Information Technology (IT)

IT 1100. Introduction to Unix/Linux. 3 Hours.
Required of all Computer and Information Technology majors, and open to students with a general interest in computer operating systems. Introduces operating system concepts, including file systems, process management, user management, and security. Students will install and configure LINUX and MAC OSX. **COURSE LEARNING OUTCOMES (CLOs) At the successful conclusion of this course, students will be able to: 1. Use basic Linux commands to interact with directories, files, processes, and the system. 2. Navigate the Linux filesystem hierarchy in order to create, delete, and manipulate files. 3. Manipulate files using a text editor from the command line. 4. Perform basic administration tasks 5. Identify Linux commands and their proper usage. FA, SP.

IT 1200. A+ Computer Hardware/Windows OS. 3 Hours.
This course covers installation, repair and maintenance of computer hardware. It also discusses installation, repair and maintenance of the Microsoft Windows operating system. This course prepares the student to take the CompTIA A+ certification exams. **COURSE LEARNING OUTCOMES (CLOs) At the successful conclusion of this course, students will be able to: 1.Select and configure PC computer hardware. 2. Install, repair and support PC computer hardware. 3. Install, repair and support the Microsoft Windows operating system. 4. Pursue the latest industry COMPTIA A+ certification. Course fee required. FA, SP.

IT 1500. Cloud Fundamentals. 1 Hour.
This course will provide students an introduction to the cloud. **COURSE LEARNING OUTCOMES (CLOs) At the successful conclusion of this course, students will be able to 1. Demonstrate knowledge of AWS Cloud concepts. 2. Create and utilize cloud resources. 3. Apply security and compliance knowledge within the AWS Cloud. 4. Describe the core AWS services. 5. Explain the economics of the AWS Cloud. Course Fee required. FA, SP.

IT 2300. Database Design & Management. 3 Hours.
Covers administration of database management systems, logical database design, implementation of database designs, and application development using a DBMS. Students will design, manage, and implement databases and applications that use databases. **COURSE LEARNING OUTCOMES (CLOs) At the successful conclusion of this course, students will be able to: 1. Design an effective database system. 2. Demonstrate the proper use of database normal forms. 3. Demonstrate the proper use of the SQL programming language. Course fee required. Prerequisites: CS 1400 (Grade C or higher) AND IT 1100 (Grade C or higher); OR CS 1410 (Grade C or higher). FA, SP.

IT 2400. Intro to Networking. 3 Hours.
Required of all Computer Science and Computer and Information Technology majors, and open to students with a general interest in computer networking. Introduces fundamental concepts of computer networks, including physical, transport, and application layers through completion of assignments predicting and measuring the behavior of computer networks under various conditions. IT 1100 and IT 1500 can be taken concurrently. **COURSE LEARNING OUTCOMES (CLOs) At the successful conclusion of this course, students will be able to: 1. Pursue the CompTIA Network + certification. 2. Explain how the Internet works. 3. Design, connect and implement a computer network. 3. Define and use several different Internet protocols. 4. Describe the TCP/IP and OSI protocol stacks and what happens at each layer. 5. Use networking tools to troubleshoot network problems. Course fee required. Prerequisites: IT 1100 (Grade C or higher) (can be taken concurrently); AND IT 1500 (Grade C or higher) (can be taken concurrently). FA, SP.

IT 2500. Cloud Computing. 3 Hours.
Cloud Architecting covers the fundamentals of building IT infrastructure on Amazon Web Services and other cloud providers. The course is designed to teach solutions architects how to optimize the use of the Cloud by understanding cloud services and how these services fit into cloud-based solutions. Because architectural solutions can differ depending on industry, type of applications, and size of business, this course emphasizes best practices for the cloud, and it recommends various design patterns to help you think through the process of architecting optimal IT solutions. It also presents case studies throughout the course, which showcase how some cloud customers have designed their infrastructures, and the strategies and services that they implemented. Finally, this course also provides opportunities to build a variety of infrastructures via a guided, hands-on approach. **COURSE LEARNING OUTCOMES (CLOs) At the successful conclusion of this course, students will be able to: 1. Discuss cloud-based concepts and terminology. 2. Evaluate business needs and propose cloud solutions. 3. Utilize current cloud technologies to develop and implement computing solutions. 4. Demonstrate proficiency by passing an AWS accreditation exam. Course fee required. Prerequisites: IT 2400 (Grade C or higher) and IT 1500 (Grade C or higher). FA.

IT 2700. Information Security. 3 Hours.
Required of students pursuing an Information Technology emphasis. Reviews current security exploits, vulnerabilities, and counter measures. Covers general security models and architectures, encryption and forensics. **COURSE LEARNING OUTCOMES (CLOs) At the successful conclusion of this course, students will be able to: 1. Demonstrate competency by pursuing the CompTIA Security+ certification (SY0-501). 2. Describe the fundamentals of Information Security. 3. Identify security vulnerabilities in networks, operating systems, and other computer-related environments. 4. Explain the legal and ethical aspects of computer security. 5. Respond to active and passive security attacks. Course fee required. Prerequisites: CS 1400 (Grade C or higher); AND IT 2400 (Grade C or higher). FA, SP.

IT 3001. Info Sys and Analytics Intermediate Career Strategies. 1 Hour.
Business Foundations, with emphasis placed on executing successful and focused career research in Information Systems and Analytics. Target industry sector(s) and specific opportunities within preferred sector(s) will be identified. Professional networking skills will be developed. Students will put together their career strategy document that includes short and long term career goals, and an implementation plan for achieving those goals. Students will update their career portfolio to match their career strategy. It is recommended that students take this course prior to their senior year. Dual listed with ACCT 3001 and FIN 3001 (students may only take one course for credit). **COURSE LEARNING OUTCOMES (CLOs) At the successful conclusion of this course, students will be able to: 1. At the successful conclusion of this course, students will be able to: 1. Conduct a targeted career search related to individual skills, interest, and current career opportunities. 2. Create and maintain a professional network that will support a targeted career search. 3. Create a customized resume for each identified career opportunity. 4. Create a Personal Career Portfolio, presenting academic work product germane to their targeted career search. 5. Demonstrate a professional manner during phone and personal interviews. Prerequisites: Recommended SSC 1010, or BUS 1050, or BUS 2000. FA, SP.

IT 3100. Systems Design and Administration. 3 Hours.
Required of Computer and Information Technology majors and students with an emphasis in Information Technology. Covers system administration topics for managing Internet facing services, including DNS, SMTP, and HTTP. Students will install, configure, and test services in a server environment. **COURSE LEARNING OUTCOMES (CLOs) At the successful conclusion of this course, students will be able to: 1. Perform a system installation. 2. Perform user and filesystem administration. 3. Perform configuration of DNS, web, email and database services. 4. Utilize best practice security principles by securing various services. Course fee required. Prerequisites: CS 1400 (Grade C or higher) AND IT 2400 (Grade C or higher) AND IT 1100 (Grade C or higher); OR IT 1100 (Grade C or higher) AND CS 3150 (Grade C or higher). FA.

IT 3110. System Automation. 3 Hours.
Enhances student administrative skills by promoting use of programming structures to manipulate, configure, and maintain systems. Image creation, collection, and dissemination will also be covered. **COURSE LEARNING OUTCOMES (CLOs) At the successful conclusion of this course, students will be able to: 1. Provision a DHCP server and automate clients to interact with DHCP server. 2. Provision, configure, and manage systems through the use of automated scripts and tools. 3. Capture and deploy operating system images without manual intervention. 4. Collect and rotate logs from various servers in a central location. 5. Develop scripts that will automate various tasks. Course fee required. Prerequisites: IT 3100 (Grade C or higher) AND CS 1410 (Grade C or higher). SP.

IT 3150. Windows Servers. 3 Hours.
Students will learn Window's server management techniques to support a small to medium-sized business. Topics covered will include DHCP, DNS, IT, Windows Roles, Workgroups, Active Directory, and Domain Management. File and printer sharing will also be discussed. **COURSE LEARNING OUTCOMES (CLOs) At the successful conclusion of this course, students will be able to: 1. Install and configure Windows Server. 2. Configure communication and replication between Windows servers. 3. Deploy, integrate and configure Hyper-V into the network. 4. Describe the purposes and implementations of various Windows Server roles, role services and features. 5. Install and configure Active Directory. 6. Implement and deploy Group Policies. 7. Pursue the Microsoft Installing and Configuring Windows Server (70-740) certification exam. Course fee required. Prerequisites: IT 2400 (Grade C or higher). SP.

IT 3300. DevOps Virtualization. 3 Hours.
Full Operating System virtualization as well as container or application virtualization topics will be covered. Automated deployment using configuration files. Management topics such as load-balancing, auto-failover, and high availability will also be discussed. **COURSE LEARNING OUTCOMES (CLOs) At the successful conclusion of this course, students will be able to: 1. Manage and configure enterprise virtualization requirements. 2. Describe and explain the different types of virtualization. 3. Develop and provide redundancy and failover solutions for virtual environments, practice migration. 4. Write automated deployment scripts to provide virtual environments. Course fee required. Prerequisite: IT 2400 (Grade C or higher); OR IT 1100 (Grade C or higher) AND CS 3150 (Grade C or higher). FA.

IT 3400. Intermediate Computer Networking. 3 Hours.
Building upon basic networking concepts, this course covers VPNs, remote connectivity, mobile networking, unified communication, IoT hardening and network monitoring. Hands on labs are a significant portion of the course. At the end of this course, students will be ready for the CompTIA Network+ certification exam. **COURSE LEARNING OUTCOMES (CLOs) At the successful conclusion of this course, students will be able to: 1. Describe and configure virtual private networks. 2. Design, deploy and manage Virtual LANs. 3. Classify and summarize WAN technologies such as SONET, MPLS, and remote access methods. 4. Manage and secure mobile and IoT devices on the network. 5. Deploy and administer network monitoring tools. 6. Prepare for and pass the CompTIA Network+ Certification exam. Course fee required. Prerequisites: IT 2400 (Grade C or higher). SP.

IT 3710. Network Defense. 3 Hours.
This course provides students with a general understanding of how to install, configure, and manage a next generation firewall (NGFW) for defense of enterprise security network architecture. Students will learn the configuration and management steps for setting up the security, networking, accounts, zones, and security policies of NGFW technologies. **COURSE LEARNING OUTCOMES (CLOs) At the successful conclusion of this course, students will be able to 1. Demonstrate and apply firewall initial access, interfaces, and security zones. 2. Configure and manage virtual routing, filtering, licensing, service routes, software updates, and policy based forwarding on NGFWs. 3. Analyze security policy administrative concepts related to source and destination network address translation. 4. Outline and construct security policies to identify known and unknown application software running on the service network. 5. Configure the firewall to block traffic from malicious IP addresses, domains, and URLs. Prerequisites: IT 2700 (Grade C- or higher). SP.

IT 4060. Big Data Analytics. 3 Hours.
Course focuses on a theoretical and hands-on exploration of business intelligence and analytics. It covers current best practices in statistical and quantitative analysis using large-scale data sets, exploratory and predictive models, and evidence-based methods to improve business decisions and actions. Dual listed with ISA 4060 (students may only take one course for credit). **COURSE LEARNING OUTCOMES (CLOs) At the successful conclusion of this course, students will be able to: 1. Identify the key components and concepts associated with big data analytics. 2. Apply big data and statistical best practices to collect, cleanse, transform, and store large-scale data for subsequent analysis. 3. Analyze large-scale data sets to identify hidden patterns. 4. Evaluate data models using best practices. 5. Create recommendations for improving business decisions based on the data analysis. Course fee required. Prerequisites: STAT 2040 (Grade C or higher); OR MATH 1040 (Grade C or higher). FA.

IT 4070. Data Visualization and Storytelling. 3 Hours.
A focus on the methods, tools and processes to effectively visually encode and present insights discovered from previously analyzed data. It includes practice transforming simple and complex data analysis outputs into relevant, accurate, and effective visual displays to improve communication and decision making. Dual listed with ISA 4070 (students may only take one course for credit). **COURSE LEARNING OUTCOMES (CLOs) At the successful conclusion of this course, students will be able to: 1. Identify the key components and concepts associated with data visualization. 2. Recognize the ethical and financial consequences of poor data visualization techniques. 3. Differentiate between effective and ineffective methods in data analysis reporting. 4. Create graphically encoded data into useful formats from previously analyzed data. 5. Demonstrate the accurate communication of statistical findings for real world big data problems to decision makers with diverse skill levels. SP.

IT 4100. Files Systems and Storage Technologies. 3 Hours.
Classic, virtualized, and cloud storage will be covered. Topics such as RAID, NAS, SAN will be covered. Business continuity for backup and replication of storage. Local vs. Remote file systems. We will explore older and newer OS filesystems and compare them (such as fat32, ntfs, ext3, ext4, btrfs). **COURSE LEARNING OUTCOMES (CLOs) At the successful conclusion of this course, students will be able to: 1. Evaluate key filesystems technologies (both local and remote) and implement these filesystems. 2. Evaluate storage architectures and key data center elements in classic, virtualized, and cloud environments. 3. Explain physical and logical components of a storage infrastructure including storage subsystems, RAID, and intelligent storage systems. 4. Articulate business continuity solutions backup and replication, and archive for managing fixed content. Course fee required. Prerequisites: IT 3100 (Grade C or higher).

IT 4200. DevOps Lifecycle Management. 3 Hours.
Takes students through the DevOps lifecycle. Students will develop practical skills in continuous integration, cloud provisioning, configuration management, continuous deployment, continuous monitoring, and continuous feedback. **COURSE LEARNING OUTCOMES (CLOs) At the successful conclusion of this course, students will be able to: 1. Describe and configure continuous integration. 2. Describe and configure continuous delivery. 3. Use automated tools for provisioning and configuration. 4. Utilize a version control system. Course fee required. Prerequisites: CS 1400 (Grade C or higher) AND IT 2400 (Grade C or higher); OR CS 2810 (Grade C or higher). FA.

IT 4310. Database Administration. 3 Hours.
This course covers the database architecture and environment. Students will be able to manage user access control. Students will be able to perform backup, restore, and recovery operations. Students will be able control performance and optimization issues. It covers updating and upgrading of a database system. Students will be able to perform the importing and exporting of data to/from a database. Dual listed with CS 4310 (only one course may be taken for credit). **COURSE LEARNING OUTCOMES (CLOs) At the successful conclusion of this course, students will be able to: 1. Manage and organize data into a database. 2. Backup and restore a database. 3. Tune a database for better performance. 4. Import/export data to and from a database. Course fee required. Prerequisites: IT 2300 (Grade C or higher). FA.

IT 4400. Network Design & Management. 3 Hours.
Required of students pursuing an Information Technology emphasis. Covers the design, management, and monitoring of a network. Hands-on configuration experience of layers 1, 2, and 3 will be given on both LAN and WAN levels. The successful student will be prepared to successfully complete the CCNA exam. **COURSE LEARNING OUTCOMES (CLOs) At the successful conclusion of this course, students will be able to: 1. Create and assign subnets and vlans. 2. Manage Cisco Devices. 3. Manage a small network. 4. Explain and Implement different routing protocols. Course fee required. Prerequisites: IT 3400 (Grade C or higher). FA.

IT 4510. Ethical Hacking & Network Defense. 3 Hours.
This course provides an in-depth, hands-on experience in effectively protect networks. Students will learn the tools and penetration testing methodologies used in ethical hacking. Additionally, cyber-ethics regarding piracy, intellectual property, and fair information practices will be discussed along with state, federal, and international laws governing information technology. **COURSE LEARNING OUTCOMES (CLOs) At the successful conclusion of this course, students will be able to: 1. Define ethical hacking. 2. Analyze threat vectors and proper defense mechanisms against them. 3. Examine emerging areas of cloud, development, and mobile hacking. 4. Develop defense skills against malware, DoS, backdoors and more. Course fee required. Prerequisites: CS 1410 (Grade C or higher); AND IT 3100 (Grade C or higher). SP.

IT 4600. Senior Capstone. 3 Hours.
Required of students pursuing an Information Technology emphasis. Students will obtain industry-level certifications. **COURSE LEARNING OUTCOMES (CLOs) At the successful conclusion of this course, students will be able to: 1. Prepare for and pass industry-level certifications. 2. Demonstrate interactive skills by participating in mock interviews. Course fee required. Prerequisites: Advanced Standing. SP.

IT 4910R. Special Topics in Applied Technology. 3 Hours.
For students wishing instruction that is not available through other regularly scheduled courses in this discipline. Students fill the requirements of this course by completing coursework provided by external curriculum providers. Repeatable for credit for multiple courses without substantial overlap. Prerequisites: Instructor permission.

IT 4920R. Internship. 1-3 Hours.
Internship course in Information Technology. Variable credit 1.0 - 3.0. Repeatable up to 3 credits subject to graduation restrictions. **COURSE LEARNING OUTCOMES (CLOs) At the successful conclusion of this course, students will be able to: 1. Apply IT skills in producing an IT project in a real world environment. 2. Design a real IT project that follows budget, timeline and technology guidelines and restrictions. 3. Collaborate with IT supervisors, team leaders and team members in an IT project. 4. Align an IT project with stated business objectives. 5. Analyze a project outcome to improve future efficiency and innovation. 6. Present a comprehensive project refection report comparing objectives to outcomes. Prerequisite: Instructor permission. FA, SP, SU.

IT 4990. Special Topics in Information Technology. 0.5-3 Hours.
For students wishing instruction that is not available through other regularly scheduled courses in this discipline. Occasionally, either students need some type of non-traditional instruction, or an unanticipated opportunity for instruction presents itself. This course may include standard lectures, travel and field trips, guest speakers, laboratory exercises, or other nontraditional instruction methods. Repeatable for credit as topics vary, up to 12 credits. Offered by arrangement. **COURSE LEARNING OUTCOMES (CLOs) At the successful conclusion of this course, students will be able to: 1. Demonstrate learning through original and creative ideas. 2. Use appropriate strategies and tools to represent, analyze, and integrate seminar-specific knowledge. 3. Develop the ability to think critically about course content. 4. Apply knowledge from seminar to a range of contexts, problems, and solutions. Course fee required. Prerequisite: Instructor permission.

IT 4991. Seminar in Information Technology. 0.5-3 Hours.
For students wishing instruction that is not available through other regularly scheduled courses in this discipline. Occasionally, either students request some type of non-traditional instruction, or an unanticipated opportunity for instruction presents itself. This seminar course provides a variable credit context for these purposes. As requirements, this seminar course must first be pre-approved by the department chair; second, it must provide at least nine contact hours of lab or lecture for each credit offered; and third, it must include some academic project or paper (i.e., credit is not given for attendance alone). This course may include standard lectures, travel and field trips, guest speakers, laboratory exercises, or other nontraditional instruction methods. Note that this course in an elective and does not fulfill general education or program requirements. Fees may be required for some seminar courses and instructor permission will be optional at the request of the instructor. **COURSE LEARNING OUTCOMES (CLOs) At the successful conclusion of this course, students will be able to: 1. Develop and build computerized systems using a specific methodology or set of tools. 2. Extrapolate the specialized insights and practices of a specific computational system to a wider field of practice. 3. Apply general purpose problem skills in system construction and problem solving to a specific problem domain.