COMPUTER SCIENCE AND APPLICATION SYSTEMS

Academic Year

2014-2015

School

School of Science, Engineering and Technology School Web site

School Dean

Winston F. Erevelles, Ph.D. werevelles@stmarytx.edu

Department

Computer Science

Department Chair

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Description of Program/Major

Computer Science studies digital computer hardware and software and emphasizes the software development process (computer programming) used to solve problems. A computer program implements an algorithm which specifies exactly how input data is converted to output data required by the problem being solved. The computer science major learns about computer architecture and about how to write programs to solve problems important to industry, government, military, and entertainment. Computers are ubiquitous in today's society, so entry-level job opportunities abound for computer science graduates, including writing business and scientific applications, developing operating systems, programming database applications, writing software for embedded control systems, and developing smart phone apps.

The **Department of Computer Science** offers four undergraduate degree programs. The four degrees are identical with respect to upper division Computer Science and St. Mary's Core curriculum requirements, but differ with respect to minor:

- ***Bachelor of Science in Computer Science*** with a minor in Mathematics for students interested in a career writing scientific and/or gaming programs.
- ***Bachelor of Arts in Computer Information Systems*** (minor in Business) for students interested in applying computers to business-related problems.
- ***Bachelor of Arts in Computer Science/Application Systems*** (unrestricted minor) for students who want the flexibility to choose their minor.

Degree Requirements

Core Curriculum (SMC)

St. Mary's University Core (30 Hours)
All St. Mary's Core SMC13## "Reflection" courses must be completed before registering for SMC23## "Practice" courses. "Reflection" courses can be taken in any order followed by "Practice" courses in any order.

SMC 1301	Foundations of Civilization	3
SMC 1311	Foundations of Reflection: Self	3
SMC 1312	Foundations of Reflection: Nature	3
SMC 1313	Foundations of Reflection: Others	3
SMC 1314	Foundations of Reflection: God	3

SMC 2301	Foundations of Practice: Ethics	3
SMC 2302	Foundations of Practice: Civic Engagement and Social Action	3
SMC 2303	Foundations of Practice: Fine Arts and Creative Process	3
SMC 2304	Foundations of Practice: Literature	3
SMC 4301	Capstone Seminar: Prospects for Community and Civilization	3

School Specific Core (SSC)

School of Science, Engineering, and Technology Specific Core (21 Hours)

Speech	SE 1321 (for international students), SE 1341, SE 2333, SE 3391	3
Composition and Rhetoric (grade of "C" or better)	EN 1311, EN 1313 (for international students)	3
Foreign Languages	Six hours at the sophomore level (2311, 2312) in a Foreign Language previously studied for a minimum of one year; Or, 6 hours of introductory level (1311, 1312) in a Foreign Language not previously studied; Or, 12 hours of CLEP credit for a language previously studied.	6
Social Science	BA 1310, BA 3325, CJ 2300, CJ 3300, EC 2301, EC 2303, PO 1311, PO 1312, PO 1314, PS 1301, PS 3386, SC/CR 1311, SC 3321, HU 3300, HU 3303	3
Theology	Advanced Theology 33XX	3
Fine Arts	AR, DM, MU or Literature: EN 2321, 2322, 2353, 2354, 2355, 2356	3

Four Year Degree Plan

Sample Degree Plan

Department Courses and Descriptions

CS 1300
Introduction to Computers (3)
Survey of computer systems and their integration and application in society. The fundamentals of software are discussed and applied through word processing, data base and spread sheet applications. (Note: Successful completion of this course does not meet University IT proficiencies requirement.)

CS 1310
Programming I (4)
Fundamentals of the software development process with emphasis on program design (algorithm development), structured programming techniques and code and test using a structured, modular programming language.

CS 1311
Programming II/Data Structures (4)
Properties, representation, and manipulation of internal information structures including lists, queues, stacks, trees, and net works. Prerequisite: CS 1310.

CS 1320
Topics in Programming Languages (3)

Designing, coding and testing computer programs using language specific commands. May be repeated as topics change.

CS 2313
Object Oriented Programming I (3)
Object oriented programming (OOP) using C++. Prerequisite: CS 1311.

CS 2315
Algorithms (3)
The theory, design, analysis, implementation and application of fundamental and advanced computer algorithms. Prerequisite: CS 1311.

CS 2323
Object Oriented Programming II (3)
Fundamentals of Object Oriented modeling, analysis (OOA) and design (OOD) techniques including process and notation. Using C++ for graphical user interface development with MFC. Prerequisite: CS2313

CS 2350
Computer Architecture (3)
Logical organization and design of digital computer hardware. Prerequisite: CS2315

CS 3310
Intro to Systems Analysis and Design (3)
An introduction to the use of current methodologies for the analysis and design of various types of systems. Methodologies studied involve the traditional approach as well as the object-oriented approach to analysis and design, which includes use of Universal Markup Language (UML).

CS 3311
Compilers (3)
Design and implementation of compilers. Prerequisite: CS1311

CS 3335
Survey of Programming Languages (3)
Survey of existing high-level programming languages with emphasis on language concepts. Prerequisite: CS2323

CS 3340
Software Engineering (3)
Engineering approach to software development including techniques for software planning, systems analysis, design, structured programming, program testing and program maintenance. Prerequisite: CS2315

CS 3350
Operating Systems (3)
The study of the design and implementation of computer-based operating systems, including issues in process, memory, and storage management, as well as security. Prerequisites: CS1311 and CS2350

CS 4175

Advanced Topics (1)
Advanced topics in Computer Science. May be repeated for credit when topics vary. Prerequisite: Instructor permission.

CS 4275
Advanced Topics (2)
Advanced topics in Computer Science. May be repeated for credit when topics vary. Prerequisite: Instructor permission.

CS 4315
Artificial Intelligence (3)
Survey of computer systems designed to exhibit intelligent behavior. Prerequisite: CS1311.

CS 4320
Files & Databases (3)
The design, implementation, and manipulation of files, data bases, and DBMS. Prerequisite: CS2315

CS 4325
Computer Graphics (3)
The study and implementation of computer imaging and techniques for representation, manipulation and display of graphical objects. Prerequisite: CS1311

CS 4330
Data Communication (3)
The study of designing, implementing, and manipulating data communications with special emphasis on networks and their protocols. Prerequisite: CS2315

CS 4375
Advanced Topics (3)
Advanced topics in Computer Science. May be repeated for credit when topics vary. Prerequisite: CS1311.

CS 4395
Senior Project (3)
Application of software engineering techniques to a comprehensive computer software development project. Prerequisite: CS 3340 and Senior standing or higher.

Department Faculty

Computer Science and Application Systems Faculty Website

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