COMPUTER SCIENCE (CS)

CS-185 Programming Foundations II (4 Credits)
This course extends the ISCS-140 concepts to include more advanced programming concepts and principles such as: Arrays of Objects; Inheritance, Polymorphism, and Amalgamation; Exception Handling; External File Processing; Basic GUI Programming; Creating User Interfaces; Introduction to Data Structures.
Prerequisite(s): Grade of C or higher in ISCS-140
Offered: All, Every Year

CS-215 Operating System Administration (4 Credits)
Discusses fundamental system administration issues using the Unix operating system and/or any other operating system chosen by the instructor. It covers installation and configuration, file and directory management, message management, management of system security, multimedia management, basic network configuration, and command language programming.
Prerequisite(s): CS-185 or ISCS-210
Offered: Spring, Every Year

CS-225 C++ Programming (4 Credits)
This course introduces the student to fundamental programming concepts with the C++ programming language. It includes concepts such as sequence, iteration, conditional branching, functions, recursion, function overloading, object orientated programming, operator overloading, file processing etc. It also includes a cursory treatment of fundamental data structures.
Prerequisite(s): C or higher grade in CS-185
Offered: Fall, Every Year

CS-265 Computer Architecture (4 Credits)
Introduces the student to the computer as an electronic device. It includes digital logic as well as design of critical internal components of the computer system. May also include topics such as hardware compilation, microcode, content-addressable memories, and parallel architectures.
Prerequisite(s): Grade C or higher in ISCS-140 and MATH-135
Offered: All, Every Year

CS-280 Data Structures & Algorithms (4 Credits)
This course guides the student through a study of data structures and algorithms. It includes algorithm development and analysis, array-lists, linked lists, stacks, queues, trees hashing, graphs, and sorting algorithms. Although Java will be the primary programming language, the material is covered in a manner that facilitates implementation in any language.
Prerequisite(s): Grade C or higher in CS-185 and MATH-135
Offered: All, Every Year

CS-290 Special Topics (1-4 Credits)
Elementary topics as determined by changes taking place in the discipline. Repeatable as topics change.
Prerequisite(s): Minimum of 8 credits in CS
Offered: All, Every Year

CS-293 Supervised Field Experience (1-2 Credits)
Allows students to participate in field experience, combining theory with practice.
Prerequisite(s): 16 credits in CS and permission of instructor
Offered: All, Every Year

CS-294 Cooperative Education (1-4 Credits)
Introductory work learning experience related to career interests for which compensation may be received. Positions arranged by students with sponsorship, approval, and evaluation by fulltime faculty. Graded Pass/Fail.
Prerequisite(s): 8 credits in CS and permission of instructor
Offered: All, Every Year

CS-297 Internship (1-4 Credits)
Introductory work learning experience related to career interests for which compensation may be received. Positions arranged by students with sponsorship, approval, and evaluation by fulltime faculty. Graded Pass/Fail.
Prerequisite(s): 8 credits in CS and permission of instructor
Offered: All, Every Year

CS-320 Operating Systems Design (4 Credits)
Discusses the intricacies of operating systems design and implementation. Areas of concentration include OS services, file management, CPU scheduling, memory management, input/output management, resource allocation, security, and process management.
Prerequisite(s): CS-280
Offered: Spring, Every Year

CS-355 Computer Networks (4 Credits)
Introduction to fundamental concepts in the design and implementation of computer networks, their protocols and applications, examining the application layer and working down toward the link layer. Emphasis on networking concepts and issues involved in creating network applications and application-level protocols using network programming.
Prerequisite(s): CS-185 or ISCS-210
Offered: Spring, Every Year

CS-360 Database Systems (4 Credits)
This course covers the theoretical foundation of modern database systems, concentrating on practical use of relational database management systems to model, design and implement business and commercial systems. It includes Structured Query Language (SQL), normalization, and rational algebra. It does not use any specific language.
Prerequisite(s): Grade C or higher in CS-280
Offered: Fall, Every Year

CS-375 Software Engineering (4 Credits)
This course introduces the fundamental concepts and principles of software planning, construction, implementation and management. It covers the software development life cycle and the various activities that occur. It also covers methodologies for specifying, designing, developing, and managing top quality software systems.
Prerequisite(s): CS-280
Offered: Fall, Every Year

CS-395 Mobile Device App Programming (4 Credits)
This is an introductory course in creating applications for mobile devices including Android, iPhones, iPads, and the iPod Touch. It teaches students how to conceive, design, construct, and deploy applications for mobile devices. It employs Xcode (Apples native IDE), the Objective-C programming language, and the Cocoa Touch framework.
Prerequisite(s): CS-185
Offered: All, Every Year

CS-420 E-Commerce Development (4 Credits)
Covers e-business development using both conceptual and hands-on orientations. Includes significant web-page construction using PHP, PHP frameworks, Model-View-Controller architecture, server and security implementation and customization, interface and connectivity with backend databases using MYSQL.
Prerequisite(s): ISCS-150 & CS-185
Offered: Fall, Every Year

CS-430 Principles of Programming Languages (4 Credits)
This course guides the student through a comparative study of programming languages, guided by a well defined set of criteria. It includes an introduction to the fundamentals of programming language design, review of different types of programming languages, formal language theory, theory of computation, and principles/concepts of programming language construction.
Prerequisite(s): CS-265 and CS-280
Offered: Spring, Every Year

CS-455 Cryptography & Network Security (4 Credits)
Introduction to fundamental concepts and techniques underlying the science and art of cryptography and network security including: symmetric encyption, message digests, public key cryptography, authentication, security protocols on both application and network layers of the Internet, and network operational security techniques.
Prerequisite(s): CS-355
Offered: Fall, Every Year

CS-480 Machine Learning (4 Credits)
Students will learn the fundamentals of machine learning, pattern recognition and predictive analytics. They will learn to use Python Machine Learning libraries to build algorithms on big data to make useful predictions. This knowledge is foundational to the Artificial Intelligent systems, such as autonomous car and automated medical diagnosis tools.
Prerequisite(s): Take ISCS-210 and MATH-141
Offered: Fall, Every Year

CS-490 Advanced Special Topics (1-4 Credits)
Advanced topics as determined by changes taking place in the discipline. Repeatable as topics change.
Prerequisite(s): Minimum of 32 credits in CS

CS-493 Adv Supervised Field Experienc (1-4 Credits)
Allows students to participate in field experience, combining theory with practice. May be repeated for up to 8 credits.
Prerequisite(s): 16 credits in CS and permission of instructor
Offered: All, Even Years

CS-494 Advanced Cooperative Education (1-4 Credits)
Sequential work learning experience for which compensation may be received. Placements are arranged, supervised, and evaluated by full time faculty. May be repeated for a total of 4 credits. Graded Pass/Fail.
Prerequisite(s): 16 credits in CS, and permission of instructor
Offered: All, Every Year

CS-495 Artificial Intelligence & Robotics (4 Credits)
Introduces the fundamental issues in artificial intelligence (AI). Includes fundamental concepts, problem-solving techniques (including breadth-first search, depth-first search, Heuristic search, greedy best-first search, hill-climbing search, A star search), and a project-oriented coverage of robotics that requires each student to design and program a robot.
Prerequisite(s): CS-280
Offered: Spring, Every Year

CS-497 Advanced Internship (1-4 Credits)
Sequential work-learning experience for which compensation may be received. Placements are arranged, supervised, and evaluated by full-time faculty. May be repeated for a total of 4 credits. Graded Pass/Fail.
Prerequisite(s): 16 credits in CS, and permission of instructor

CS-498 Independent Study (1-4 Credits)
Individual research into selected topics in computer studies under the direction of a faculty member. May be repeated to a total of 4 credits. A maximum of 4 credits may be applied to the upper level (300 and 400) CS elective requirement.
Prerequisite(s): 16 credits in CS and consent of the instructor who will supervise the independent study

IICS-350 Cybercrime (4 Credits)
An introduction to cybercriminal activities from the perspective of computer forensics, sociology, criminal justice studies, in non-technological language while examining all basics on investigation and prosecution. Emphasis on both traditional and new forms of computer crime such as unauthorized access, online fraud, e-fencing, fraudulent instruments, identity theft, and many others.
Prerequisite(s): 24 credits in ISP including ITW-101 and QL
Offered: Summer, Every Year

INCS-160 Microcomputer Systems (4 Credits)
This introductory course in microcomputer systems includes discussion of the underlying physics of the computer system, hardware/software installation, configuration, trouble shooting problems, networking essentials, and other related topics. The course is designed to prepare students to develop an understanding of the internal workings of a microcomputer system. Not open to students who have completed CS-160.
Offered: All, Every Year

ISCS-140 Programming Foundations I (4 Credits)
Introduces students to fundamental computer science (CS) principles that help prepare students for successful careers in their chosen disciplines. Topics include: hardware & software fundamentals; algorithm development fundamentals; introduction to Java programming; control structures; construction of classes and methods; array processing; introduction to inheritance; interfaces. Not open to students who have completed CS-140.
Offered: All, Every Year

ISCS-150 Website Design & Construction (4 Credits)
Introduces website construction as a pervasive means of problem solving and communication. Through the various methodologies covered, the course helps students prepare for successful careers in their chosen disciplines. Topics include: fundamentals of website design; Hypertext Markup Language (HTML); introduction to Extensible Markup Language (XML); other supporting methodologies. Not open to students who have completed CS-150.
Offered: All, Every Year

ISCS-210 Python Programming (4 Credits)
Introduces computational thinking using Python, with an emphasis on problem solving through computer science. The course focuses on data manipulation and analysis allowing students to work on real problems using actual data sets and is designed to engage both majors and non-majors in improving critical thinking skills through practice.
Offered: All, Every Year