

DEPARTMENT OF COMPUTER SCIENCE

Department Chair: Anne Foerst, Ph.D.

Faculty

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The computer science major prepares students for entry-level software engineering, networking, database application development, and web administration positions as well as for advanced study at the graduate level. Most graduates enter the workforce as computer professionals upon graduation; one or two per year elect to pursue study at the graduate level.

The department follows the Association for Computing Machinery's guidelines for undergraduate computer science education. The first two courses introduce object-oriented programming using Java. The third course focuses on computer organization and how programs are executed on hardware. The fourth course introduces some of the major trends in software development.

The department offers a variety of upper-division courses that permits students to explore different areas of the discipline and to find the ones in which they are most interested. Upper-division course offerings include courses in the areas of web development, database systems, computer networks, computer graphics, user interface design, artificial intelligence, robotics, and operating systems, among others. The department maintains two computer labs to support the curriculum. The Software Development Laboratory supports the first three courses in the major sequence and two upper-division courses.

In addition, our Cybersecurity program overlaps well and has its foundation in Computer Science – allowing many students to minor or double major in these two related fields. In addition, our Cybersecurity program overlaps well and has its foundation in Computer Science – allowing many students to minor or double major in these two related fields

Together, the computer science faculty has published numerous articles, textbooks, and received successful National Science Foundation grants.

With the addition of practicing professionals, the program faculty provides breadth and depth in the foundational, as well as emerging areas of Computer Science. Students often participate in research projects with faculty supervision. Students have co-authored papers with faculty members and have developed some of the courseware currently used in the undergraduate curriculum.

- Computer Science, BS (<https://catalog.sbu.edu/undergraduate/arts-sciences/computer-science/computer-science-bs/>)
- Computer Science, Minor (<https://catalog.sbu.edu/undergraduate/arts-sciences/computer-science/computer-science-minor/>)
- Cybersecurity, BS (<https://catalog.sbu.edu/undergraduate/arts-sciences/computer-science/cybersecurity-bs/>)

Computer Science (CS)

CS-COMP Comprehensive Exam (0 Credits)

Restrictions: RG.86+

CS-101 Beauty & Joy of Computer Science (3 Credits)

This course presents the history, social implications, great principles, and future of computing. It examines the computing applications that have changed the world and how computing empowers discovery and progress in other fields. The relevance of computing to the student and society will be emphasized. Students will learn the joy of programming a computer using a friendly, graphical language, and will complete a substantial team programming project related to their interests. The course consists of two lecture hours and one two-hour laboratory per week.

Corequisite(s): Take CSL-101

CS-128 INTRO GEOGRAPHIC INFO SYS CS (3 Credits)

An introduction to the theory and practice of GIS, with applications to environmental planning and resource management. Classes will address basic cartography, creation and interpretation of computerized maps, use of aerial photographs and remote sensing data, and the analysis and modeling of spatial data. Labs will familiarize students with the management and analysis of spatial data, using Microsoft Access and Excel and ArcView GIS software. A brief introduction to outdoor use of global positioning systems will occur at the end of the semester. Class and labs will emphasize group projects of practical and local application. Equivalent to ES 228.

CS-131 COMPUTER SCIENCE I (4 Credits)

This is the first course in the computer science major sequence. The course introduces the object-oriented approach to software design using the programming language Java. Topics covered are software design, implementation and testing, basic computer organization and source code translation. No previous programming experience is presupposed. The course consists of three lecture hours and one two-hour laboratory per week.

Corequisite(s): Take CSL-131

CS-132 COMPUTER SCIENCE II (4 Credits)

This is the second course in the computer science major sequence. The course utilizes the object-oriented design approach to building applications, which emphasizes the creation and utilization of reusable software tools. Students are introduced to data structures that are commonly encountered in building software applications and to the analysis of the efficiency of algorithms used to solve problems. The programming language Java is used to implement software designs. The course consists of three lecture hours and one two-hour laboratory per week.

Prerequisite(s): Take CS-131

Corequisite(s): Take CSL-132

CS-145 Windows Application Dev (3 Credits)

Introduction to event-driven, object-oriented programming using Microsoft Visual Basic or C#. Topics include effective user interface design, creating forms and reports, data types and data conversions, Active-X controls, execution control structures and file management.

CS-192 IND STUDY IN COMP SCIENCE (1-3 Credits)**CS-231 COMPUTER ORGANIZATION (4 Credits)**

A study of the organization of computer systems. Topics include the representation of information, conventional machine and assembly language, circuit design, and organization of the major components of a computer, e.g. the CPU, memory, I/O devices, etc. Students will become familiar with assembly language programming and will use simulators to learn about hardware components. The course includes three lecture hours and one two-hour laboratory per week.

Prerequisite(s): Take CS-132

Corequisite(s): Take CSL-231

CS-234 PROGRAMMING METHODOLOGIES (4 Credits)

A study of several modern approaches to practical software development at both a high and low level of abstraction. Students will become familiar with the Client-Server and Event-Driven models of software design, with elementary design patterns such as Adapter and Model-View-Controller that support these models and with techniques such as test-driven design and refactoring that aid in the implementation of these ideas. The course is primarily project-based and includes three lecture hours and one two-hour laboratory session each week.

Prerequisite(s): Take CS-132

Corequisite(s): Take CSL-234

CS-243 DATABASE MGMT SYSTEMS (4 Credits)

An introduction to database management systems, including database design and application development. Different database models are introduced, with emphasis on the relational model. The theoretical principles underlying the design of a database and the physical storage of data and its integrity are covered. The laboratory component is used to design and implement a real-world database application that illustrates theory.

Prerequisite(s): Take CS-132

Corequisite(s): Take CSL-243

CS-244 DATA-DRIVEN WEB APPL DEV (3 Credits)

Introduction to the design and implementation of a database-driven application using a tool such as Microsoft ASP.Net. Students will design and implement an e-commerce application based upon a SQL server database. The course presupposes familiarity with relational database design and application development. Topics include Visual Studio.Net tools for managing data sources, data controls for populating Web pages, data presentation tools, configuring, deploying and trouble-shooting an ASP.Net application. Students will build a data-driven Web site.

Prerequisite(s): Take CS-132

CS-254 COMPUTER NETWORKS (4 Credits)

A study of computer networks based on the OSI model of a layered network architecture. The TCP/IP protocol suite is used to illustrate network protocols. The course includes an overview of local area networks, routing algorithms, and network applications. The course consists of three lecture hours and one two-hour laboratory per week. The laboratory component provides experience in network programming using sockets.

Prerequisite(s): Take CS-132

Corequisite(s): Take CSL-254

CS-255 WEB SERVER MANAGEMENT (3 Credits)

Introduction to the design, deployment and maintenance of a web server. Students will learn how to set up, deploy, secure and manage a web server using both IIS and Apache. Students will act both as server managers and web server hackers. Topics include network protocols, server setup, server performance, server security, and server maintenance.

Prerequisite(s): Take CS-254

CS-256 COMPUTER GRAPHICS (4 Credits)

A survey of two- and three-dimensional computer graphics including graphics standards, graphics systems at both the hardware and software levels, and the implementation of graphics techniques for rendering an image. The course focuses on the architecture of computer graphics systems, and students will be expected to program within such systems as part of the course work. The course includes three lecture hours and one two-hour laboratory period per week.

Prerequisite(s): Take CS-132 AND MATH-208 or MATH-151

Corequisite(s): Take CSL-256

CS-257 USER INTERFACE DESIGN (4 Credits)

This course will expose the student to a wide variety of material related to the design of user interfaces. Command-time, batch, and event-driven models of user interaction will be discussed as well as presentation styles, models of communication and cognitive processes, and the social implications of user interface design. Students will study the theory of user interface design in class and will put that theory into practice through laboratory exercises and team projects.

Prerequisite(s): TAKE CS-132

Corequisite(s): Take CSL-257

CS-331 PRIN. OF PROGRAMMING LANGUAGES (3 Credits)

A study of the fundamental principles around which programming languages are designed. Topics include language specifications, syntax and semantics, data types, control statements, support for abstraction, and program organization. Students will be exposed to issues involving compilation, interpretation, lexical analysis, and parsing as well as to languages in each of the major paradigms. The course includes three lecture hours per week.

Prerequisite(s): Take CS-333

CS-332 THEORY OF COMPUTATION (3 Credits)

A mathematical treatment of formal language theory and how it relates to computer science. Topics include automata, grammars, Turing machines, computability, and computational complexity. The course includes three lecture hours per week.

Prerequisite(s): Take CS-333

CS-333 ALGORITHMS & DATA STRUCTURE (3 Credits)

A study of abstract data types including trees, hash tables, and graphs. The course will study each of these in the context of the analysis of algorithms and algorithm design techniques in general. Intractable and unsolvable problems and their implications will also be covered.

Prerequisite(s): Take CS-132 MATH-208

CS-341 ARTIFICIAL INTELLIGENCE (4 Credits)

A laboratory course that implements some of the artificial intelligence systems discussed in CS 141. The course is designed for computer science majors wishing to take CS 141 for credit towards the major. It must be taken at the same time as CS 141. The prerequisite is enforced strictly.

Prerequisite(s): Take CS-132

Corequisite(s): Take CSL-341

CS-342 ROBOTICS & COMPUTER VISION (3 Credits)

The course introduces the design of autonomous robots that are capable of carrying out tasks that involve intelligence. Higher-level intelligent behavior is built upon low-level algorithms that govern robot-environment interaction. Tasks examined are navigation, planning, object manipulation, and object recognition using 2-dimensional vision. Behavior control algorithms are developed for and tested on Khepera robots, miniature robots designed for this purpose.

Prerequisite(s): Take CS-333

CS-346 OPERATING SYSTEMS (4 Credits)

A study of modern multiprogrammed operating systems including system structure, concurrency, process scheduling and control, memory management, file systems, and system performance. The course consists of three lecture hours and on two-hour laboratory per week. The laboratory component provides experience in concurrent programming using Java threads and in system level programming using C in a UNIX environment.

Prerequisite(s): Take CS-231

CS-346H OPERATING SYSTEMS (HONORS) (4 Credits)

Prerequisite(s): Take CS-231

Restrictions: RG.HON

CS-354 INTRO INTERNET SYS. SECURITY (4 Credits)

Introduction to network security auditing. Students will learn how to perform the different phases of an audit, including discovery and penetration, as well as how to prevent hackers from controlling your network. This course introduces various tools to help students in the auditing process. Students will be exposed to international standards, along with time-tested methods for auditing a network efficiently, and they will be able to use specific, practical tools for counteracting network attacks. Finally, they will be able to analyze all findings and make informed recommendations for establishing the best security possible in a given scenario.

Prerequisite(s): Take CS-254

CS-380 SPECIAL TOPICS IN COMP.SCIENCE (3 Credits)

An intensive study of an aspect of computer science not fully treated in a regularly scheduled course.

Prerequisite(s): Take CS-132

CS-380A SP.TOPICS IN COMP.SCIENCE (3 Credits)

Prerequisite(s): Take CS-333

CS-380B SP TOP. CRYPTOLOGY (3 Credits)

An intensive study of an aspect of computer science not fully treated in a regularly scheduled course.

Corequisite(s): Take CS-132 & MATH-208

CS-380C SP TOP. CYBERSECURITY (3 Credits)

An intensive study of an aspect of computer science not fully treated in a regularly scheduled course.

Prerequisite(s): Take CS-132 & CSIA-101

CS-380D SP TOP. MACHINE LEARNING (3 Credits)

An intensive study of an aspect of computer science not fully treated in a regularly scheduled course.

Prerequisite(s): Take CS-132

CS-380E SP TOP.WIRELESS SENSOR NETWORKS (3 Credits)

An intensive study of an aspect of computer science not fully treated in a regularly scheduled course.

Prerequisite(s): Take CS-132

CS-442 AI AND ROBOTICS (3 Credits)

Faculty directed independent study in artificial intelligence or robotics.

CS-446 OP SYS (3 Credits)

Faculty directed independent study in operating systems.

Prerequisite(s): Take CS-346

CS-454 Networks (1-3 Credits)

Faculty directed independent study in computer networks.

CS-456 COMPUTER GRAPHICS PROJECTS (3 Credits)

Faculty directed independent study in computer graphics.

CS-457 ADVANCED USER INTERFACE PROJECTS (3 Credits)

Faculty directed independent study in user interface design.

Prerequisite(s): Take CS-257

CS-480A SP.TOP.FORMAL LANG. THEORY (3 Credits)**CS-490 SOFTWARE ENGINEERING (3 Credits)**

The course provides an overview of software requirements analysis, the software design process, verification and validation, software maintenance, and documentation. A major component of the course is a project that provides experience in the analysis and design of a software product using an object-oriented methodology.

Corequisite(s): Take CSL-490

Restrictions: RGM.129

CS-491 INTERNSHIP IN COMPUTER SCI. (1-3 Credits)

This program provides students with on-the-job training and experience which is not obtainable in classroom situations. The student is expected to secure a full-time position which involves significant work in an area of computer science. Each internship is individually arranged, subject to the approval of the computer science faculty.

Corequisite(s): Take CS-231

CS-492 IND.STUDY IN COMP.SCIENCE (1-3 Credits)

Independent study or project in some area of computer application or computer science under supervision of computer science faculty.

CS-492A Ind. Study in Comp Science (1-3 Credits)

Prerequisite(s): CS-232

CS-492C IND ST: RESEARCH (1-3 Credits)

Prerequisite(s): CS-232

CS-492D IND.STUDY SECURITY OPERATIONS CENTER (1-3 Credits)

Independent study or project in some area of computer application or computer science under supervision of computer science faculty.

CS-492E IND ST: RESEARCH & IMPLEMENTATION OF A SOC (3 Credits)

Independent study or project in some area of computer application or computer science under supervision of computer science faculty.

CS-492F DATABASE MANAGEMENT (3 Credits)

Independent study or project in some area of computer application or computer science under supervision of computer science faculty.

CS-492G IND ST: INTRO INTERNET SYS SECURITY (4 Credits)

Independent study or project in some area of computer application or computer science under supervision of computer science faculty.

CS-492J IND ST: NETWORK SECURITY (3 Credits)

Independent study or project in some area of computer application or computer science under supervision of computer science faculty.

CS-492K IND ST: HONEYPOTS & HONEYNETS (3 Credits)

Independent study or project in some area of computer application or computer science under supervision of computer science faculty.

CS-495 Technical Consulting in the Community (3 Credits)

CS 495 TECHNICAL CONSULTING IN THE COMMUNITY This course provides students with the opportunity to experience a technical consulting role with a local non-profit community organization. The student will apply professional and communication skills as he/she works with a community partner as a technical consultant. The student will spend at least three hours a week on-site at the organization and will write and present consulting reports based on his/her experience.

Prerequisite(s): Take CS-132

Restrictions: RGC.105

Computer Science Lab (CSL)

CSL-101 BEAUTY & JOY OF COMPUTING LAB (0 Credits)

Corequisite(s): Take CS-101(1508)

CSL-127 COMPUTER APPL TO SCI LAB (0 Credits)**CSL-128 GEOG. INFO. SYSTEMS LAB (0 Credits)**

Labs will familiarize students with the management and analysis of spatial data. Labs will familiarize students with the management and analysis of spatial data using ArcView GIS software. A brief introduction to outdoor use of global positioning systems will occur at the end of the semester. Class and labs will emphasize group projects of practical and local application.

CSL-131 COMPUTER SCIENCE I LAB (0 Credits)

Lab occurs once per week for two hours. Lab is taken with CS 131.

Corequisite(s): Take CS-131

CSL-132 COMPUTER SCIENCE II LAB (0 Credits)

One two-hour laboratory per week. Lab is taken with CS 132.

Corequisite(s): Take CS-132

CSL-231 COMPUTER ORGANIZATION LAB (0 Credits)

Corequisite(s): Take CS-231

CSL-234 PROGRAMMING METHODOLOGIES LAB (0 Credits)

Corequisite(s): CS-234

CSL-243 DATABASE MGMT SYSTEMS LAB (0 Credits)

Corequisite(s): Take CS-243

CSL-254 COMPUTER NETWORKS LAB (0 Credits)

One two-hour laboratory per week. The laboratory component provides experience in network programming using sockets. Lab is taken with CS 254.

Corequisite(s): Take CS-254

CSL-256 COMP. GRAPHICS LAB (0 Credits)

Prerequisite(s): Take CS-132

Corequisite(s): Take CS-256

CSL-257 USER INTERFACE DESIGN LAB (0 Credits)

Students will study the theory of user interface design in class and will put that theory into practice through laboratory exercises and team projects. Lab is taken with CS 257.

CSL-341 ARTIFICIAL INTELLIGENCE LAB (0 Credits)

Prerequisite(s): Take CS-132

Corequisite(s): Take CS-341

CSL-342 ROBOTICS/COMPUTER VISION LAB (0 Credits)

Corequisite(s): Take CS-342

CSL-346 OPERATING SYSTEMS LAB (0 Credits)**CSL-380 SPECIAL TOPICS LAB (0 Credits)**

Prerequisite(s): Take CS-333

CSL-490 SOFTWARE ENGINEERING LAB (0 Credits)

Corequisite(s): Take CS-490

Cybersecurity (CYB)

CYB-101 INTRODUCTION TO INFORMATION SECURITY (3 Credits)

This course is an elective to introduce students in any major to the Information Security field. Students will be introduced to main domains of Information Security and Information Assurance as represented in the COMPTIA Certification exam Security Plus. Upon successful completion of this course as documented through writing, objective testing, case studies, laboratory practice, and/or classroom discussion, the student will be able to: Define information security and explain why it is important Identify types of attackers, analyze vulnerabilities, attacks and suggest appropriate defenses. Describe various software security applications and vulnerability scanning tools. Explain the different types of logical and physical access control. Understand and explain authentication, authorization and accounting as it relates to computer security. Define and explain risk, risk management, and penetration testing.

CYB-180 SPECIAL TOPICS IN CYBERSECURITY (3 Credits)

An intensive study of an aspect of computer science not fully treated in a regularly scheduled course.

Prerequisite(s): CS-132

CYB-202 CYBERSECURITY ETHICS (3 Credits)

This course introduces students to ethical questions that come up in all areas of cybersecurity. We will discuss the ethical ramifications of several different types of hacks. We will explore ethical management in Cybersecurity and explore the concept of ethical hacking.

CYB-333 INFORMATION SECURITY (3 Credits)

This course is designed to introduce students to the development of information security policies and planning. Information systems, and the tools and techniques needed to establish, monitor and maintain information security will be examined.

Prerequisite(s): TAKE CS-131 CYB-101

CYB-354 INTRO TO NETWORK SECURITY (3 Credits)

Introduction to network security auditing. Students will learn how to perform the different phases of an audit, including discovery and penetration, as well as how to prevent hackers from controlling your network. This course introduces various tools to help students in the auditing process. Students will be exposed to international standards, along with time-tested methods for auditing a network efficiently, and they will be able to use specific, practical tools for counteracting network attacks. Finally, they will be able to analyze all findings and make informed recommendations for establishing the best security possible in a given scenario.

Prerequisite(s): TAKE CS-254

Corequisite(s): TAKE CYBL-354

CYB-355 COMPUTER CRIME (3 Credits)

Computer criminals are becoming ever more technically sophisticated, and it's an increasing challenge to keep up with their methods. This course will focus on computer crimes, what they are, how to prevent them, and how to detect, investigate prosecute them if they do occur and prevent them. Topics such as the impact of computer crimes, digital forensics, as well as computer crime laws will also be covered.

Prerequisite(s): TAKE CS-254

CYB-360 DIGITAL FORENSICS (3 Credits)

This course will provide an introduction to, and develop a foundation in, core concepts related to the field of digital forensics. Topics include an overview of computer crime, computer forensics law, forensic acquisition in lab and field environments, digital triage, mobile devices, identification of forensic artifacts in various operating systems, network forensics, report writing, ethical considerations in forensics, and courtroom testimony. The course will include lectures and hands on experiences using a variety of forensic tools.

Prerequisite(s): Take CYB-355

CYB-365 INVESTIGATIVE SOFTWARE TOOLS (3 Credits)

Intelligence led policing and intelligence based investigative strategies are coming to the forefront of law enforcement. Private industry is also becoming increasingly aware of the strategic intelligence model as it applies to corporate planning, competitive practices and maintaining corporate integrity. This course is designed to introduce students to several key software tools that are widely used and considered essential for intelligence research and criminal investigations. These software tools will include, but not be limited to, Analyst Notebook, iBase, and Idea. Students will be given a thorough understanding of how to apply these tools in the course of the intelligence process and/or during the course of a criminal investigation. The course will culminate with students preparing a project using all the software tools introduced during the course.

CYB-380 SPECIAL TOPICS IN CYBERSECURITY (1-3 Credits)

An intensive study of an aspect of computer science not fully treated in a regularly scheduled course.

Prerequisite(s): CS-132

CYB-380A SP TOP IN CYBERSECURITY: ADVANCED CYBERSECURITY (3 Credits)

An intensive study of an aspect of computer science not fully treated in a regularly scheduled course.

Prerequisite(s): CS-380C

CYB-380B SP TOP IN CYBERSECURITY: CYBERSECURITY INVESTIGATION (3 Credits)

An intensive study of an aspect of computer science not fully treated in a regularly scheduled course.

Prerequisite(s): CYB-101

CYB-380C SPECIAL TOPICS: LAW & POLICIES INVESTIGATION (3 Credits)

An intensive study of an aspect of computer science not fully treated in a regularly scheduled course.

Prerequisite(s): CYB-101

CYB-380D SP TOP: THREAT HUNTING FOR MS WINDOWS (3 Credits)

An intensive study of an aspect of computer science not fully treated in a regularly scheduled course.

Prerequisite(s): CYB-101

CYB-380E SP TOP: HOW ETHICAL HACKERS CAN COUNTER BLACK HAT HACKERS (1 Credit)

An intensive study of an aspect of computer science not fully treated in a regularly scheduled course.

Prerequisite(s): CYB-101

CYB-380F SP TOP: PSYCHOLOGY OF A HACKER (1 Credit)

An intensive study of an aspect of computer science not fully treated in a regularly scheduled course.

Prerequisite(s): CYB-101

CYB-410 INTRO TO CRYPTOGRAPHY (3 Credits)

In this course, the key terms, concepts and principles of cryptography are defined and explained. Application of cryptographic techniques to ensure confidentiality, integrity, authentication, access control, and non-repudiation issues will also be covered. Other topics will include the history of classical cryptographic and cryptanalytic techniques, modern symmetric and asymmetric algorithms, Federal Information Processing Standard (FIPS) algorithms, random and pseudo-random number generators and cryptographic hash functions.

Prerequisite(s): MATH-207 CS-254 CYB-333

CYB-411 INTRO TO PENETRATION TESTING (3 Credits)

To protect an organization's critical information and assets, cybersecurity professionals must regularly assess an information system's security controls through a process called penetration testing. This course will introduce students to the overall process and principles, as well as more deeply explore the identification of systems, services, and vulnerabilities. Students will be expected to stay up-to-date on emerging security flaws throughout the course, and understand the need for life-long learning in this domain.

Prerequisite(s): CYB-354 CYB-333

Corequisite(s): Take CYBL-411

CYB-491 INTERNSHIP IN CYBERSECURITY (1-3 Credits)

This course provides students with on-the-job training and experience which is not obtainable in classroom situations. The student is expected to secure a full-time position which involves significant work in an area of cybersecurity. Each internship is individually arranged, subject to the approval of the cybersecurity faculty.

CYB-492 IND STUDY IN CYBERSECURITY (1-3 Credits)

Independent study or project in some area of cybersecurity and its application under supervision of cybersecurity faculty.

Information Technology (IT)

IT-103 INTRO TO DOCUMENT CREATION (1 Credit)

Using word processing software, students will produce written documents, including letters, memos, multi-page reports, and newsletters. Note: IT 103, 104, and 105 may not be taken for credit after any other 3-credit computer course.

Corequisite(s): IT-104 OR IT-105 COMPLETED

IT-104 INTRO TO SPREADSHEETS (1 Credit)

Students will create spreadsheets to facilitate decision-making and illustrate numeric data using relative and absolute addresses, formulas, and system functions. Students will create tables to graphically present information in a spreadsheet and will create integrated documents using word processing and spreadsheet applications. Prerequisite: IT 103 or demonstration of proficiency. Note: IT 103, 104, and 105 may not be taken for credit after any other 3-credit computer course.

Corequisite(s): IT-103 OR IT-105 COMPLETED

IT-105 INTRO TO DATABASES (1 Credit)

Students will build and query a database and create forms and reports from database tables. Students will create integrated documents using word processing and database applications. Prerequisites: IT 103 and IT 104 or demonstration of proficiency. Note: IT 103, 104 and 105 may not be taken for credit after any other 3-credit computer course.

Corequisite(s): IT-103 AND IT-104

IT-120 INTRO TO COMPUTERS (3 Credits)

An introduction to the components and functions of a computer system, the Internet, and applications software. Students become familiar with the Internet and the campus e-mail program. Word processing, Web creation, spreadsheet, database, and presentation applications are used to provide practical experience using a personal computer. Note: IT 120 includes material from IT 103, 104, and 105. Students having completed one of those courses should not enroll in IT 120. Likewise, students who have completed a computer science course numbered 131 or higher should not enroll in IT 120.

Restrictions: RG.BUS

IT-123 USER CENTERED WEB SITE DESIGN (3 Credits)

An introduction to the creation of effective web pages and sites. Topics related to effective site creation include color, typography, layout and multimedia. Students will create web pages directly by producing html and css documents using a personal computer.

IT-192 IND STUDY IN INFORMATION TECH (1-3 Credits)

Independent study or project in some area of introductory computer applications or computer science faculty.

IT-220 DATA CRUNCHING IN BUSINESS (3 Credits)

An introduction to data manipulation in business, Microsoft EXCEL or an equivalent spreadsheet program, its application to business and accounting problems, and an introduction to data analysis and Pivot tables.

IT-280 SPECIAL TOPICS IN IT (1-3 Credits)

An intensive study of how information technology can be used in various fields. Students will be exposed to applications in both a theoretical and hands-on manner. Although there is no separate laboratory section, students will complete substantial amounts of their work using software applications.

IT-280A SP TOP. EXCEL IN BUSINESS (3 Credits)

An intensive study of how information technology can be used in various fields. Students will be exposed to applications in both a theoretical and hands-on manner. Although there is no separate laboratory section, students will complete substantial amounts of their work using software applications.

Restrictions: RG.BUS

IT-280B SPECIAL TOPICS IN IT: APP DEVELOPMENT (1-3 Credits)

An intensive study of how information technology can be used in various fields. Students will be exposed to applications in both a theoretical and hands-on manner. Although there is no separate laboratory section, students will complete substantial amounts of their work using software applications.