

Course Descriptions – Computer Science

CSC 100 Introduction to Computer Science (3) This course provides students with a general orientation to computer science, including a basic understanding of the components of a computer and how they function. It will introduce the student to the process of program development and provide the student with an overview of computer operations to include the operating system, basic networking and telecommunications. Other topics covered include number systems, file management, data organization, and an introduction to the C++ programming environment.

CSC 144, Computer Science I (4) Introduction to problem solving using the C++ programming language. Topics include algorithm and program development, syntax of C++, input/output statements, assignment operations, program control structures, functions, and single dimensional array processing. Additional topics may be added if time permits. Prerequisite: Credit or concurrent enrollment in CSC 100 .

CSC 184, Computer Science II (4) This course is a continuation of CSC 144. Topics include multidimensional array processing, character data manipulation, elementary searching and sorting techniques, structures, classes to include overloading, pointers and data abstraction. Prerequisite: CSC 144 with a grade of C or better.

CSC 221 Language Workshop (3-4) A workshop in one of several programming languages available. Topics include the structure of programs, control structures, functions, data types, string operations, and special topics appropriate to the language being studied. Students write several programs in the selected language during the course of the workshop. This course may be repeated for credit. Languages include Scheme, Perl, and FORTRAN. Prerequisite: CSC 184 .

CSC 255 Assembly Language Programming (3) This course is an investigation of the logical basis of a particular computer from the programmer's viewpoint. Topics covered include machine representation of numbers and characters, instruction formats, machine operations and organization, and addressing techniques. Students will write programs using the Assembly Language. Prerequisite: CSC 144 with a grade of C or better.

CSC 305 Principles of Database Systems (3) Designed to give an overview of the major themes of database theory, design and manipulation. Concepts and techniques of structuring data on secondary storage devices, file processing, and database organization will be introduced. The network and hierarchical models will be discussed, but attention will be paid to application of database systems, conceptual modeling, the relational data model, and relational algebra. Prerequisite: CSC 184 with a grade of C or better.

CSC 320 UNIX Workshop (3) A workshop in the fundamentals of the UNIX/LINUX operating systems. Topics covered will include using shells, text editing, file system structures, file system security, file-system processing-processes, electronic mail, networking, shell programming, software development tools, system administration, windows managers, and desktop managers. Prerequisite: C or better in CSC 184

CSC 340 COBOL Programming (3) This course addresses programming in a business-oriented environment. It focuses on developing applications for business use. It is geared toward an experienced programmer who needs to learn COBOL. The student will learn how to work with sequential files, control breaks and data validation. Prerequisite: CSC 184 with a grade of C or better.

CSC 360 Data Structures and Algorithms (3) This course continues the study of data structures and algorithms begun in CSC 184. Topics covered include: stacks, queues, linked lists, and trees. Also included are recursion, graphs, hashing techniques. Various representations of data structures will be reviewed. Prerequisites: CSC 184 with a grade of C or better.

CSC 380 Telecommunications and Computer Networking (3) Theoretical foundation necessary for understanding telecommunication and networking is the main focus of this course. You will learn to define the components required for successful communications, identify various sending and receiving devices, understand the various topologies and communications technologies and differentiate between a local area network and wide area network. Prerequisite: CSC 184 with a grade of C or better.

CSC 402, Visual Basic Programming (4) This course is designed to give students advanced knowledge of a programming language using the latest version of Visual Basic. Topics include the structure of the language, control structures, functions, data types, Object Oriented Programs, Data Files, Sub Procedures, Accessing databases, and creation of multiple forms, radio buttons, check boxes, drop down list, scroll bars, list boxes, and combo boxes. Prerequisite: C or better in CSC 184.

CSC 403 Computer Architecture (3) The course deals with the hardware software interface. The course includes topics in computer performance, computer organization and structure, machine language, computer arithmetic, assembly language, addressing techniques, program segmentation and linkage, the assembly and linking process, the fundamentals of digital logic, sequential processor design and performance, and the memory hierarchy. Prerequisite: C or better in both CSC 255.

CSC 405 Computer Graphics (3) A first course in computer graphics. Topics include: graphics systems and packages, output primitives and their attributes, two-dimensional geometric transformations and viewing, structures and hierarchical modeling, graphical user interfaces, and interactive input methods. Additional topics may include three dimensional object representations, three dimensional geometric and modeling transformations, visible-surface detection methods, illumination models and surface rendering methods, color models and applications, and computer animation. Prerequisite: CSC 184 with a grade of C or better.

CSC 406 Operating Systems S (4) This course covers the theory and practice of modern operating system design. Topics include processor scheduling and management, memory management techniques, file systems, virtual memory, I/O and secondary storage scheduling, deadlocks, concurrency and security issues. Prerequisite: CSC 255 with a grade of C or better.

CSC 408 Organization of Programming Languages (3) This course is designed to give the student a deep, hands-on understanding of the essential concepts of programming languages. Techniques developed lead to the creation of scanners, parsers and compilers. Prerequisites: CSC 255 with a grade of C or better.

CSC 409 Topics in Computer Science (3) This course explores selected emerging topics in the field of computer science. Topics may include: Software Engineering, Human Factors in Software Design, Computers and Society, Complexity Theory, Concurrent/Parallel Programming, Artificial Intelligence, Expert Systems, Computer Simulations and Operation Research. The course may be repeated once for credit. Prerequisite: CSC 360 plus 6 credit hours of CSC courses numbered 300 or higher.

CSC 410, JAVA Programming (4) This course is designed to give students advanced knowledge of a programming language using Java. Emphasis will be on the fundamental syntax and semantics of Java for applications and Web applets. Additional topics include: variables, data types and expressions, control structures (branching and looping), programmer-defined classes, arrays, graphical user interfaces, and accessing databases as a back end. Prerequisite: C or better in CSC 184.

CSC 425 Advanced Database Design (3) This course is the continuation of CSC 305. Topics include: database application design, multi-user databases, and enterprise database processing. This course is project oriented and will include experience in functioning in a project group, meeting users, writing requirements document, and implementing the requirements document into a functional database. Prerequisites: CSC 305 with a grade of C or better.

CSC 447 Project Management and Practice (3) This course prepares the student for planning, scheduling and controlling the activities during the System Development Life Cycle. The focus of this course is the specific role of the Project Manager which will include time management, cost estimation, order of activities and the determination of the responsible parties involved in the process. Prerequisite: CSC 305 with a grade of C or better.

CSC 451, 452, 453 Cooperative Education in Computer Science (3) These courses give a student the opportunity to earn academic credit in a planned learning process that integrates academic training with supervised work experience. This course may be taken on a pass/fail basis. Prerequisite: Acceptance into the Lindenwood Computer Science Cooperative Education Program.

Program Course Requirements - Mathematics

MTH 131 Quantitative Methods for Business (3) (GE) This course is designed to introduce business students to the use of quantitative methods. Topics covered will include solving and graphing linear functions and inequalities; writing mathematical models; solving systems of equations; linear regression; and an introduction to linear programming. Tools used will include calculators and computers. A graphic calculator is required. Prerequisite: C or better in MTH 101 or MTH 110.

MTH 141 Basic Statistics (3) An introduction to the theory and applications of statistics, including probability, descriptive statistics, random variables, expected values, distribution functions, and hypothesis testing. Offered every semester.

MTH 151 College Algebra (3) A first course in college algebra including the following topics: polynomial equations and inequalities, mathematical modeling and problem solving, rational functions, other functions and relations. Students who enjoy math, students who need MTH 151 for their major, students who are going on and taking higher level math courses, and/or students who are majoring in math but need to strengthen their algebra skills are the only students for whom this course is recommended. Prerequisite: Two years of high school algebra.

MTH 152 Precalculus: Elementary Functions (3) A preparation for calculus covering polynomial and rational functions, exponential and logarithmic functions, trigonometric functions, applications and systems of linear equations. A graphing calculator is required. Prerequisite: Two years of high school algebra or MTH 151.

MTH 271, Calculus I (5) A first study of real functions and some of their applications. Topics include limits, continuity, differentiation and integration. A graphing calculator is required. Prerequisite: High school algebra and trigonometry OR C or better in MTH 152.

MTH 272 Calculus II (5) A continuation of the study of real functions of one variable. Topics include integration, applications of integrations, methods of integration, infinite series, and vectors. A graphing calculator is required. Prerequisite: C or better in MTH 271 .

MTH 290 Introduction to Advanced Mathematics (3) A transition course from elementary to advanced mathematics. Topics covered include logic, proof techniques, set theory, discrete math, the natural numbers, induction, functions, relations and the foundations of number systems. Prerequisite: MTH 272 or taken concurrently by the mathematically mature.

MTH 303 Calculus III (5) The study of real functions of more than one variable. Topics include partial derivatives, gradient, potential functions, line integral, multiple integration, and Taylor's formula. A graphing calculator is required. Prerequisite: MTH 272.

MTH 315, 316 Linear Algebra I, II (3) (3) A study of the finite dimensional vector spaces, linear mappings between them and applications to differential equations and geometry. Topics include solution of linear equations, matrices, determinants, bilinear mappings and forms, diagonalisation. Prerequisite: MTH 290. MTH 315 is offered spring semester.

MTH 321 Discrete Mathematics (3) This course will briefly review logic, sets, functions and relations, and methods of proof before using these concepts to study discrete (rather than continuous) mathematics. Topics covered may include combinatorics, graph theory, algorithms and their analysis, Boolean algebra, finite state machines, finite difference equations and applications of these topics. Prerequisite: MTH 290..

Program Course Requirements - Physics

PHY 251, Introductory Physics I (4) An algebra-based treatment of mechanics including kinematics, vectors, Newton's laws, and conservation of energy and linear momentum. Other topics include rotational motion, moments of inertia, rotational energy and angular momentum. This course also treats solids, fluids, waves, sound, and thermodynamics. Lab work is included. This course is available for honors credit. Lab fee required. Prerequisite: high school algebra and trigonometry.

PHY 252, Introductory Physics II (4) An algebra-based treatment of thermodynamics, electricity, and magnetism, including electric fields, Gauss's law, voltage capacitors, inductors, Kirchhoff's laws, AC and DC circuits, and geometric and physical optics. Lab work is included. This course is available for hours credit. Prerequisite: PHY 251. Lab fee required.

PHY 301, General Physics I (4) A calculus-based treatment of mechanics for scientists and engineers, including kinematics, vectors, Newton's laws, and conservation laws for energy, linear momentum, and angular momentum. Other topics include equilibrium and elasticity, gravitation, fluids, simple harmonic oscillations, waves and thermodynamics. Lab work is included. This course is available for honors credit. Lab fee required. Prerequisite: MTH 271.

PHY 302, General Physics II (4) A calculus-based treatment of electromagnetism for scientists and engineers, including electric fields, Gauss's law, scalar potential fields, Maxwell's equations, electromagnetic oscillations, electromagnetic waves, and optics. Lab work is included. This course is available for honors credit. Prerequisite: PHY 301. Lab fee required.

Program Course Requirements - Others

BA 200 Principles of Financial Accounting (3) A study of the accounting information framework used by organizations to collect, maintain, and report financial information. Special emphasis is given to transaction analysis and the resulting effect on the accounting equation. Considerable time is spent on financial statement analysis and use by outside users. Prerequisite: Sophomore status recommended.

BA 201 Principles of Managerial Accounting (3) The development, analysis, interpretation, and communication of financial information designed to assist managers in achieving the goals of an organization. Topics will include discussions about different cost accumulation systems, cost management systems, activity-based costing and management, and planning and control. Prerequisite: BA 200 .

BA 210 Survey of Economics (3) This course is designed to introduce basic economic concepts, relationships and institutions. The course provides a foundation for applying economics to individual decision making and for critically analyzing aggregate economic behavior and policy. NOTE: This course satisfies one social science general education requirement. This course will not fulfill a core or elective requirement for business administration students.

BA 330 Principles of Management (3) Development of the understanding of organizations and of the decision-making skills required in management positions. Examination of the various concepts of management and the basic functions of management-planning, organizing, motivating and controlling. The planning of goals, changes, progression of people, and the managerial value systems will be investigated.

BA 331 Organizational Behavior and Development (3) Development of knowledge and skill in the application of behavioral science theories and concepts to organizational processes and problems. Emphasis is on small group, intrapersonal, interpersonal, intergroup, managerial, and whole organizational issues and problems. Prerequisite: BA 330.

BA 441 Database Design and Management (3) This course provides management-oriented introduction to database systems. Theoretical foundations necessary for understanding of hierarchical, network and relational models are provided. Various approaches to database design are presented, with emphasis on normalization and data modeling. Course concepts are reinforced by the use of cases and projects. The basics of SQL are covered, and technical aspects of database administration are examined. Prerequisite: BA 342 or any other programming course.

BA 442 Principles of Systems Analysis and Design (3) Tools and methods of systems analysis and design as well as issues relating to systems implementation are presented. Coverage includes a review of the traditional life cycle methodology, along with newer methods used in the field. The course will expose students to computer aided system development tools. Prerequisite: BA 441 or CSC 305.