

Course Descriptions

COIN 209 - Introduction to Computer Systems (3 hours) An introduction to computers and to computer communication taught as a general course for all majors. Students will learn to use the software packages, Internet, electronic mail, and computer terminology necessary to function in today's information society. Software packages include, but are not limited to, an operating system, word processor, spreadsheet, web browser and database. (Laboratory fee required)

COIN 211 - Introduction to Computers for Business Applications (3 hours) Prerequisite: MATH 111 or higher, Corequisite: BUSI 211. An overview of using the computer to solve business-related problems, including word processing, presentations, databases and web design. This course will substitute for courses requiring Coin 209 as a prerequisite. The course does meet the LAC Computer Literacy requirement. (Laboratory fee required)

COIN 215 - Introduction to Information Technology (3 hours) A hands-on overview of emerging information technologies and the principles behind these developments. Topics include introductions to business applications, Internet technologies and program development. This course is not a substitute for courses requiring Coin 209 as a prerequisite. The course does meet the LAC Computer Literacy requirement. Lecture 2 hours, laboratory 2 hours. (Laboratory fee required)

COIN 217 - Visual Basic Programming (4 hours) Prerequisite: MATH 111 or higher. An introduction to fundamental concepts of computer programming and problem solving using the Visual BASIC language. Visual BASIC has become the tool of choice for developing user-friendly Windows applications in the business world. Fundamentals of programming, procedures, decisions, repetition, arrays, files, graphics, database management, and introduction to event-driven object-oriented programming. Lecture 3 hours, laboratory 2 hours. (Laboratory fee required)

COIN 235 - Introduction to Computer Science (4 hours) Prerequisites: COIN 215 or 217, and MATH 111 or higher. An introduction to the concepts of computer science using the C++ language. Problem solving techniques developing algorithms, program design and testing. Additional topics include history of computing and ethical issues in computing. Programming constructs include: control, repetition, functions, arrays, data types, and file handling. The COIN 215 or 217 prerequisite may be waived with prior programming experience and the professor's consent. Lecture 3 hours, laboratory 2 hours. (Laboratory fee required)

COIN 315 - Data Structure Analysis (4 hours) Prerequisites: COIN 325 grade of "C" or better, and MATH 231 grade of "C" or better. The effective application of data structures and abstract data types. Abstract data types studied include: lists, stacks, queues and trees. Implementation methods include: arrays, classes, pointers and recursion. Analysis methods include Big-Oh notation using induction and recurrence relations. Topics also include ethical issues in computer science. (C++ currently used). Lecture 3 hours, laboratory 2 hours. (Laboratory fee required)

COIN 322 – Multimedia (4 hours) Prerequisites: COIN 235 and 332. Learn the fundamental concepts and essential skills required for a successful career in multimedia. This course shows students how to use text, images, sound, and video to deliver compelling messages and content in meaningful ways. Students will learn to design, organize, and produce multimedia projects such as CD-ROMs, DVDs, and professional websites. Lecture 3 hours, laboratory 2 hours. (Laboratory fee required)

COIN 325 - Java I with Elementary Data Structures (4 hours) Prerequisite: COIN 235 or permission of the instructor. A course in object-oriented programming using Java. Course includes application and applet development, control structures, classes methods, arrays, inheritance, polymorphism, strings and characters, graphics, graphical user interface components, stacks, queues, trees, recursion and exception handling. Topics also include ethical issues in computer science. Lecture 3 hours, laboratory 2 hours (laboratory fee required).

COIN 326 - Java Programming II (4 hours) Prerequisite: COIN 325 or permission of the instructor. The course includes multithreading, files and streams, networking, multimedia (images, animation, audio, video), data structures, Java utilities package and bit manipulation, and Java collections. Lecture 3 hours, laboratory 2 hours. (Laboratory fee required)

COIN 330 - Computer Architecture (4 hours) Prerequisite: COIN 333 with a grade of "C" or better. This course explores the interdependencies among assembly language, computer organization and design with a focus on the concepts that are the basis for current computer technology. Stored-program concept, computer arithmetic, datapath and control, microprogramming, logic design, truth tables, logic gates, programmable logic arrays, control, pipelining, the memory hierarchy, and caches. Lecture 3 hours, laboratory 2 hours. (Laboratory fee required)

COIN 332 - Applied Networking(4 hours) Prerequisite: COIN 217 and 235. An introduction to the fundamentals of networking using the OSI model as a framework. Basic hardware components: routers, hubs, switches, Ethernet, fiber optics, wireless. Protocols: application layer (HTTP), transport layer (TCP, UDP), network layer (IP), link layer (Ethernet). Introduction to application programming in a networking environment, including protocols and languages such as XHTML, DHTML, Perl, Python, Flash, ASP, and JavaScript. Additional topics include historical perspectives on network evolution and ethical issues. Lecture 3 hours, laboratory 2 hours. (Laboratory fee required)

COIN 333 - Applied Systems (4 hours) Corequisite: COIN 315. The application of program development, systems programming, shell programming, graphical user-Interfaces, and system management to a computer system (Linux, AS400, or other system). An introduction to assembly language programming. Lecture 3 hours, laboratory 2 hours. (Laboratory fee required)

COIN 334 - User-Interface Programming (4 hours) Prerequisites: COIN 235 and 332. The fundamentals of user-interface design and programming. Using principles of human-computer interaction, the course teaches how to program within a windowing

environment: object-oriented design techniques, forms, event-driven programming, multithreading, and network programming. Programming language and platform may vary. Lecture 3 hours, laboratory 2 hours. (Laboratory fee required)

COIN 409 - Fundamentals of Artificial Intelligence (4 hours) Prerequisite COIN 315. This course introduces the fundamentals of artificial intelligence such as problem solving, knowledge representation, natural language processing, state-space search, and perception. Students will also learn the fundamentals of the LISP programming language, rule-based representation, and searching methods. While highly theoretical in nature, the student will participate in programming exercises in order to become proficient in the LISP programming language and enhance his/her understanding of the material. Lecture 3 hours, laboratory 2 hours. (Laboratory fee required)

COIN 415 – Algorithms (4 hours) Prerequisites: COIN 333 (with grade of “C” or better). An introduction to the theory of computation including Nondeterministic Polynomial-time Problem, Computational Intractability, Turing Machines, Algorithm analysis, advanced algorithms and limits of computation. (Laboratory fee required)

COIN 419 - Database Management (4 hours) Prerequisites: Students must have completed 12 hours in BUSI and/or COIN. This course examines how organizations use technology to manage data as an organizational resource. Students will learn to analyze an organization’s purpose and develop an information system that will meet the data needs of the organization. Topics include methods for accessing data requirements, developing a conceptual data design, translating that design into an operational information system, and administering and managing organizational data. Through student projects, students will apply concepts learned to an actual organization. Lecture 3 hours, laboratory 2 hours. (Laboratory fee required)

COIN 431 - Advanced Operating Systems (4 hours) Prerequisite: COIN 315. Corequisite: COIN 333. Operating systems and file services, CPU scheduling, memory management and virtual memory, deadlocks and protection, concurrent processes and programming, and distributed systems. Lecture 3 hours, Laboratory 2 hours. (Laboratory fee required)

COIN 432 - Mobile and Wireless Networks (4 hours) Prerequisite: COIN 332. Architecture and applications of advanced mobile and wireless networks. Top-down network layer concepts, network access technologies, mobility management, and quality of services in wireless internet networks. Investigation into mobile middleware that bridges wireless networks and the Internet. Lecture 3 hours, laboratory 2 hours. (Laboratory fee required)

COIN 433 - Network Security (4 hours) Prerequisites: COIN 333 and 435. Network security foundations including sources of weakness in networks, methods for security in network communication, methods for protecting systems from network attacks, methods for detecting intrusions and appropriate responses to intrusions. Lecture 3 hours, laboratory 2 hours. (Laboratory fee required)

COIN 435 - Advanced Networking (4 hours) Prerequisites: COIN 325 and 332. An advanced course in networking covering; transmission media, layered system organization, routing algorithms, protocol theory, quality of service, security, Voice over IP. Lecture 3 hours, laboratory 2 hours. (Laboratory fee required)

COIN 450 - Graphics(4 hours) Prerequisites: COIN 315 and MATH 130. Topics include modeling systems, Geometric objects, transformation, 3D Viewing, Vector tools for Graphics, and Rendering tools using OpenGL with C++. Lecture 3 hours, laboratory 2 hours. (Laboratory fee required)

COIN 495 - Systems Analysis and Software Design (3 hours) Prerequisite: COIN 325 or 419. Examines the overall business firm as a balanced decision-making supersystem of integrated subordinate subsystems. The concepts of information system planning, design and utilization are approached through recognized system development procedures. Case studies and simulation models are used to demonstrate the importance of effective business information processing systems. In addition, the course requires a team-based semester project involving an actual organization. (Laboratory fee required)

COIN 496 - Senior Portfolio Review (0 hours) Prerequisite: Permission of instructor. The purpose of Coin 496 Senior Portfolio Review is to determine if the student has the appropriate course depth in introductory COIN coursework to begin his/her senior project series. The BS or BA student shall create a portfolio that must include: (1) at least three papers on ethical, legal, or social issues in computing, (2) at least four programs (one from each of COIN 315, COIN 325, COIN 332, and COIN 333), and (3) at least two presentations. In the case where courses were transferred and programs are no longer available, the faculty may ask for material from other classes. For our BT candidates, the Senior Portfolio Review determines whether the student has had adequate coursework in order to qualify for graduation. The BT student shall create a portfolio with (1) at least one paper on ethical, legal, or social issues in computing, and (2) at least two programs from COIN courses. The BT advisor for the student shall review the portfolio to determine that it is adequate depth for consideration for graduation. Course grade is Pass/Fail. **This course cannot be challenged.**

COIN 497 - Senior Project Design (1 hours) Prerequisites: COIN 495 and 496. The first of a project-based capstone series. Student will complete the design of a significant project which is usually planned during the prerequisite course. Student will be guided by an assigned instructor. The project ultimately will be defended orally during the final course in the capstone series. (Laboratory fee required) **This course cannot be challenged.**

COIN 498 - Senior Project Construction (1 hours) Prerequisite. COIN 497, or permission of the instructor. The second of a project-based capstone series. Student will complete construction of a significant project which was designed in the first of the capstone series. Student will be guided by an assigned instructor. The project ultimately will be defended orally during the final course in the capstone series. (Laboratory fee required) **This course cannot be challenged.**

COIN 499 - Senior Project Implementation/Defense (1 hours) Prerequisite: COIN 498, or permission of the instructor. The last in a project-based capstone series. Must be taken as the student’s final Coin requirement in the major. Student will implement the project under the guidance of an assigned instructor, then defend it before a panel of student peers, faculty and others. Requires assimilation

of the skills, tools, techniques, and theory learned in the total university experience. Defense includes an examination of the students' entire computer science knowledge and a presentation of their final portfolio. Failure to demonstrate a comprehensive knowledge of computer science or failure to demonstrate professional programming and analysis skills will cause the student to fail this capstone course. (Laboratory fee required) **This course cannot be challenged.**

MATH 099 - Beginning Algebra (4 hours) Prerequisites: Admission to CSU through the Bridge Program (SAT Math score below 440 or ACT Math score below 19) or appropriate score on the MATH Placement Exam. A course in basic algebra skills for students who are deemed at risk in the area of Mathematics. Topics include properties of the real numbers; fundamental operations with linear expressions, solutions of linear equations and inequalities; operations on polynomial expressions, including polynomial division; graphing linear equations on the Cartesian Coordinate system; functions; factoring of quadratic and other polynomial expressions; solving quadratic equations; operations on rational and radical expressions; solving rational and radical equations. Course is required of students accepted into the Bridge program. Class meets 4 lecture hours and a (minimum of one) 30-minute individual tutoring appointment every week. Students must pass the course with a 'C' or better before matriculating from the Bridge Program and/or to any other Mathematics course. This course may not be attempted more than twice. Students receive institutional credit only.

MATH 111 - College Algebra (3 hours) Prerequisite: MATH 099 or departmental permission. A course designed for Science and Education majors to prepare them for further study in mathematics. Topics include linear, quadratic, polynomial, rational, exponential and logarithmic functions and their graphs, equations and inequalities, systems of equations. Emphasis on solving problems involving natural science and engineering applications. A graphing calculator is required.

MATH 130 - Precalculus (4 hours) Prerequisite: MATH 111 (grade of "C" or better) or departmental permission. This course provides the student with a thorough preparation for the Calculus sequence. Topics include study of exponential, logarithmic and trigonometric functions, inverse functions, trigonometry and trigonometric identities, conic sections, and polar coordinates. Additional topics, including the binomial theorem, mathematical induction, and sequences and series may be covered as time permits.

MATH 209 - Calculus for Business (3 hours) Prerequisite: Math 111 (grade of "C" or better) or appropriate math placement. This one semester course is designed to introduce the basic concepts of calculus to students majoring in Business and Economics. The course centers around differential calculus of one and several variables and integral calculus of one variable. A graphing calculator is required.

MATH 213 - Probability and Statistics (3 hours) Prerequisite: MATH 130 (grade of "C" or better). Topics include representation of data, basic probability, random variables, estimation and hypothesis testing, correlation and regression.

MATH 222 - Calculus II (4 hours) Prerequisite: MATH 221 (grade of "C" or better). Applications of the definite integral; techniques of integration, improper integrals, indeterminate forms, and infinite series; parametric and polar equations.

MATH 321 - Calculus III (4 hours) Prerequisite: MATH 222 (grade of "C" or better). Analytic geometry in three dimensions, vectors, vector-valued functions, differentiation and integration of vector-valued functions, partial differentiation, iterated integrals, double and triple integrals and their applications, vector fields, line and surface integrals, Green's Theorem, Gauss's Theorem, and Stokes' Theorem.

MATH 326 - Linear Algebra (4 hours) Prerequisite: MATH 222 (grade of "C" or better). Mathematics 325 and 326 need not be taken in sequence. Introduction to the theory and application of linear algebra. Matrices, systems of linear equations, determinants, vector spaces, linear transformations, eigenvectors, and eigenvalues. Students will be expected to utilize a computer algebra system to complete laboratory assignments. Lecture: 3 hours. Laboratory: 2 hours. (Laboratory fee required.)

MATH 330 - Discrete Mathematics (3 hours) Prerequisites: MATH 222 (grade of "C" or better) or both MATH 221 and MATH 231 (grade of "C" or better) Elementary propositional logic, set theory, mathematical induction, functions, and relations; methods of direct and indirect proof, proof by contradiction, cardinality of sets. Additional topics may include introduction to graph theory, number theory or combinatorics.

MATH 346 - Probability Theory (3 hours) Prerequisite: MATH 321 (grade of "C" or better). Axioms and laws of probability, discrete and continuous distributions; joint, marginal and conditional distribution functions; special probability distributions, expectation and moment generating functions, laws of large numbers, and functions of random variables.

MATH 347 - Statistics (3 hours) Prerequisite: MATH 346 (grade of "C" or better). Sampling distributions, order statistics, point and interval estimation: central limit theorem; logic, construction and application of hypothesis testing; linear statistical models and their applications, designed experiments and analysis of categorical data.