent move towards cloud-based electronic health records (EHRs) and third party-developed health applications. Further, issues relating to privacy/security, information governance and information risk assessment will also be covered. Finally, students will be exposed to interventions that can help mitigate the risks identified. PREREQ: INFO 3330. D

INFO 4424 Healthcare Workflow Process Analysis and Redesign: 3 semester hours.
The aim of this course is to provide a broad-based understanding of workflow processes in the healthcare industry. In particular, the course will develop skills necessary to critically analyze and redesign the patient flow processes and utilize health IT systems both in the administrative and clinical landscape to achieve greater operational efficiency and provide higher quality of care to patients. Quality improvement methods and tools as well as process change implementation, improvement, and management will also be discussed in this course. PREREQ: INFO 3330. D
INFO 4426 Health Data Analytics: 3 semester hours.
Introduction to and the use of intermediate analytical skills to identify trends, correlations to predict outcomes and provide meaningful recommendations. Variety of data sources and structures are identified and transformed into relevant information in the clinical context to recommend new treatments and technologies, improve effectiveness and efficiency, design and plan policy and programs, improve service delivery and operations, enhance sustainability, mitigate risk, and provide a means for measuring and evaluating critical organizational data that helps the healthcare organization to achieve increased quality of care and patient satisfaction. PREREQ: INFO 3330 and MGT 2217. D

INFO 4430 Web Application Development: 3 semester hours.
Focuses on the development of dynamic, online applications using a programming language like PHP or ASP.Net and a relational database. The course will consider Secure Software Implementation/Coding, which involves secure coding practices, avoiding vulnerabilities, and reviewing code to ensure that there are no errors in the code or security controls. PREREQ: INFO 2220. PRE-or-COREQ: INFO 4407. D

INFO 4432 Mobile Application Development: 3 semester hours.
This course will introduce mobile app programming and provide theoretical and practical knowledge to design and build mobile applications. Students will learn various techniques in mobile app development using a programming language like Java. PREREQ: INFO 1182 or CS 1182. D

INFO 4482 Systems Development and Implementation Methodologies: 3 semester hours.
This course presents the process of software development and the methodologies to lower development costs, increase software reliability, decrease development time and ensure application development success. An overview and comparison of traditional and modern methods of software development are presented. PREREQ: INFO 4407 or CS 4451. PRE-or-COREQ: INFO 4430 or CS 4440. D

INFO 4484 Secure Software Life Cycle Development: 3 semester hours.
In today's interconnected world, security must be included within each phase of the software lifecycle. This course contains the largest, most comprehensive collection of best practices, policies, and procedures to ensure a security initiative across all phases of application development, regardless of methodology. PREREQ: INFO 4482. D

INFO 4486 Data Analytics: 3 semester hours.
Provides an overview of the fundamentals of analysis to support decision makers in achieving organizational results. Students become familiar with the tools needed to frame problems, analytical techniques to generate and test hypotheses, and the skills to interpret the results into meaningful information. PREREQ: MGT 2217. D

INFO 4487 Software Systems Study: 3 semester hours.
In addition to system optimization techniques, management strategies will be discussed. PREREQ: INFO 3307. D

INFO 4488 Informatics Senior Project: 3 semester hours.
Provides the knowledge and tools necessary to develop a physical design and an operational computerized system in a secure environment. The course will consider Secure Software Implementation/Coding, which involves secure coding practices, avoiding vulnerabilities, and reviewing code to ensure that there are no errors in the code or security controls. It will also cover Secure Software Testing, including integrated software testing for security, functionality, reliability, resiliency to attack, and recoverability. Software Acceptance will also be considered, such as reviewing security implications in the software acceptance phase including completion criteria, risk acceptance, and documentation, common criteria, and methods of independent testing. PREREQ: INFO 1182. PRE-or-COREQ: INFO 4430 and INFO 4482. D

INFO 4491 Seminar in Informatics: 3 semester hours.
Reading, discussion, and reporting on selected topics. May be repeated for up to 6 credits with permission of instructor. PREREQ: Senior status in Business and permission of instructor. D

INFO 4492 Special Problems in Informatics: 1-3 semester hours.
Research and reports on problems or topics in business informatics. Each project may be taken between 1-3 credits. May be repeated for up to 9 credits with different content. PREREQ: Senior status in Business and permission of the Chair. D

INFO 4493 Advanced Informatics Internship: 3 semester hours.
Significant business experience coordinated by the faculty to provide broad exposure to informatics issues. Letter grade assigned. F, S

INFO 4499 Experimental Course: 1-6 semester hours.
This course is not described in the catalog. The course title and number of credits are announced in the class schedule by the scheduling department. Experimental courses may be offered no more than three times.