KEENE STATE COLLEGE
Computer Science Department Course Descriptions

ISCS140 Programming Foundations I
This course introduces students to pervasive 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. Offered: Fall, Spring, Summer

ISCS150 Website Design & Construction
This course introduces website construction as a pervasive methodology for problem solving and communication. It helps to prepare 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. Offered: Fall, Spring, Summer

INCS160 Microcomputer Systems
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. Offered: Fall, Spring

CS185 Programming Foundations II
This course extends the CS140 concepts to include more advanced programming concepts and principles such as: arrays of objects; inheritance, polymorphism, and amalgamation; exception handling; external file processing; recursion; basic GUI programming; creating user interfaces; introduction to data structures. Prerequisite: Grade C or higher in ISCS140. Offered: Fall, Spring

CS205 User Interface & Visual Programming
This course provides an introduction to various principles, theories, and approaches to user interface design and implementation. The content includes a study of the factors that affect user interface design, user acceptance factors, and mastery of at least one Rapid Application Development (RAD) tool. Prerequisite: Grade C or higher in CS185.
Offered: Spring.

CS215 System Administration (Unix/Midrange)
This course discuses 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: Grade of C or higher in CS185. Offered: Spring.

CS 225 C++ Programming
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-oriented programming, operator overloading, and file processing. It also includes a cursory treatment of fundamental data structures. Prerequisite: Grade C or higher in CS185. Offered: Fall.

CS230 Procedural Programming
This course enables students to learn procedural programming using a language such as COBOL, RPG, or C, thus making them equipped to work on legacy or embedded systems. Topics covered include basic input/output processing, control structures, sub-programs, recursion (where applicable), record manipulation, file processing, and other related issues. Prerequisite: Grade of C or higher in CS185. Offered: Occasionally as needed.

CS265 Computer Architecture
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. Prerequisites: Grade C or higher in ISCS140 and MATH135. Offered: Fall, Spring.

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CS280 Data Structures & Algorithms
This course guides students 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: Grade C or higher in CS185 and MATH135. Offered: Fall, Spring.

CS290 Special Topics *1-4 credits*
Elementary topics as determined by changes taking place in the discipline. Repeatable as topics change. Prerequisite: Minimum of 8 credits in CS. Offered: Fall, Spring, Summer.

CS293 Supervised Field Experience *1-2 credits*
Allows students to participate in field experience, combining theory with practice. Prerequisites: 16 credits in CS and permission of instructor. Graded Pass/Fail. Offered: Fall, Spring.

CS294 Cooperative Education *1-4 credits*
Introductory work-learning experience related to career interests for which compensation may be received. Positions arranged by students with sponsor-ship, approval, and evaluation by full-time faculty. Prerequisites: 8 credits in CS and permission of instructor. Graded Pass/Fail. Offered: Fall, Spring

CS310 System Programming: C and Assembler
Introduction to fundamentals of assembly and C language programming concepts and techniques with an in-depth understanding of x86 architecture computers by programming at the machine level. Proper use of assembler, registers, instructions and stack, and developing well-structured programs in assembly and C language are emphasized. Prerequisite: CS185. Offered: Fall.

CS320 Operating Systems Design
This course 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: CS280. Offered: Spring.

CS340 Internet Programming
This course harnesses the art and science of programming internet applications from a client-side perspective. Topics cover designing interactive web applications, using cascading style sheets, reading and writing database files, as well as usability and design considerations. Current web programming languages will be utilized. Prerequisites: CS185 and ISCS150. Offered: Spring.

ISCS350 Systems Analysis & Project Management
This course provides an introduction to fundamentals of systems analysis and design using project management. It discusses the role of the systems analyst with emphasis on oral and written communication with business users and the project team. Emphasizes structured design techniques. Requires detailed systems development case study using project management techniques. Prerequisite: 20 credits in CS and/or Management. Offered: Spring.

CS355 Computer Networks
This course introduces the concepts, principles, and rudiments of telecommunication systems, focusing on computer networks. It examines the various issues and alternate approaches in the design, implementation, and administration of computer networks. It covers the OSI layers, network protocols, TCP/IP, sub-netting, wireless technology, network security, and network expansion. Prerequisite: CS185. Offered: Spring.

CS360 Database Systems
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: Grade C or higher in CS 280. Offered: Fall.

CS375 Software Engineering
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: CS280. Offered: Fall.

CS395 Mobile Computing
This is an introductory course in creating applications for mobile devices including Android, iPhones, iPads, and the iPod Touch. It teaches how to conceive, design, construct, and deploy applications for these devices. It employs Xcode (Apple's native IDE), the Objective-C programming language, and the Cocoa Touch framework. Prerequisite: CS185. Offered: Fall

CS410 Advanced Software Development
This course is a study of advanced programming techniques of timely interest. Topics may include object-oriented techniques, special purpose languages, graphical programming, or advanced design techniques. Emphasizes continued development of problem-solving and programming skills. Prerequisites: CS185. Offered: Fall.

CS420 E-Commerce Development
This course covers e-business development, with emphasis on the server side. It includes: server side-web programming using Java Servlets; Java Server Pages; open source Java web server (Apache Tomcat); server customization to support their projects; utilization of Model-View-Controller architecture; security implementation; interface and connectivity with backend database(s). Prerequisites: CS185. Offered: Fall.

CS430 Principles of Programming Languages
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. Prerequisites: CS265 and CS280. Offered: Spring.

CS440 Software Engineering Project
This course provides the opportunity to apply the principles and skills acquired in earlier courses, and to investigate and design the blueprints for a software engineering project. Software will then be constructed in accordance with its design specifications. Emphasis will be placed on the various activities in the SDLC. Prerequisites: 32 credits in CS preferably including CS375. Offered: Spring.

CS455 Cryptography & Network Security
This course provides an introduction to fundamental concepts and techniques underlying the science and art of cryptography and network security including symmetric encryption, message digests, public key cryptography, authentication, security protocols on both application layer and network layer of the Internet, and network operational security techniques. Prerequisites: CS355. Offered: Fall.

CS460 Data Warehousing & Advanced SQL
This course introduces the principles, techniques and approaches to the design, construction, and management of data warehouses and data marts. It includes data warehousing topologies and methodologies, as well as advanced SQL features. Prerequisite: CS360. Offered: Spring.

CS490 Advanced Special Topics *1-4 credits*
Advanced topics as determined by changes taking place in the discipline. May be repeated as topics change Prerequisite: Minimum of 32 credits in CS. Offered: Occasionally as needed.

CS493 Advanced Supervised Field Experience *1-2 credits*
Allows students to participate in field experience, combining theory with practice. Prerequisites: 16 credits in CS and permission of instructor. Graded Pass/Fail. Offered: Fall, Spring, Summer.

CS494 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. Prerequisites: 16 credits in CS, and permission of instructor. Graded Pass/Fail. Offered: Fall, Spring, Summer.

CS495 Artificial Intelligence & Robotics
This course introduces the fundamental issues in artificial intelligence (AI). It 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 designing and programming a robot. Prerequisite: CS280. Offered: Spring.

CS496 Games Programming
This course guides the student through fundamental topics in the design and construction of computer games. It includes game architecture, game design issues, requisite data structures and algorithms, and programming issues. Programming will be done in Java and C++/C#. Prerequisites: CS280; MATH151 highly recommended. Offered: Spring.

CS498 Independent Study *1-4 credits*
Individual research into selected topics in computer studies under the direction of a faculty member. Prerequisites: 16 credits in CS and consent of the instructor who will supervise the independent study. May be repeated to a total of 4 credits. A maximum of 4 credits may be applied to the upper-level (300- and 400-level) CS elective requirement. Offered: Occasionally as needed.