## COMPUTER SCIENCE

|  |  |
| --- | --- |
| **CSCI 1003 - Introduction to Technology ..............2.00 Credits**  An introduction to trends in technology including computers and peripheral devices, functional units, operating systems, computer language, computer applications, hardware, software, mouse, LCD panels, CD-ROMS, scanners and categories of printers. (Optional course).  **CSCI 1101 - Introduction to Computers ..............3.00 Credits** This course covers the general computer concepts. This includes computer hardware and software, peripheral devices, the internet and electronic mail. Application software packages such as word- processing, spreadsheet, web page and development will be included.  *Prerequisite: none*  **CSCI 1201 - Intro to Computer Science ...............3.00 Credits** The course covers an introduction to the field of Computer Science. Topics to be covered include data representation, hardware, software, problem solving and algorithm design, an overview of operating systems, and web page design.  **CSCI 1301 - Computer Science I ..................4.00 Credits** This course is an overview of computers and programming; problem- solving and algorithm development; simple data types; arithmetic and logical operators; selection structures; text files; arrays; procedural abstraction and software design; modular programming. A high level programming language (currently Java) will be used.  *Prerequisites: CSCI 1201* .  **CSCI 1302 - Computer Science II........................4.00 Credits**  This course is an overview of abstract data types; multi- dimensional arrays and records; sets and strings; binary searching and sorting; introductory algorithm analysis; recursion; pointers and linked lists; software engineering concepts; dynamic data structures. A high level programming (currently JAVA) will be used.  *Prerequisite: CSCI 1301.*  **CSCI 2030 - Introduction to Computer**  **Engineering………………………………………..3.00 Credits**  Computer systems and digital design principles. Architectural concepts, software, Boolean algebra, number system, combinatorial data path elements, sequential logic, and storage elements. Design of DRAM control and I/O bus.  *Prerequisite: CSCI 1201.*  **CSCI 2211 - Visual Basic Programming.............3.00 Credits** This course covers the fundamentals of Visual BASIC controls, object types, events, and methods. Topics include creating user interface, setting properties, designing class modules, introduction of Visual BASIC front-end applications for database.  *Prerequisite: CSCI 1301.*  **CSCI 2231 - COBOL Programming......................4.00 Credits**  This course examines the COBOL language. It includes such topics as program design, program planning, flowcharting, the COBOL programming statements, sorting, file handling, lists, tables, and the generation of reports. It also concentrates on preparing IPO charts, constructing hierarchy charts, designing files, designing screens for input and output, designing forms for printer output, sequential file updating, indexed sequential file processing, writing efficient file editing routines, and algorithm development.  *Prerequisite: CSCI 1201 or permission of instructor.*  **CSCI 2300 - Computational Informatics I……….3 Credits**  This course offers an introduction to computational informatics science of how information is represented and transmitted in biological systems. Students will learn Biological Technical Scenes, Patterns and Downloading Datasets (Protein Databanks, SWISS-PROT, EMBL and GenBank), Database Management (Pharmacogenomics and Aggression), Search Engines Algorithms (Intelligent Agents and User Interface Tools Programming with PERL Database), Data Mining (Statistics and Sampling), Web Technologies (Internet Sequence Retrieval System) and Data Visualization (Animation and Visualization Tools)  *Prerequisite: BIOL 1111 or permission of instructor*  **CSCI 2311 - Advanced Visual Basic Programming..3 Credits**  Advanced Visual Basic will incorporate the basic concepts of programming and the design techniques of an object oriented language. It covers advanced internet and user interface features and applications; error handling; graphics, database, and XML applications. A second course is needed to cover the database concepts, web applications and advanced programming techniques. The general elective credit hours will increase and the institution’s overall degree requirement will not be affected.  *Prerequisite: CSCI 2211*  **CSCI 3111 - Discrete Structures ..........................3.00 Credits** This course includes topics such as logic, sets, relations, functions, counting techniques, mathematical induction, graphs representation, combinatorial problems, elementary graph theory, network work flow, recursion and finite state machine.  *Prerequisite: CSCI 1301*  **CSCI 3122 - Data Structures ..............................3.00 Credits** This course is a study of the basic concepts and the representation of data using the language C++, such as static and dynamic allocations, trees, and graphs, storage systems and structures, searching and sorting techniques.  *Prerequisite: CSCI 1302 or permission of instructor.*  **CSCI 3132 - Database Management ..................3.00 Credits**  This course concentrates on defining and designing database systems. It covers such types as data modeling, management algorithms, query language, record insertion and deletion, sorting, creation of indexes, updating the database, and implementing the database.  *Prerequisite: CSCI 1302.*  **CSCI 3200 - Design & Analysis of Algorithms … 3 Credits**  This course is about the systematic study of the design and analysis of algorithms. The course covers the fundamental techniques used to design efficient algorithms with the analysis of the efficiency. It covers several group of algorithms, such as graph, search, computational, genetic, sorting, heuristic and approximate algorithms.  *Prerequisite: CSCI 3122*  **CSCI 3211 - Computer Org & Architecture I...3.00 Credits** This course is the study of hardware and software concepts of digital computer systems, with emphasis on fundamental system software and details of hardware operation. Topics include virtual machines, system organization, digital logic and assembly language programming.  *Prerequisite: CSCI 1301* | **CSCI 3212 - Computer Org & Architecture II..3.00 Credits** This course is the continuation of Computer Organization I. Topics include instruction and data formats, addressing modes, instruction types, flow of control, micro-programming, and advanced computer architecture, including RISC machines and parallel architecture.  *Prerequisite: CSCI 3211 .*  **CSCI 3300 - High Performance Computing………3 Credits**  The course provides sufficient justification to investigate the concept of parallel processing. The course covers four steps that are involved in performing a computational problem in parallel: architecture, algorithm, map the problem into a suitable parallel computer, and writing a parallel program utilizing an applicable parallel programming approach. The applications are representative of a host of situations in which the probability of success in performing a computational task is increased through the use of parallel processing.  *Prerequisite: CSCI 3211*  **CSCI 4113 - Operating Systems .........................3.00 Credits** This course involves the operating system architecture and the manner in which computer operating systems interact with machine hardware to provide a total system. The study of operating systems by combining a careful examination of theoretical issues with real-world, hands-on problems and examples. The implementation examples are drawn from the commercial operating systems.  *Prerequisite : CSCI 3122 .*  **CSCI 4123 - Computer Networks .....................3.00 Credits** This course is the study of Network Planning and Network Design, Understanding Networks by understanding their components and their functions, and defining different Network Operating Systems. This course provides insight into new technologies, such as ATM, ISDN, and wireless networks. The implantation examples are drawn from the commercial network operating systems.  *Prerequisite: CSCI 4113.*  **CSCI 4151 - Systems Simulation....................3.00 Credits**  An introduction to problem solving using simulation methods and tools. Topics include construction of deterministic and stochastic models, identification of system parameters, correlation of models and systems.  *Prerequisite: CSCI 3122.*  **CSCI 4211 - Systems Analysis I ..........................3.00 Credits** This course provides the students with an introduction to technical and management issues in systems analysis and design. The course covers various issues in the Systems Development Life Circle (SDLC) model, CASE tools and their impact on SDLC, the systems analyst and the different roles of a systems analyst in an organization. It introduces students to various information gathering techniques, tools for project management, issues and models for sampling data sources, ER diagrams, data flow diagrams and data dictionaries. It includes an in-depth treatment of prototyping. It also covers issues in decision-making, process specification techniques and principles of structured design.  *Prerequisite: CSCI 1302 .*  **CSCI 4212 - Systems Analysis II ...................3.00 Credits** This course is a continuation of the introductory course in systems analysis and design. The course provides an in-depth treatment of objected-oriented analysis and design concepts as applied to systems development. It introduces the students to various tools used in design and analysis of large software systems. It covers various issues in designing effective inputs and outputs, data-entry procedures, designing user interfaces and a comprehensive overview of the different types of dialogues and queries for interface design. Related issues in quality assurance, user training and evaluation techniques are also discussed.  *Prerequisites: CSCI 4211*  **CSCI 4221 - Software Engineering ..............3.00 Credits** This course provides an introduction to software engineering methodologies, addressing each phase in the life cycle of software. Topics include system and software analysis, design, implementation and maintenance, software system development and management. CASE tools will be discussed also.  *Prerequisite: CSCI 3122 .*  **CSCI 4311 - Computer Graphics .......................3.00 Credits**  This course will provide students with the basic knowledge and experience necessary to use computers to create graphics and to process images. The hardware and software components of graphics systems are examined with a major emphasis on methods for design of 2-D and 3-D graphics. Algorithms for creating and manipulating graphics displays and techniques for implementing the algorithm are introduced.  *Prerequisite: CSCI 3122 .*  **CSCI 4411 - Artificial Intelligence ................3.00 Credits** This course covers the basic concepts of artificial intelligence including production systems, knowledge representation, pattern matching, heuristic search, and logical and probabilistic reasoning. The social, cultural, and economic impact of artificial intelligence are discussed.  *Prerequisite: CSCI 3111*  .  **CSCI 4911 - Special Topics CSC/Computer**  **Information Systems.............................................3.00 Credits** This course covers current topics in Computer Science and Computer Information Systems of special interest to faculty and students.  *Prerequisite: Permission of instructor.*  **CSCI 4915 - Web Design and Development .....3.00 Credits** This course will cover the fundamental concepts of web development. The study of the theory and languages related to Web Design and Development will also be discussed. Topics include client/server architecture, W3C HTML 4 specifications, CSS, DHTML, XML, VB and Java Scripts, Active Serve Page and PHP: Hypertext Preprocessor.  *Prerequisite(s): CSCI 3122 and CSCI 2211.*  **CSCI 4921 - Senior Project I …………..…………. 1 Credits**  In this course, students will broaden their educational experience by reading and understanding technical literature in the areas of mathematics and computer science, organizing and writing a professional-level proposal, attending seminars and preparing a professional-level presentation. Students will draw upon and synthesize knowledge from their previous course work. Though revision of both the proposal and the oral presentation, students will improve their ability to communicate the main ideas.  *Prerequisite: Senior Students*  **CSCI 4922 - Senior Project II …………………… 2 Credits**  In this course, students will broaden their educational experience by reading and understanding technical literature in the areas of mathematics and computer science, organizing and writing a professional-level paper, project implementation and coding, attending seminars and preparing a professional-level presentation. Project implementation should satisfy all requirements mentioned in the approved proposal accomplished during the course CSCI 4921. Students will draw upon and synthesize knowledge from their previous course work and educational experience.  *Prerequisite: Senior Students and CSCI 4921* |