Chairperson: William Spezeski, M.S.
(413) 662-5591, W.Spezesk@mcla.edu

COMPUTER SCIENCE AND INFORMATION SYSTEMS

PROGRAMS AVAILABLE

BACHELOR OF SCIENCE IN COMPUTER SCIENCE
COMPUTER SCIENCE MINOR
INFORMATION TECHNOLOGY MINOR
CONTRACT MINOR

COMPUTER SCIENCE MAJOR PROGRAM

The Department of Computer Science offers a four-year program leading to a Bachelor of Science in Computer Science focused on Information Technology. Students majoring in other departments may complete a minor in Computer Science or a minor in Information Technology.

Information Technology encompasses a broad range of computing and communications technologies that are used for information, entertainment, and commerce. With the growth of the Internet, the applications of these technologies now stretch from the factory floor to the office, boardroom, and home. These applications are based on distributed systems of networked computers and software developed using object-oriented techniques.

Career opportunities for graduates with these skills exist both in Internet companies and in more traditional companies that have a need for distributed systems of networked computers and software systems. Recent graduates have found employment with Internet startup companies, the insurance industry, communications companies, and government contractors. The major program is designed to provide students with a strong grounding in several areas. Students graduating with a degree in computer science will:

- be prepared to engage in the computer programming process, including problem solving techniques, program control constructs, and program implementation and testing;
- be familiar with the representation and manipulation of data within a computer program;
- be able to understand and use an object-oriented approach to design and implement computer programs;
- be able to understand and implement N-tiered distributed software systems;
- have developed a significant N-tiered distributed system as part of the program's capstone course sequence.

Computer Science Major Requirements

CSCI	153	Introduction to Programming I	3 cr
CSCI	253	Introduction to Programming II	3 cr
CSCI	312	Windows Programming	3 cr
CSCI	325	Advanced Programming I	3 cr
CSCI	326	Advanced Programming II	3 cr
CSCI	328	Object Oriented Design	3 cr
CSCI	335	Web Development I	3 cr
CSCI	336	Web Development II	3 cr
CSCI	342	Database Development I	3 cr
CSCI	343	Database Development II	3 cr
CSCI	351	Distributed Programming Concepts	3 cr
CSCI	402	Networked Systems Administration	3 cr
CSCI	452	N-tiered Software Development I	3 cr
CSCI	453	N-tiered Software Development II	3 cr
MATH	232	Introduction to Statistics	3 cr

One additional Discrete Mathematics course 3 cr

TOTAL COMPUTER SCIENCE MAJOR REQUIREMENTS 48

COMPUTER SCIENCE MINOR

Requirements

CSCI	153	Introduction to Programming I	3 cr
CSCI	253	Introduction to Programming II	3 cr
CSCI	312	Windows Programming	3 cr
CSCI	325	Advanced Programming I	3 cr
CSCI	326	Advanced Programming II	3 cr

One of the following 2 course sequences: 6 cr

CSCI	335	Web Development I
CSCI	336	Web Development II
or		
CSCI	342	Database Development I
CSCI	343	Database Development II
or		
CSCI	402	Networked Systems Administration
CSCI	447	Topics in Computing

TOTAL COMPUTER SCIENCE MINOR REQUIREMENTS 21

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INFORMATION TECHNOLOGY MINOR

Requirements

CSCI	153	Introduction to Programming I	3 cr
CSCI	253	Introduction to Programming II	3 cr
CSCI	312	Windows Programming	3 cr
CSCI	335	Web Development I	3 cr
CSCI	342	Database Development I	3 cr

One of the following: 3 cr

CSCI	336	Web Development II
CSCI	343	Database Development II

TOTAL INFORMATION TECHNOLOGY MINOR REQUIREMENTS 18

CONTRACT MINOR

With the approval of the Department, a student may put together a minor program from the departmental offerings supplemented by independent study courses and/or offerings from other departments. For example, minors in data communications, multi-media computing, or scientific computing might be created. Any such minor must consist of six three-credit courses with at least two at the 300 level or above.

COURSE LISTINGS

CSCI 151 Computers and Problem Solving 3 cr
Introduces various aspects of computing, including algorithm design, programming, and computer applications. Considers problem-solving techniques applicable to any discipline.
Prerequisite: None

CSCI 153 Introduction to Programming I 3 cr
Introduces the concepts of program development using a contemporary programming language. This course focuses on an introduction to simple variables and control structures, and on an introduction to object-oriented concepts.
Prerequisite: None

CSCI 162 Business Information Systems 3 cr
Provides the student with a basic understanding of information systems. With an increasing need to store, retrieve, analyze, and summarize data, information systems play a major role in decision-making, whether it be for a large corporation, a small business, or an educational institution. Covers the broad spectrum of information systems issues that are encountered in the world of work including technological & social considerations.
Prerequisite: CCCL 100

CSCI 247 Computing Topics 3 cr
Provides an understanding of a topic in computing which may be of interest to non-majors or may serve as a service course for other departments. The course introduces a topic not currently part of the department curriculum. Students are required to write about a topic related to the course material.
Prerequisite: CSCI 153 or permission of instructor

CSCI 252 Systems Development 3 cr
Introduces the systems-development life cycle, information gathering techniques, and techniques of systems analysis, design, and implementation. Computer-assisted software engineering (CASE) concepts will be introduced. Teams will analyze and design portions of computer-based systems. Oral and written presentations will be required.
Prerequisite: CSCI 153

CSCI 253 Introduction to Programming II 3 cr
Introduces the concepts of program development using a contemporary programming language. This course focuses on advanced concepts including structured variables, additional control structures, object creation, code reuse, and dynamic storage allocation.
Prerequisite: CSCI 153

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CSCI 275 Classroom Instructional Technology **3 cr**
Introduces the student to the concept of providing alternative classroom environments and teaching tools using recent technological advancements in computing. Provides hands-on projects and first-hand teaching and learning experiences. Students will conduct research in their specific field.
Prerequisite: CCCL 100

CSCI 312 Windows Programming **3 cr**
Introduces the development of programs designed to run in a windowing environment. Topics include event-driven programming, graphical user interface (GUI) design and implementation, and the use of a visual integrated development environment (IDE).
Prerequisite: CSCI 253

CSCI 318 Computer Organization and Assembly Language **3 cr**
Introduces students to the major hardware components of a computer system and to the organization of computers as a hierarchy of hardware and software. Considers the basic functional units of a computer system and then examines the following levels: digital logic, microprogramming, conventional machine language, operating system, and assembly languages.
Prerequisite: CSCI 325

CSCI 325 Advanced Programming I **3 cr**
Introduces the concepts of program development using an object-oriented programming language. This course focuses on additional programming concepts including data structures, file usage, object concepts, code reuse, template classes, and an introduction to the Standard Template Library.
Prerequisite: CSCI 253

CSCI 326 Advanced Programming II **3 cr**
Introduces the concepts of program development using an object-oriented programming language. This course focuses on additional programming concepts including virtual functions, abstract classes, polymorphism, run-time type identification, class hierarchies, and the Standard Template Library.
Prerequisite: CSCI 325

CSCI 328 Object Oriented Design **3 cr**
Introduces two related topics, the design of software, and the tools used in the design process. As the dominant, technology object oriented design will be addressed in this course. The Unified Modeling Language (UML) has evolved as the tool used in designing object oriented software systems, and will be covered in the course. Students are required to write about and present a topic related to the course material.
Prerequisite: CSCI 325 and concurrent enrollment in CSCI 326

CSCI 331 Operating Systems **3 cr**
Examines the role played by operating systems and offers insight into their design and implementation. Considers major components of an operating system, including process management, memory management, disk management, resource allocation, and security and protection. Covers both single and multi-processing systems.
Prerequisite: CSCI 326 and CSCI 318

CSCI 335 Web Development I **3 cr**
Introduces the development of World Wide Web applications. It emphasizes the client side tools and techniques used to develop web applications, and will include HTML, Dynamic HTML, client side scripting, Web page design issues, etc. The course will make use of interdisciplinary contributions from other departments on selected topics.
Prerequisite: CSCI 253

CSCI 336 Web Development II **3 cr**
Introduces the development of World Wide Web applications. It emphasizes the server side tools and techniques used to develop web applications, and will include CGI programming, active server pages (ASP and/or JSP), server side scripting, and middleware. Students are required to write about and present a topic related to the course material.
Prerequisite: CSCI 335

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CSCI 342 Database Development I **3 cr**
Introduces the design, management and programming of database systems. This course focuses on the design of a database and will provide hands-on experience with one or more DBMS products. It also examines the role of, and tasks performed by, a Database Administrator (DBA). The course will make use of interdisciplinary contributions from other departments on selected topics.
Prerequisite: CSCI 253

CSCI 343 Database Development II **3 cr**
Introduces the design, management and programming of database systems. The course focuses on the development of applications which access data stored in a database management system. It examines applications in both non-distributed and distributed environments. Students are required to write about and present a topic related to the course material.
Prerequisite: CSCI 342

CSCI 347 Topics in Information Systems **3 cr**
Provides in-depth study of an advanced topic in information systems. Introduces a topic not currently part of the departmental curriculum or examines a topic in more detail using current literature in the selected area. Each student will produce programs and/or a research paper relevant to the topic.
Prerequisite: CSCI 153 or CCCL100, and permission of the instructor

CSCI 351 Distributed Programming Concepts **3 cr**
Introduces the design, management and programming of distributed software systems, and examines the underlying technologies used to develop distributed applications (e.g. COM, DCOM, CORBA). Students are required to research and write about a topic related to the course material.
Prerequisite: CSCI 325

CSCI 402 Networked Systems Administration **3 cr**
Introduces the architecture and administration of various network hardware components and operating systems. This course will focus on the architecture and administration of a number of operating systems as they might be found in a network environment including MS Windows 9x/NT/2000 and Unix/Linux. Students are required to write about a topic related to the course material.
Prerequisite: CSCI 325

CSCI 421 Comparative Programming Languages **3 cr**
Compares programming languages in terms of models of computation, control and data structures, and implementation characteristics. Considers how these issues influence the choice of a language for a given application and prepares students to learn and evaluate new languages. Both traditional and recent languages will be considered as examples.
Prerequisite: CSCI 325

CSCI 441 Teaching Assistant in Computer Science **3 cr**
Assigns students to assist a member of the computer science faculty. Students will be involved in developing materials for class, giving workshops and help sessions, and evaluating computer science projects. A member of the faculty will coordinate, counsel, and evaluate students enrolled in the course.
Prerequisite: Department approval

CSCI 447 Topics in Computing **3 cr**
Provides an in-depth understanding of an advanced topic in computing. Starting with an examination of current literature, the course introduces a topic which is not currently part of the department curriculum or examines a topic that is part of the curriculum in more detail. Students are required to write about and present a topic related to the course material. The course will make use of interdisciplinary contributions from other departments on selected topics.
Prerequisite: CSCI 335, CSCI 342, and permission of instructor

CSCI 452 N-tiered Software Development I **3 cr**
Integrates the various skills and concepts introduced in the curriculum. This course focuses on the design of an n-tiered software system, and the initial implementation of that system. A team approach to software development is employed throughout. Students are required to research and write about a topic related to the course material. The course will make use of interdisciplinary contributions from other departments on selected topics.
Prerequisite: CSCI 335, CSCI 343, and CSCI 351

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CSCI 453 N-tiered Software Development II **3 cr**
Integrates the various skills and concepts introduced in the curriculum. The course focuses on completing the implementation and testing of an n-tiered software system. A team approach to software development is employed throughout. Students are required to write about and present a topic related to the course material. The course will make use of interdisciplinary contributions from other departments on selected topics.
Prerequisite: CSCI 336 and CSCI 452

CSCI 500 Independent Study **1-3 cr**
Designed for students who wish to undertake an in-depth examination of some topic of interest. The project will be carried out under the direction of a faculty sponsor.
Prerequisite: Junior/senior status; department approval

CSCI 540 Computer Science Internship **3-12 cr**
Open to juniors and seniors who would like to gain practical field experience in the computer industry. The intern will work under close supervision of both industry and department personnel.
Prerequisite: CSCI 326, junior/senior standing, department approval