

**COMPUTER AND INFORMATION SCIENCES (COIN) –**  
**College of Science and Mathematics**  
**Department of Computer and Information Sciences**

- 209. INTRODUCTION TO COMPUTER SYSTEMS (3).** 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)
- 211. INTRODUCTION TO COMPUTERS FOR BUSINESS APPLICATIONS (3).** Prerequisite: Mathematics 109 or higher, Corequisite: Business 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)
- 215. INTRODUCTION TO INFORMATION TECHNOLOGY (3).** 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)
- 217. VISUAL BASIC PROGRAMMING (4).** Prerequisite: Math 109 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 3 hours. (Laboratory fee required)
- 235. INTRODUCTION TO COMPUTER SCIENCE (4).** Prerequisites: COIN 215 or 217, and Mathematics 109 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 3 hours. (Laboratory fee required)
- 252. MIDRANGE COMPUTING PRINCIPLES AND CONCEPTS (4).** Prerequisites: MATH 109 or higher, and COIN 217. An introduction to the principles and operation of midrange computers using the iSeries AS/400 system. Topics include: subsystems, libraries, files, security, device configuration, command languages, COBOL, interactive SQL and embedded SQL. Lecture 3 hours, laboratory 3 hours. (Laboratory Fee Required)

- 315. DATA STRUCTURE ANALYSIS (4).** Prerequisites: COIN 325 with a C or better, and Mathematics 231 with a 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 3 hours. (Laboratory fee required)
- 325. JAVA I WITH ELEMENTARY DATA STRUCTURES (4).** 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 3 hours (laboratory fee required).
- 326. JAVA PROGRAMMING II (4).** 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 3 hours. (Laboratory fee required)
- 330. COMPUTER ARCHITECTURE (4).** 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 3 hours. (Laboratory fee required)
- 332. APPLIED NETWORKING (4).** 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 3 hours. (Laboratory fee required)
- 333. APPLIED SYSTEMS (4).** 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 3 hours. (Laboratory fee required)
- 334. USER-INTERFACE PROGRAMMING (4).** 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 3 hours. (Laboratory fee required)

- 415. ALGORITHMS (4).** 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)
- 417. COMPILER CONSTRUCTION (4).** Prerequisites: COIN 315 and 333 (both with a C or better). Program language structures, translation, loading, execution, and storage allocation; compilation of simple expressions and statements; organization of compiler including compile-time and run-time symbol tables, lexical scan, syntax scan, object code generation, error diagnostics, object code optimization techniques, and overall design; use of compiler writing languages and bootstrapping. Lecture 3 hours, laboratory 3 hours. (Laboratory fee required)
- 419. DATABASE MANAGEMENT (4).** 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 3 hours. (Laboratory fee required)
- 431. ADVANCED OPERATING SYSTEMS (4).** Prerequisite: COIN 315 and 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 3 hours. (Laboratory fee required)
- 432. MOBILE AND WIRELESS NETWORKS (4).** Prerequisites: COIN 325 and 435. 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 3 hours. (Laboratory fee required)
- 433. NETWORK SECURITY (4).** 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 3 hours. (Laboratory fee required)
- 435. ADVANCED NETWORKING (4).** 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 3 hours. (Laboratory fee required)

- 450. GRAPHICS USING OPENGL (4).** Prerequisites: COIN 315 and Mathematics 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 3 hours. (Laboratory fee required)
- 495. SYSTEMS ANALYSIS AND SOFTWARE DESIGN (3).** 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)
- 496. SENIOR PROJECT PORTFOLIO REVIEW (0).** Corequisite: COIN 495. Prior to entry into the senior project series, students must submit a portfolio for review (COIN 496). By the last day of classes, students must have at least three papers on ethical, legal or social issues in computing, at least four programs (one from each of COIN 315, COIN 325, COIN 332, COIN 334), and 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. Course grade is Pass/Fail. **This course cannot be challenged.**
- 497. SENIOR PROJECT DESIGN (1).** 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. **This course cannot be challenged.** (Laboratory fee required)
- 498. SENIOR PROJECT CONSTRUCTION (1).** 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. **This course cannot be challenged.** (Laboratory fee required)
- 499. SENIOR PROJECT IMPLEMENTATION/DEFENSE (1).** 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. **This course cannot be challenged.**  
(Laboratory fee required)