Course Descriptions

CS 101  Intro to Computer Science 3 credits
An introduction to computer science concepts and the role of computers in society. Topics include the history of computing, computer hardware, operating systems, the Internet, database management, an overview of programming languages and logic, careers in computer technology, and the ethics of computing. This course is designed for Computer Science majors, and will emphasize principles and underlying computer technology concepts.
Prerequisite:  None (F, W, S, SU)

CS 104 Intro to Computer Hardware 3 credits
This course covers basic concepts of computing hardware and addresses the impact of hardware design on applications and systems software. Students will learn how computers work and be able to replace parts and upgrade components. Students completing CS 104 and CS 105 will have the knowledge and skills necessary for CompTIA A+ Certification exam preparation.
Prerequisite:  None (F, S)

CS 105  Intro to Operating Systems 3 credits
An introduction to operating systems (O/S) design, structure, and mechanisms. Topics include computer software systems performance, memory, kernel structure, input/output (I/O) devices, file system functions, virtualization, and securing the operating system. Students will install and configure major modern client operating systems. Students completing CS 104 and CS 105 will have the knowledge and skills necessary for CompTIA A+ Certification exam preparation.
Prerequisite:  None (F, S)

CS 106  Intro to Virtualization 5 credits
This introductory course is an overview and hands-on exploration of virtualization in desktop, server, and cloud environments. Concepts covered include an introduction to virtualization technologies and how to deploy and manage a virtual server environment. Course topics include virtualization concepts and terms, installing and deploying virtual machines using Hyper-V, VM Ware, and XenServer, and implementing a secure virtual environment.
Prerequisite:  CS 105 (F)

CS 110  Networking Fundamentals 3 credits
An introduction to the basic concepts of computer networking, including: the OSI model, working with network-related hardware, network configuration with TCP/IP, network operating system basics, fault tolerance issues, and troubleshooting network problems. The course prepares students for the CompTIA Network+ certification exam.
Prerequisite:  None (F, S)

8/7/2014
CS 111  Intro to Programming  
An introductory programming course using the .NET language to create event-driven programs with a graphical user interface. Topics include variables, control structures, loops, object-oriented programming techniques, forms, debugging, and an introduction to database programming using ADO.NET and SQL. 
Prerequisite: MPC 095/096 or concurrent enrollment (F, S)

CS 115  Intro to Database Design and Management  
This course will examine the theory of database design and management, including how collections of data are organized, stored, and analyzed. Topics include the fundamentals of the relational model, Structured Query Language (SQL), data modeling, database design and administration, and web database processing. Introductory business and financial services applications will be used to illustrate course concepts through lectures and hands-on labs. 
Prerequisite: None (W)

CS& 131  Computer Science I: C++  
An introduction to computer programming design and development with a primary focus on data structures and abstraction using the C++ object-oriented programming language. Topics include logical problem-solving, algorithm development, and programming basics, including an understanding of pointers, dynamic memory allocation, and data structures such as linked lists. 
Prerequisite: MATH& 141 or concurrent enrollment

CS 132  Advanced Programming with C++  
This course expands on the fundamentals covered in CS& 131. Students will develop intermediate C++ programs for both traditional data processing and object-oriented applications. Through the experience of creating these programs and methods the student will learn advanced features of C++ object-oriented programming to solve problems in various domains. 
Prerequisite: CS& 131

CS 136  Intro to Database Programming  
This course examines introductory concepts of relational database theory and applies these skills in client-server database design and management using SQL. Focus is on discussion of relational database theory, object-oriented and physical database design, the concepts of data normalization and data design, implementation of data designs, procedural programming via the SQL environment between backend databases and user environments, and information storage and retrieval. 
Prerequisite: CS 115 or instructor permission (S)

CS& 141  Computer Science I: Java  
This course introduces students to the fundamental concepts of object-oriented programming with the Java programming language. The course will focus on the strengths of Java to create classes, objects and methods, algorithm development, program solving techniques, basic control structures, primitive types, and arrays. Students will master the basics of Java, developing solid programming skills that enable crossover programming skills for other essential languages. 
Prerequisite: MATH& 141 or concurrent enrollment (F)
CS 142  Advanced Programming with Java  
Advanced Java is a follow-up to the programming concepts introduced in the Java I course. This course explores Java’s Distributed Applications features and covers inheritance, exceptions, graphical user interfaces, recursions, and data structures. (W)
Prerequisite:  CS& 141

CS 156 Cisco Networking: Introduction to Networks  
Introduces the architecture, structure, functions, components, and models of the Internet and computer networks. The principles of IP addressing and fundamentals of Ethernet concepts, media, and operations are introduced. Students will be able to build simple LANs, perform basic configurations for routers and switches, and implement IP addressing schemes. This is the first of two courses comprising the Cisco CCENT certification and covers the technical knowledge and skills required to take the Cisco ICND1 exam.
Prerequisite:  CS 104, CS 105

CS 157 Cisco Networking: Routing & Switching Essentials  
Describes the architecture, components, and operations of routers and switches in a small network. Students learn how to configure a router and a switch for basic functionality. By the end of this course, students will be able to configure and troubleshoot routers and switches and resolve common issues with RIPv1, RIPv2, single-area and multi-area OSPF, virtual LANs, and inter-VLAN routing in both IPv4 and IPv6 networks. This is the second of two courses comprising the Cisco CCENT certification and covers the technical knowledge and skills required to take the Cisco ICND1 exam.
Prerequisite:  CS 156

CS 158 Cisco Networking: Scaling Networks  
Describes the architecture, components, and operations of routers and switches in a large and complex network. Students learn how to configure routers and switches for advanced functionality. By the end of this course, students will be able to configure and troubleshoot routers and switches and resolve common issues with OSPF, EIGRP, STP, and VTP in both IPv4 and IPv6 networks. Students will also develop the knowledge and skills needed to implement DHCP and DNS operations in a network.
Prerequisite:  CS 157

CS 159 Cisco Networking: Connecting Networks  
Discusses the WAN technologies and network services required by converged applications in a complex network. The course enables students to understand the selection criteria of network devices and WAN technologies to meet network requirements. Students learn how to configure and troubleshoot network devices and resolve common issues with data link protocols. Students also develop the knowledge and skills needed to implement IPSec and virtual private network (VPN) operations in a complex network.
Prerequisite:  CS 158

CS 161 Intro to Website Design & Publishing  
This course covers the technical knowledge and skills needed to design and publish a web site. Students create web pages with the latest standards of XHTML, HTML5, and Cascading Style Sheets (CSS) with an emphasis on coding web pages that work in both current and future browsers. Topics include web design principles, website development, web authoring standards, configuring images and multimedia on web pages, and website publishing. Prerequisite:  None (W)
**CS 162 Programming with JavaScript**

This course focuses on the fundamental concepts of the JavaScript language to create interactive websites. Students learn how to use JavaScript to communicate with users, modify the Document Object Model (DOM), control program flow, validate forms, animate images, create cookies, modify attributes and values in X/HTML using DOM elements, use JavaScript libraries, incorporate AJAX into JavaScript code, communicate with databases, and debug and troubleshoot JavaScript.

Prerequisite: None

**CS 195 Internship: Work Based Learning**

Students will participate in a supervised internship with regional computer and information technology employers. Students are expected to develop a computer science career-based portfolio and employment resume. Course may be repeated up to a maximum of 4 credits.

Prerequisite: Enrollment in Computer Science program, instructor permission, and concurrent enrollment in CS 197 (F, W, S, SU)

**CS 197 Internship: Work Based Learning Seminar**

Students participating in internships share feedback and discussion to integrate work-based learning experiences with classroom instructions. Students are expected to submit weekly work journals and develop a computer science career-based portfolio and employment résumé. Course may be repeated up to a maximum of 4 credits.

Prerequisite: Concurrent enrollment in CS 195 (F, W, S, SU)

**CS 205 Windows Server Administration**

This course focuses on Windows Server Administration. Topics include the communication, design and implementation of the Active Directory, DNS, Group Policy Objects, disaster recovery, configuring the web server, security, and working knowledge of Microsoft Exchange.

Prerequisite: CS 105 (W)

**CS 206 Linux Server Administration**

In this course students will customize the BASH environment, build shell scripts in the Korn shell, control the Linux system, manage user accounts, manage system software in Linux, and manage file systems in Linux. Students will also troubleshoot the system, configure the client/server environment, apply security practices to Linux systems, and improve system performance.

Prerequisite: CS 105, CS 205 recommended (S)

**CS 207 Intro to Security Administration**

Students will acquire the specific skills required to implement basic security services on computers and networks. This course builds on prior course work in computer hardware, operating systems, and networks and prepares students to take the CompTIA Security+ exam.

Prerequisite: CS 105; CS 205 recommended (S)

**CS 235 Data Structures and Algorithms**

Basic data structures such as stacks, queues, linked lists, and trees are studied and applied to problems in data storage and manipulation. Applications include basic searching and sorting algorithms. Design, analysis and implementation techniques are discussed to illustrate the concepts of the course through lectures and hands-on labs.

Prerequisite: CS 142

8/7/2014
CS 250  Software Development & Design *pending*  
Prerequisite: CS111 or CS& 131 or CS& 141

5 credits

CS 251  Advanced Programming with C#  
This course covers design and programming concepts using C#. Students will learn the fundamental skills required to design and develop object-oriented applications for the Web and Microsoft Windows by using Microsoft C# and the Microsoft Visual Studio .NET development environment.
Prerequisite: CS 111

5 credits

CS 260  Computer Programming Topics  
This course highlights a new emerging software development, programming language, cloud computing, web application, or mobile application topic. In consultation with their Computer Science program advisor, students choose a specialized or in-depth programming related project and apply new and emerging computing and information technologies. Completed projects are presented and shared with fellow students.
Prerequisite: CS 111 or instructor approval

5 credits

CS 262  Programming Dynamic Websites  
This course covers dynamic web programming to build interactive, database driven websites. Students gain experience using core ASP.NET, Microsoft SQL, JavaScript, and CSS technologies to add power and functionality to Web sites. A major emphasis of the course is building, manipulating, and creating output from a database to a Web page.
Prerequisite: CS 115 and CS 161 (F)

5 credits

CS 265  Web Applications Design & Development  
This course provides students the knowledge and skills to design and develop dynamic web applications. Using ASP.NET and Ajax, students design, create, and test web pages, create a web interface to a database, and build applications for the web and mobile devices.
Prerequisite: CS 111 or CS 251, and CS 161 (W)

5 credits

CS 270  Web Architecture & Client Services  
This course introduces students to the core standards that enable Web Services and the developer’s task of architecting and implementing enterprise systems. Service-Oriented Architecture provides the availability of web-based services and is changing the way developers create programs and the speed at which they deploy solutions. Also covered is cloud-based hardware and software platforms and the cloud computing concepts of Software as a Service (SaaS), Platform as a Service (PaaS), data storage, security, and other related client services.
Prerequisite: CS 161 (S)

5 credits

CS 271  Web Graphics  
This course covers image processing techniques using Adobe Photoshop to prepare images and create interactive visuals that are integrated into dynamic websites. Students learn the essentials in correcting, editing, sharpening, retouching, and presenting photos, focusing on essential digital photography and graphic design techniques.
Prerequisite: CS 161 (W)

5 credits
CS 289  Project Management for Computer Science  5 credits
This capstone course is intended for Computer Science program students and is focused on understanding and exercising principles distinctive to managing information technology projects. Students develop skills in project integration, scope, time, cost, quality, human resource, communications, risk, procurement, and stakeholder management. Working as a team, students will select a final project that may focus on their area of specialization in software development, systems administration, or web development and design.
Prerequisite: Completion of 30 computer science credits or instructor permission (S)

CS 295 Internship II  1-4 credits
Students will participate in an advanced internship with regional computer and information technology employers.
Prerequisites: CS 195, CS 197, and instructor permission (F, W, S, SU)

CS 297 Internship II Seminar  1 credit
Continuation of internship work based learning seminar. Students will provide feedback and discussion to integrate and relate internship/work-based learning and classroom instruction.
Prerequisites: CS 197 and instructor permission (F, W, S, SU)