

This document is not intended to be a complete list of all requirements and is not a substitute for the Undergraduate Program Catalog. All students are presumed to have read the information in the Undergraduate Program Catalog, which is the final authority.

ELECTRONIC ACCESS TO UNDERGRADUATE PROGRAM INFORMATION

Information about the undergraduate program is available on the web at <http://www.cis.fiu.edu/> . If you have questions, please send them to either advising@cis.fiu.edu or info-undergrad@fiu.edu .

GENERAL DEGREE INFORMATION

The School of Computing and Information Sciences offers curricula leading to the following degrees:

The **Bachelor of Science in Computer Science** provides an introduction of the theoretical foundations of computer science. Graduates of this program often conduct research work in industry as software developers.

The **Bachelor of Science in Information Technology** as a single major prepares students for entry-level jobs in support positions within companies, so they can manage company computer systems, networks, databases and web sites.

The **Bachelor of Arts in Information Technology** as a second major can be earned by a student who is either pursuing a major in another field or who has already earned a Bachelor's degree.

The **Minor in Computer Science** can be used to provide a minimal level of theoretical and practical computer science skills for students majoring in other fields.

ACCREDITATION

The Bachelor of Science program in Computer Science is accredited by:

Computing Accreditation Commission

ABET, 111 Market Place, Suite 1050

Baltimore, MD 21202-1012

Telephone 410-347-7700

For assessment information, visit <http://www.cis.fiu.edu/programs/undergrad/cs/assessment/> and <http://www.cis.fiu.edu/programs/undergrad/it/assessment/> .

SCIS RESEARCH INTERESTS

Database Systems: including database design, database management systems and applications, database theory and implementation, database machines, distributed databases, and information retrieval in heterogeneous databases.

Operating systems: distributed computing, storage systems, virtualization, security, and real-time systems.

Software Engineering: including large-scale software design, programming language environments, software development and maintenance methodologies, object-oriented techniques, software reuse, and software quality assurance.

Parallel and Distributed Systems: including formal specification methodologies, distributed file systems and operating systems, and parallel algorithms.

Theory: including data structures and analysis of algorithms, theory of computation, program verification, and logic.

Artificial Intelligence: including neural networks, expert systems, automated reasoning, term rewriting systems, and intelligent tutoring systems.

Security: including stealthy malware detection and defense, runtime integrity of systems software, information flow security, and software security vulnerability mitigation

Networking: including simulation and modeling of large-scale computer networks, quality-of-service management, wireless networks, mobile computing, and high-performance routing

Bioinformatics: pattern discovery in sequences and structures, micro-array data analysis, primer design, probe design, phylogenetic analysis, image processing, and image analysis

COMPUTING RESOURCES

The School of Computing and Information Sciences provides several computing labs to service the curriculum needs of our undergraduate students. For more information about the John C. Comfort Laboratory (JCCL, ECS 241) and our other undergraduate computing resources and services, please visit our website at: <http://www.aul.fiu.edu> .

The JCCL is an open learning facility for undergraduate students of the School of Computing and Information Science. This laboratory is equipped with 46 Intel Core2Duo, 2.4ghz class computers that run either Windows XP or Red Hat Linux. A recent addition to this lab includes two 42-inch flat panel displays available to students for collaboration or presentation assignments. This lab has been designed to give students a broad exposure to the Windows XP environment including programming using Microsoft Visual Studio, NetBeans, and Eclipse.

The Experimental Lab or ExLab, (located in ECS 281), can be employed to meet a variety of curriculum computing needs. It is used by undergraduates as an additional open lab, but is also scheduled for class meetings if there is a need for some "hands-on" work in a lab environment. Schedules are posted on the door.

The Instructional Lab (ILab, room ECS141) supports courses that have a programming lab component. The ILab is equipped with 47 Intel Core2Duo 3.0ghz class computers. The ILab is a closed lab and is only available to students for scheduled course meetings.

The IT Hardware Lab in ECS 237 is a closed lab designed to accommodate courses that require manipulation of computer components or networking technologies. This room contains 30 workstations, which students can "tear down" and rebuild in their course work. This room also houses the networking lab where students build and troubleshoot networks.

ONLINE COURSE OFFERING

Some courses may be offered fully online, for an entire listing you may go to <http://onlineapps.fiu.edu/coursecatalog/> and search in the "College of Engineering and Computing" under the "School of Computer Science".

General Requirements

University Requirements

All students must complete the **Academic Degree Requirements** and **Summer Enrollment Requirement** as explained in the FIU catalog:

<http://catalog.fiu.edu/index.php?id=2727§ion=academicpolicies>

All students must complete the University Core Curriculum, CLAS and Foreign Language Requirement as explained in the FIU catalog:

<http://catalog.fiu.edu/index.php?id=2812§ion=studentservices>

College of Engineering Requirements

All students must complete the General Requirements for a Baccalaureate Degree in the College of Engineering as explained in the FIU catalog:

<http://catalog.fiu.edu/index.php?id=2239§ion=collegesandschools&college=1&parent=2239>

In particular, students must complete at least 35 semester credits in the upper-division at FIU.

SCIS Requirements

If a student takes a course at FIU and has already received transfer credit for an equivalent course at another institution, then the credits for the repeated course at FIU are not applicable toward graduation.

At least 50% of the upper division credits required for the degree must be taken at FIU.

A grade of "C" or better must be obtained in **all** courses required for the major.

Note: A "C-" is **not** an acceptable grade.

Additional Requirements

Additional Requirements for Computer Science majors in both tracks:

No computer-related courses in other departments (including CGS 3300) may be taken for elective credit by a CS major, unless specifically approved in writing by the student's advisor.

No credit for graduation will be given to CS majors for the following courses:

COP 3175, CGS 2060, CGS 3300, STA 1013, STA 2023, STA 2122, STA 3123, MAC 2233, QMB 3200 and ESI 3161 unless the student took the course before declaring a CS major.

Most of the IT classes cannot be taken for credit for Computer Science majors. The only exceptions are CGS 4285, CGS 4854, COP 4005, COP 4722, COP 4723, COP 4813.

Degrees Offered

Bachelor of Science in Computer Science, Computer Science Track

Bachelor of Science in Computer Science, Software Design Track

Bachelor of Arts in Information Technology

Bachelor of Science in Information Technology, Information Technology Major

Bachelor of Science in Information Technology, Software Major

Minor in Computer Science

Bachelor of Science in Computer Science

Computer Science Track

There are two tracks available in the upper division program for Computer Science. The Computer Science (CS) track should be followed by the student who intends to continue on to graduate study in computer science. The Software Design and Development (SDD) track may be followed by the student who intends to pursue a software engineering career. This section explains the requirements for the Computer Science track.

Prerequisites

Students must complete Computer Programming in Java or C++ at an acceptable level, Calculus through infinite series (and including trigonometric functions), and Physics. For a student who has not completed these prerequisites, the courses at FIU that satisfy them are:

COP 2210	Computer Programming I	PHY 2048	Physics with Calculus I w/Lab
MAC 2311	Calculus I	PHY 2049	Physics with Calculus II w/Lab
MAC 2312	Calculus II		

CS Core Courses

CDA 4101	Structured Computer Org.	COP 4338	Computer Programming III
CEN 4010	Software Engineering I	COP 4540	Database Management
CGS 1920	Introduction to Computing	COP 4555	Principles of Prog. Languages
CGS 3092	Ethics/Soc in Computing	COP 4610	Operating Systems Principles
CIS 4911	Senior Project	COT 3420	Logic for Computer Science
COM 3110	Business Prof. Communications	ENC 3213	Prof. and Technical Writing
COP 3337	Computer Programming II	MAD 2104	Discrete Mathematics
COP 3402	Fundamentals of Computer Sys.	MAD 3512	Intro to Theory of Algorithms
COP 3530	Data Structures	STA 3033	Intro to Prob. and Stat. for CS

CS Elective Courses

CS students must have **three** elective courses.

Set 1 Electives: Choose **two** from this list:

CAP 4770	Data Mining	COP 4225	Advanced UNIX Programming
CEN 4021	Software Engineering II	COP 4226	Advanced Windows Programming
CEN 4072	Software Testing	COP 4520	Intro to Parallel Computing
CNT 4513	Data Communications		

Set 2 Electives: Choose **one** from this list:

MAD 3305	Graph Theory	MAD 4203	Introduction to Combinatorics
MAD 3401	Numerical Analysis	MHF 4302	Mathematical Logic

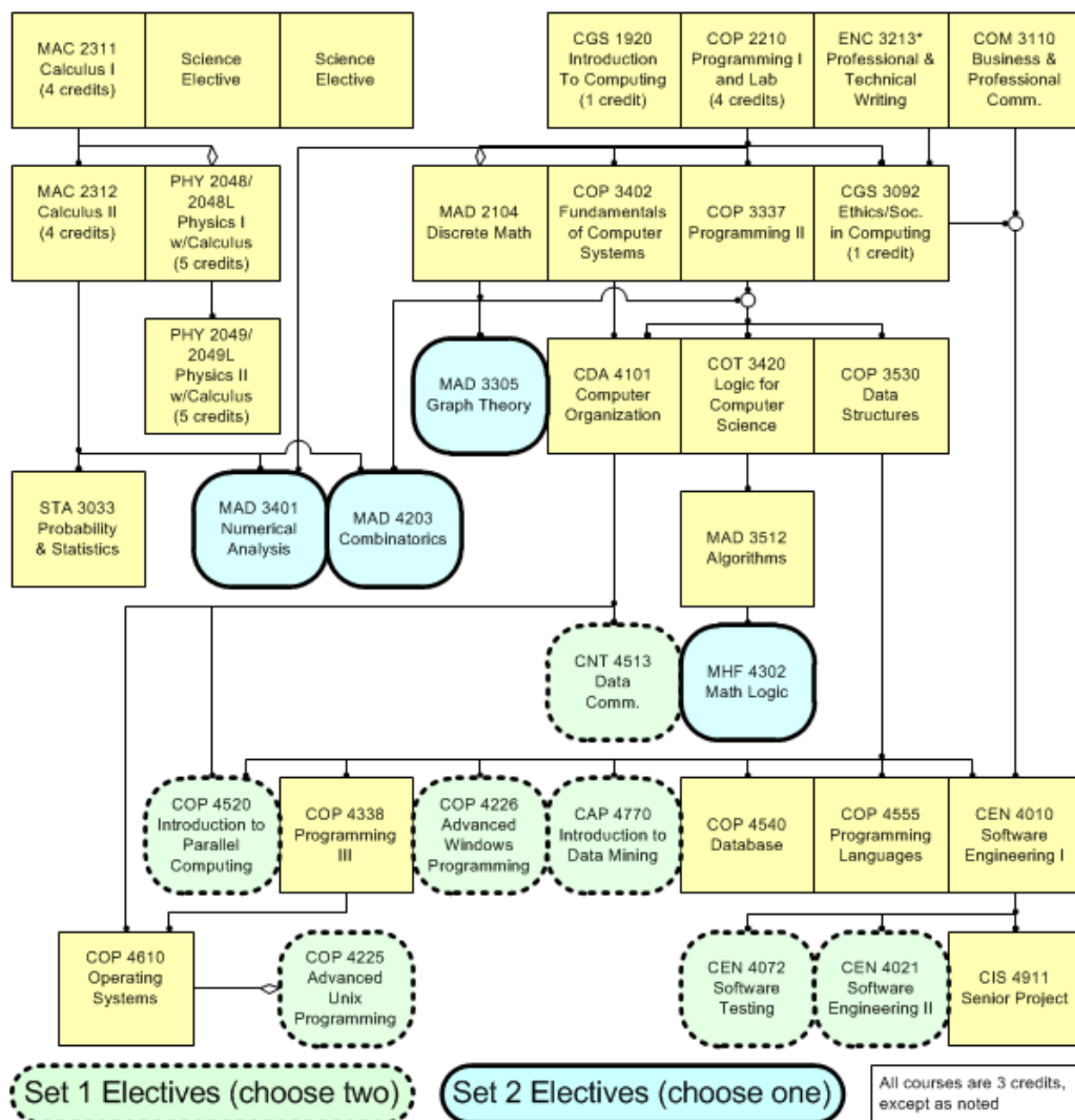
CS Science Elective Courses

CS students are required to take **two** additional one-semester courses in science for science majors with strong emphasis on quantitative methods

AST 2003	Solar System Astronomy	GLY 4450	Exploration Geophysics w/lab
AST 2004	Stellar Astronomy	MCB 2000	Introductory Microbiology
BOT 1010	Introductory Botany	OCB 2003	Introductory Marine Biology
BSC 1010	General Biology I	OCE 3014	Oceanography
BSC 1011	General Biology II	PCB 2061	Introductory Genetics
CHM 1045	General Chemistry I	PHY 3123	Modern Physics I
CHM 1046	General Chemistry II	PHY 3124	Modern Physics II
GLY 1010	Intro to Earth Science	PHY 3513	Thermodynamics
GLY 1100	Historical Geology	PHY 4323	Inter. Electromagnetism I
GLY 3754	Remote Sensing in Earth Sci.	PHY 4324	Inter. Electromagnetism II
GLY 4400	Structural Geology		

Bachelor of Science in Computer Science

Computer Science Track



A line indicates a prerequisite. The course above must be completed before the course below can be taken.

A diamond indicates a co-requisite. The course closer to the diamond may be taken at the same time as the co-requisite. The co-requisite is a prerequisite for any course that requires the course closer to the diamond.

A junction is where multiple prerequisites are joined.

* ENC 3213 prerequisites: complete the UCC English requirements

Effective 08/2010

Bachelor of Science in Computer Science

Computer Science Track

Plan of Study

Freshman Year - 30 Credits

CGS 1920 - Introduction to Computing (1 credit)
MAC 2147 - Pre-calculus, if needed, or General Electives (3 credits)
MAC 2311 - Calculus I (4 credits)
MAC 2312 - Calculus II (4 credits)
CS Science Elective (3 credits)
UCC courses (15 credits)

Sophomore Year - 30 credits

COP 2210 - Computer Programming I (4 credits)
PHY 2048/PHY 2048L - Physics I w/Calculus (5 credits)
PHY 2048/PHY 2048L - Physics II w/ Calculus (5 credits)
MAD 2104 - Discrete Mathematics (3 credits)
UCC Life Science and Lab (4 credits) Choose from: BSC 1010, BOT 1010, MCB 2000, OCB 2003 and corresponding lab
UCC courses (6 credits)
General Electives (3 credits)

Junior Year - 30 credits

COP 3402 Fundamentals of Computer Systems (3 credits)
COP 3337 Computer Programming II (3 credits)
ENC 3213 - Professional and Technical Writing (3 credits)
COM 3110 Business and Professional Communications (3 credits)
STA 3033 - Introduction to Probability and Statistics for CS (3 credits)
CGS 3092 Professional Ethics and Social Issues in Computing (1 credit)
COP 3530 - Data Structures (3 credits)
COT 3420 - Logic for Computer Science (3 credits)
CDA 4101 - Structured Computer Organization (3 credits)
CS Elective (3 credits) General Electives (2 credits)

Senior Year - 30 credits

COP 4338 - Computer Programming III (3 credits)
MAD 3512 - Theory of Algorithms (3 credits)
CEN 4010 - Software Engineering (3 credits)
COP 4555 - Principles of Programming Languages (3 credits)
COP 4540 - Database (3 credits)
COP 4610 - Operating Systems Principles (3 credits)
CIS 4911 - Senior Project (3 credits)
CS Electives (6 credits)
General Electives (3 credits)

For students who are deficient in a foreign language, the general electives should include a two-semester sequence in one foreign language.

Students are required to earn at least nine credit hours prior to graduation by attending one or more summer semesters at FIU or any other University in the Florida State system.

Bachelor of Science in Computer Science

Software Development Track

There are two tracks available in the upper division program for Computer Science. The Computer Science (CS) track should be followed by the student who intends to continue to graduate study in computer science. The Software Design and Development (SDD) track may be followed by the student who intends to pursue a software engineering career. This section explains the requirements for the Software Design track.

Prerequisites

Students must complete Computer Programming in Java or C++ at an acceptable level, Calculus through infinite series (and including trigonometric functions), and Physics. For a student who has not completed these prerequisites, the courses at FIU that satisfy them are:

COP 2210	Computer Programming I	PHY 2048	Physics with Calculus I w/Lab
MAC 2311	Calculus I	PHY 2049	Physics with Calculus II w/Lab
MAC 2312	Calculus II		

SDD Core Courses

CDA 4101	Structured Computer Org.	COP 3530	Data Structures
CEN 4010	Software Engineering I	COP 4338	Computer Programming III
CEN 4021	Software Engineering II	COP 4540	Database Management
CEN 4072	Software Testing	COP 4555	Principles of Prog. Languages
CGS 1920	Introduction to Computing	COP 4610	Operating Systems Principles
CGS 3092	Ethics/Soc in Computing	COT 3420	Logic for Computer Science
CIS 4911	Senior Project	ENC 3213	Prof. and Technical Writing
COM 3110	Business Prof. Communications	MAD 2104	Discrete Mathematics
COP 3337	Computer Programming II	MAD 3512	Intro to Theory of Algorithms
COP 3402	Fundamentals of Computer Sys.	STA 3033	Intro to Prob. and Stat. for CS

SDD Elective Courses

Choose **one** from this list:

CAP 4770	Data Mining	COP 4226	Advanced Windows Programming
CNT 4513	Data Communications	COP 4520	Intro to Parallel Computing
COP 4225	Advanced UNIX Programming		

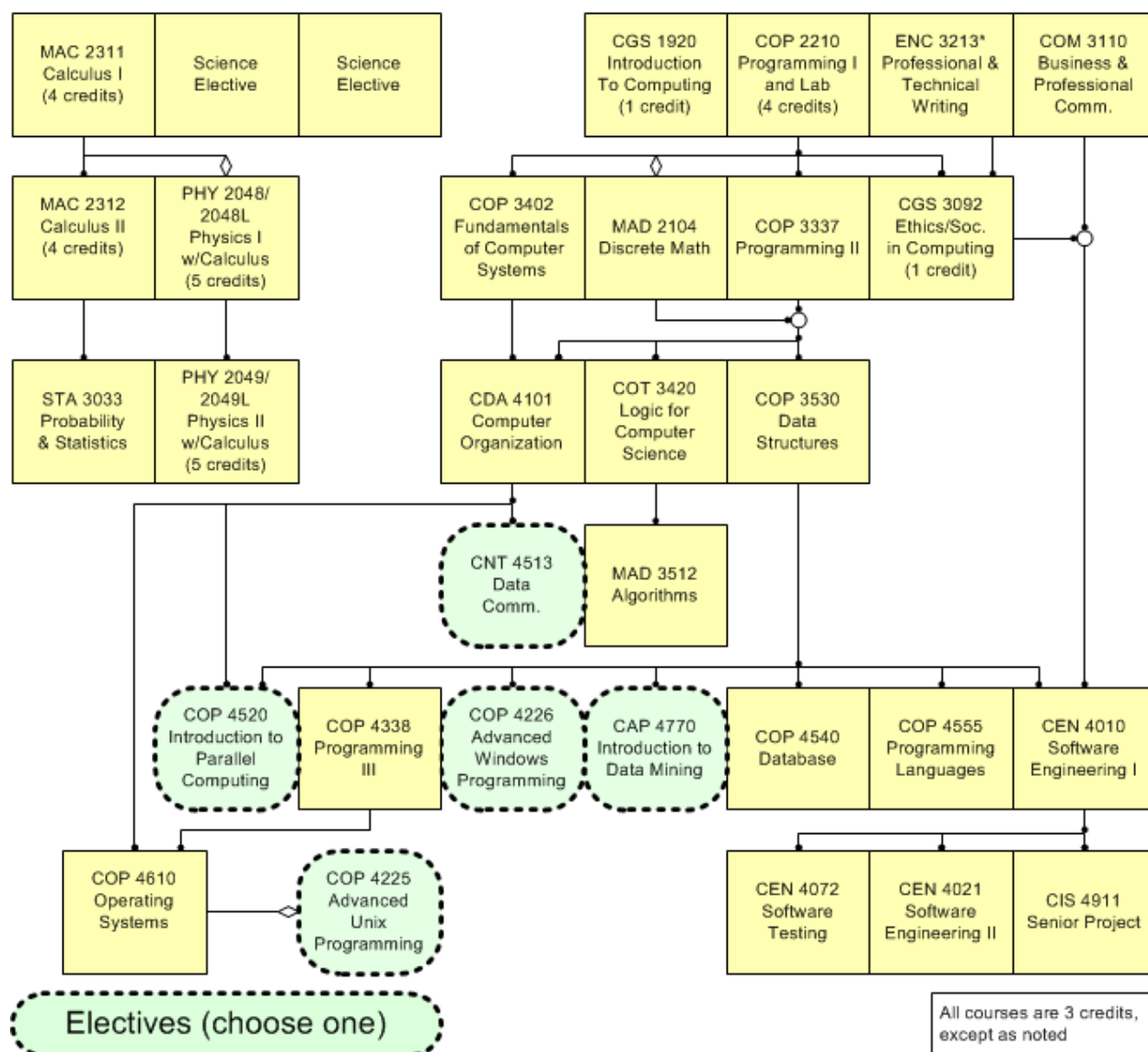
SDD Science Elective Courses

CS students are required to take **two** additional one-semester courses in science for science majors with strong emphasis on quantitative methods

AST 2003	Solar System Astronomy	GLY 4450	Exploration Geophysics w/lab
AST 2004	Stellar Astronomy	MCB 2000	Introductory Microbiology
BOT 1010	Introductory Botany	OCB 2003	Introductory Marine Biology
BSC 1010	General Biology I	OCE 3014	Oceanography
BSC 1011	General Biology II	PCB 2061	Introductory Genetics
CHM 1045	General Chemistry I	PHY 3123	Modern Physics I
CHM 1046	General Chemistry II	PHY 3124	Modern Physics II
GLY 1010	Intro to Earth Science	PHY 3513	Thermodynamics
GLY 1100	Historical Geology	PHY 4323	Inter. Electromagnetism I
GLY 3754	Remote Sensing in Earth Sci.	PHY 4324	Inter. Electromagnetism II
GLY 4400	Structural Geology		

Bachelor of Science in Computer Science

Software Design Track



Bachelor of Science in Computer Science

Software Development Track

Plan of Study

Freshman Year - 30 Credits

CGS 1920 - Introduction to Computing (1 credit)
MAC 2147 - Pre-calculus, if needed, or General Electives (3 credits)
MAC 2311 - Calculus I (4 credits)
MAC 2312 - Calculus II (4 credits)
CS Science Elective (3 credits)
UCC courses (15 credits)

Sophomore Year - 30 credits

COP 2210 - Computer Programming I (4 credits)
PHY 2048/PHY 2048L - Physics I w/Calculus (5 credits)
PHY 2048/PHY 2048L - Physics II w/ Calculus (5 credits)
MAD 2104 - Discrete Mathematics (3 credits)
UCC Life Science and Lab (4 credits) Choose from: BSC 1010, BOT 1010, MCB 2000, OCB 2003 and corresponding lab
UCC courses (6 credits)
General Electives (3 credits)

Junior Year - 30 credits

COP 3402 - Fundamentals of Computer Systems (3 credits)
COP 3337 - Computer Programming II (3 credits)
ENC 3213 - Professional and Technical Writing (3 credits)
COM 3110 - Business and Professional Communications (3 credits)
STA 3033 - Introduction to Probability and Statistics for CS (3 credits)
COP 3530 - Data Structures (3 credits)
COT 3420 - Logic for Computer Science (3 credits)
CDA 4101 - Structured Computer Organization (3 credits)
CGS 3092 - Professional Ethics and Social Issues in Computing (1 credit)
General Electives (5 credits)

Senior Year - 30 credits

COP 4338 - Computer Programming III (3 credits)
MAD 3512 - Theory of Algorithms (3 credits)
CEN 4010 - Software Engineering (3 credits)
COP 4540 - Database (3 credits)
COP 4555 - Principles of Programming Languages (3 credits)
COP 4610 - Operating Systems Principles (3 credits)
CEN 4021 - Software Engineering II (3 credits)
CEN 4072 - Software Testing (3 credits) CIS 4911 - Senior Project (3 credits)
CS Elective (3 credits)

For students who are deficient in a foreign language, the general electives should include a two-semester sequence in one foreign language.

Students are required to earn at least nine credit hours prior to graduation by attending one or more summer semesters at FIU or any other University in the Florida State system.

Bachelor of Science in Computer Science

Combined BS/MS: 4 Plus 1

Admission Requirements

Current enrollment in the Bachelor's Degree program in Computer Science at FIU.

Completed at least 75-90 credits of course work, and students must not have started their last 30 credits.

Current GPA must be 3.3 or higher.

GRE general test score of 1000 (verbal and quantitative combined), with a minimum quantitative score of 600.

Three letters of recommendation.

Approval of the Graduate Committee.

General Requirements

The FIU Bachelor's degree in Computer Science must be awarded before the Master's degree.

Required Courses

Required courses must be completed with an average of "B" or higher, and only one course may receive a grade less than "B-".

CEN 5011 Advanced Software Engineering	COT 5420 Theory of Computation I
COP 5725 Principles of Database Management	COT 5407 Introduction to Algorithms
COP 5614 Operating Systems	

Elective Courses

Select five courses intended for computer science graduate majors, from the SCIS Graduate Course Offerings.

Overlap Courses

Up to 4 courses (12 credits) may be used in satisfying both the Bachelor's and Master's degree requirements. All overlapping courses must be approved by both graduate and undergraduate program directors before students are enrolled in such courses.

The courses must be regular 5000-level computer science graduate courses, intended for computer science graduate majors.

5000-level Graduate Course	Satisfies BS Requirement
CEN 5011 Advanced Software Engineering	CEN 4010 Software Engineering
COP 5725 Principles of Database Management	COP 4540 Database
COP 5614 Operating Systems	COP 4610 Operating Systems
COT 5420 Theory of Computation I	MAD 3512 Algorithms
COT 5407 Introduction to Algorithms	Any Set 2 elective *
CEN 5120 Expert Systems	Any Set 1 elective *
CEN 5076 Software Testing	Any Set 1 elective *
COP 5577 Principles of Data Mining	Any Set 1 elective *
CAP 5602 Artificial Intelligence	Any Set 1 elective *
COP 5621 Compiler Construction	Any Set 1 elective *

* The courses in each elective set are defined in ../cs/info.php#CS Elective Course .

Minor in Computer Science

Required Courses

Students must take all of these courses:

COP 2210	Computer Programming I	COP 3337	Computer Programming II
COP 3402	Fundamentals of Computer Systems		

Elective Courses

Two courses must be selected from the following list:

CAP 4710	Principle Computer Graphics	COP 3530	Data Structures
CDA 4101	Structured Computer Organization	CGS 4854	Website Construction and Mgmt.
CNT 4513	Data Communications	COP 4338	Programming III
COP 3175	Programming in Visual Basic	COP 4540	Database Management

NOTE: Students from Engineering would choose COP 3530, and either COP 4338 or CDA 4101. Students from the School of Business would choose COP 3175 and CGS 4854. If one of the other options are selected, then the student should verify that he or she has the additional prerequisites necessary for the chosen course.

ALSO: Graduate courses can also be used to satisfy elective requirements. Please see advisor for approval. Graduate courses are subject to graduate fees.

Other Requirements

At least 9 of the 16 credits must be taken at F.I.U.

A grade of "C" or better must be obtained in all courses required for the minor.

NOTE: A "C-" is not an acceptable grade.

Bachelor of Arts in Information Technology

Second Major in Information Technology

The School of Computing and Information Sciences offers a Bachelor of Arts degree in Information Technology as a **second major**. This program is open to those students who are enrolled in and will be completing another Bachelor degree program or those who already have a Bachelor degree from an accredited institution. At this time Computer Science and Computer Engineering are not accepted as the primary major at this time.

Degree Requirements

Information Technology BA degree as a **second major** is intended to augment a student's primary degree.

As of the Fall 2010 semester, the requirements for the degree have changed. Courses that are marked with * are for students who declared the major before Fall 2010. Courses marked with + are for students who declare the major after the Summer 2010 semester. Courses marked with a * will only be offered as long as there are enough students to fill the classes. If you want to take these classes, take them as soon as possible.

Prerequisites

All students must have completed the following courses (or equivalent) prior to starting the BA in Information Technology program.

CGS 2518	Computer Data Analysis	COP 2250	Programming in Java
-or-			
CGS 2060	Intro to Microcomputers	CGS 3559	Using the Internet or equivalent
-or-			
CGS 2100	Intro to Micro for Business	MAD 1100	Math Concepts for IT

Core Courses

All students must complete all of the following courses:

CEN 3721+	Human Computer Interaction +	CGS 4366	Information Storage and Retrieval
CGS 3767	Computer Operating Systems	COP 3643*	Microcomputer Organization *
CGS 4285	Applied Computer Networking	COP 3804	Intermediate Java
CGS 4854	Web Site Construction and Mgmt		

Elective Courses

All students must complete **two** elective courses from the following list:

CIS 4431	IT Automation	COP 4655	Mobile Application Development
CNT 4403	Computer and Network Security	COP 4813	Web Application Programming
CNT 4504	Network Administration	COP 4814	Component Based Development
CNT 4513	Data Communications	COP 4722	DB Survey
COP 3348*	Intro to Using Unix/Linux *	COP 4723	DB Admin
COP 4005	Windows Programming for IT	CTS 4348	Unix Admin

Cognate Elective Courses

All students must complete **two additional elective courses**. Students who are completing their first major concurrent with their IT degree must choose their cognate elective courses from a list of designated courses from the department of their primary major, with the approval of an IT adviser. Students who have received their first BA degree prior to enrolling in the IT program must instead choose an additional two courses from the list of IT elective courses.

Bachelor of Arts in Information Technology Second Major/Degree in Information Technology

Prerequisites

CGS 2518
Data Analysis

CGS 3559
Introduction to
the Internet

COP 2250
Programming
in Java

MAD 1100
Math Concepts
for IT

Core

CEN 3721
Human Computer
Interaction
Pre: COP 2250

COP 3804
Intermediate
Java
Pre: COP 2250,
Co: CEN 3721

CGS 3767
Computer
Operating
Systems
Pre: COP 2250

CGS 4366
Information
Storage and
Retrieval
Pre: COP 3804

CGS 4854
Web Site
Const. and Mgmt.
Pre: COP3804,
CGS 3767

CGS 4285
Applied
Computer
Networking
Pre: CGS 3767

Electives

COP 4723
DB
Administration
Pre: CGS 4366

COP 4814
Component-
Based Soft.
Pre: CGS 4854,
CGS 4366

COP 4005
Windows
Prgm'g for IT
Pre: COP 3804
Co: CGS 4366

CNT 4403
Computing and
Net. Security
Pre: COP 3804,
CGS 3767

CNT 4513
Data
Comm.
Pre: COP 3804,
CGS 4285

CIS 4431
IT
Automation
Co: CGS 4285

CTS 4348
Unix System
Admin
Pre: CGS 3767

COP 4722
Survey of DB
Systems
Pre: CGS 4366

COP 4655
Mobile Appl.
Prgm'g
Pre: COP 4814

COP 4813
Web
Appl. Prgm'g
Pre: CGS 4854,
COP 4005

CNT 4405
Advanced
Network Mgmt.
Pre: CNT 4513

Twelve credits of electives must be taken by all students. For those who are pursuing two majors at the same time, the electives can be split between IT electives and approved cognate electives. All other students must take twelve credits of IT electives.

IT Electives

Choose from the
above list of electives.

Cognate Electives

For students pursuing two majors at the same time, a cognate elective is a course from the other major that is related to IT. If there are suitable courses that are required for the other major, they can replace up to six credits of IT electives. All cognate classes must be approved by advisers from both majors.

Pre: indicates a prerequisite. The prerequisite must be completed before the current course.

All courses are 3 credits,
except as noted

Co: indicates a co-requisite. The co-requisite may be taken at the same time as or before the current course. The co-requisite is a prerequisite for any course that has the current course as a prerequisite.

Effective 08/2010

Bachelor of Arts in Information Technology Second Major/Degree in Information Technology

For students who declared the BA in IT before Fall 2010.

Prerequisites

CGS 2518
Data Analysis

CGS 3559
Introduction to
the Internet

COP 2250
Programming
in Java

MAD 1100
Math Concepts
for IT

Core

COP 3643
Computer
Organization
Pre: COP 2250

COP 3804
Intermediate
Java
Pre: COP 2250

CGS 3767
Computer
Operating
Systems
Pre: COP 2250

CGS 4366
Information
Storage and
Retrieval
Pre: COP 3804

CGS 4854
Web Site
Const. and Mgmt.
Pre: COP3804,
CGS 3559

CGS 4285
Applied
Computer
Networking
Pre: CGS 3767

Electives

COP 4723
DB
Administration
Pre: CGS 4366

COP 4814
Component-
Based Soft.
Pre: CGS 4854,
CGS 4366

COP 4005
Windows
Prgm'g for IT
Pre: COP 3804
Co: CGS 4366

CNT 4403
Computing and
Net. Security
Pre: COP 3804,
CGS 3767

CNT 4513
Data
Comm.
Pre: COP 3804,
CGS 4285

CIS 4431
IT
Automation
Co: CGS 4285

COP 3348
Unix System
Admin
Pre: CGS 3767

COP 4722
Survey of DB
Systems
Pre: CGS 4366

COP 4655
Mobile Appl.
Prgm'g
Pre: COP 4814

COP 4813
Web
Appl. Prgm'g
Pre: CGS 4854,
COP 4005

CNT 4405
Advanced
Network Mgmt.
Pre: CNT 4513

CTS 4348
Unix System
Admin
Pre: COP 3348

Twelve credits of electives must be taken by all students. For those who are pursuing two majors at the same time, the electives can be split between IT electives and approved cognate electives. All other students must take twelve credits of IT electives.

IT Electives

Choose from the
above list of electives.

Cognate Electives

For students pursuing two majors at the same time, a cognate elective is a course from the other major that is related to IT. If there are suitable courses that are required for the other major, they can replace up to six credits of IT electives. All cognate classes must be approved by advisers from both majors.

Pre: indicates a prerequisite. The prerequisite must be completed before the current course.

All courses are 3 credits,
except as noted

Co: indicates a co-requisite. The co-requisite may be taken at the same time as or before the current course. The co-requisite is a prerequisite for any course that has the current course as a prerequisite.

Effective 08/2004

Bachelor of Arts in Information Technology

Second Major in Information Technology

Plan of Study

As of the Fall 2010 semester, the requirements for the degree have changed. Courses that are marked with * are for students who declared the major before Fall 2010. Courses marked with + are for students who declare the major after the Summer 2010 semester. Courses marked with a * will only be offered as long as there are enough students to fill the classes. If you want to take these classes, take them as soon as possible.

Freshman Year - 30 Credits

MAD 1100 - Math Concepts for IT (3 credits)
CGS 2060 - Introduction to Computers (3 credits)
UCC courses (15 credits)
General Electives (9 credits)

Sophomore Year - 30 credits

COP 2250 - Programming in Java (3 credits)
CGS 3559 - Using the Internet (1 credit)
UCC courses (18 credits)
General Electives (8 credits)

Junior Year - 30 credits

CEN 3721+ - Human Computer Interaction + (3 credits)
COP 3804 - Intermediate Java (3 credits)
CGS 3767 - Computer Operating Systems (3 credits)
COP 3643* - Microcomputer Organization * (3 credits)
CGS 4285 - Applied Computer Networking (3 credits)
CGS 4366 - Info Storage and Retrieval (3 credits)
CGS 4854 - Website Construction and Management (3 credits)
First Major Courses and General Electives (12 credits)

Senior Year - 30 credits

2 IT Electives (6 credits)
2 Cognate Electives (6 credits)
First Major Courses and General Electives (18 credits)

For students who are deficient in a foreign language, the general electives should include a two-semester sequence in one foreign language.

Students are required to earn at least nine credit hours prior to graduation by attending one or more summer semesters at FIU or any other University in the Florida State system.

Bachelor of Science in Information Technology

Information Technology Major

The School of Computing and Information Sciences offers a Bachelor of Science degree in Information Technology as a **single major**.

As of the Fall 2010 semester, the requirements for the degree have changed. Courses that are marked with * are for students who declared the major before Fall 2010. Courses marked with + are for students who declare the major after the Summer 2010 semester. Courses marked with a * will only be offered as long as there are enough students to fill the classes. If you want to take these classes, take them as soon as possible.

Prerequisites

All students must have completed the following courses (or equivalent) prior to starting the BS in Information Technology program.

CGS 2518	Computer Data Analysis	MAC 2147	Pre-calculus Mathematics
-or-		-or-	
CGS 2060	Intro to Microcomputers	MAC 1105	Algebra and MAC 1114 Trig
-or-			
CGS 2100	Intro to Micro for Business	MAD 1100	Math Concepts for IT
COP 2250	Programming in Java	PSY 2012	Introductory Psychology
CGS 3092	Prof. Ethics and Social Issues		

Interdisciplinary Credits

Nine credits must be taken outside SCIS. These credits must be selected from the courses for a minor or certificate in another discipline. All nine credits must be taken from the same minor or certificate.

Students graduating under the requirements in effect prior to Fall 2010 must take additional courses and complete a minor (not a certificate).

Core Courses

All students must complete all of the following courses:

CEN 3721+	Human Computer Interaction +	CNT 4403+	Computing and Network Security +
CGS 1920	Introduction to Computing	COP 3643*	Microcomputer Organization *
CGS 3767	Computer Operating Systems	COP 3804	Intermediate Java
CGS 4285	Applied Computer Networking	COP 4814+	Component-Based Software Dev. +
CGS 4854	Web Site Construction and Mgmt.	ENC 3213	Professional & Technical Writing
CGS 4366	Info Storage and Retrieval		

Elective Courses

Students must take 5 elective courses. Select two areas of concentration and take at least two courses in those two selected areas (4 courses). The fifth course may be selected from any area of concentration.

System Administration Area

COP 3348*	Intro to Unix/Linux *	CIS 4431	IT Automation
CTS 4348	Unix Admin		

Network Administration Area

CNT 4504	Network Administration	CNT 4513	Data Communications
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Application Development Area

COP 4005	Windows Programming for IT	COP 4813	Web Application Programming
COP 4655	Mobile Application Development		

Database Administration Area

COP 4722	DB Survey	COP 4723	DB Admin
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Free Electives

All students must complete additional general elective courses to reach a minimum of 120 total credits. Prerequisites can count as general electives.

Bachelor of Science in Information Technology

Information Technology Major

Prerequisites and Core

CGS 1920
Introduction
To Computing
(1 credit)

CGS 2518
Data Analysis

PSY 2012
Introductory
Psychology

COP 2250
Programming
in Java

MAD 1100
Math Concepts
for IT

MAC 2147
Pre-Calculus

CEN 3721
Human Computer
Interaction
Pre: COP 2250

COP 3804
Intermediate Java
Pre: COP 2250
Co: CEN 3721

CGS 3767
Computer Operating
Systems
Pre: COP 2250

ENC 3213*
Technical
Writing

CGS 4366
Information Storage
and Retrieval
Pre: COP 3804

CGS 4854
Web Site Construct.
and Mgmt.
Pre: COP 3804,
CGS 3767

CGS 4285
Applied Computer
Networking
Pre: CGS 3767

CGS 3092
Ethics/Soc.In
Computing (1 cr)
Pre: COP 2250,
ENC 3213

COP 4814
Component-Based
Software Dev.
Pre: CGS 4366,
CGS 4854

CNT 4403
Computing and
Network Security
Pre: COP 3804,
CGS 4285

Electives

COP 4723
DB Admin.
Pre: CGS 4366

COP 4005
Windows
Prgm'g for IT
Pre: COP 3804
Co: CGS 4366

COP 4655
Mobile Appl.
Prgm'g
Pre: COP 4814

CTS 4348
Unix System
Admin.
Pre: CGS 3767

CNT 4513
Data
Comm.
Pre: COP 3804,
CGS 4285

COP 4722
Survey of DB
System
Pre: CGS 4366

COP 4813
Web Appl.
Prgm'g
Pre: COP 4005,
CGS 4854

CIS 4431
IT
Automation
Pre: CGS 4285

CNT 4504
Advanced
Network Mgmt.
CNT 4513

Database
Administration

Application Development

System
Administration

Network
Administration

There are four elective areas: database administration, network administration, system administration, application development. Fifteen credits of electives are required: six credits each must be taken in two areas; the remaining three credits can be taken in any area. With prior approval of an adviser, the fifth elective can be met with a coop or internship.

Interdisciplinary Credits

Nine additional credits must be taken outside SCIS. These credits must be selected from the courses for a minor or certificate in another discipline. All nine credits must be taken from the same minor or certificate.

Pre: indicates a prerequisite. The prerequisite must be completed before the current course.

All courses are 3 credits, except as noted

Co: indicates a co-requisite. The co-requisite may be taken at the same time as or before the current course. The co-requisite is a prerequisite for any course that has the current course as a prerequisite.

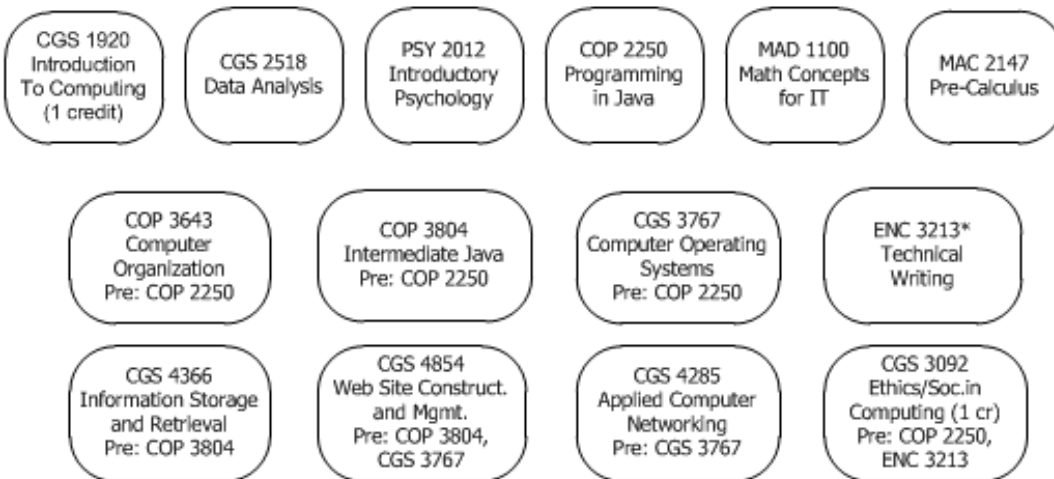
* ENC 3213 prerequisites: complete the UCC English requirements

Bachelor of Science in Information Technology

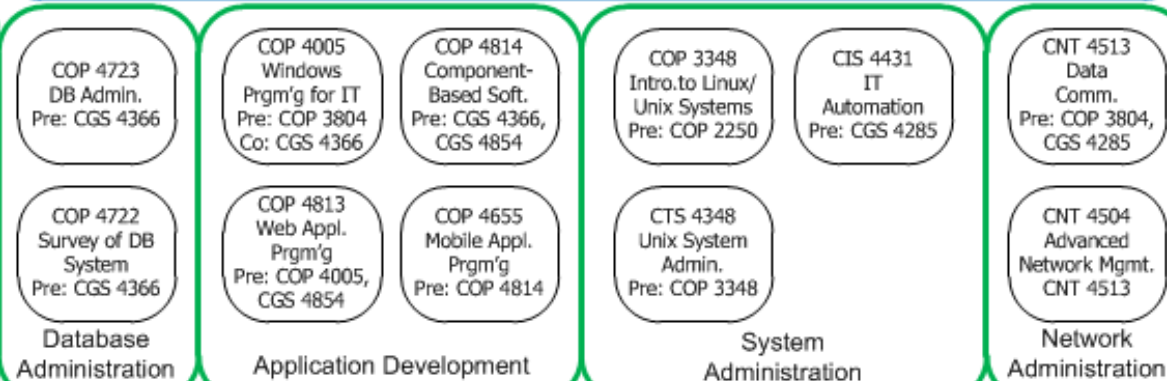
Information Technology Major

For students who declared the BS in IT before Fall 2010.

Prerequisites and Core



Electives



There are four elective areas: database administration, network administration, system administration, application development. Fifteen credits of electives are required: six credits each must be taken in two areas; the remaining three credits can be taken in any area. With prior approval of an adviser, the fifth elective can be met with a coop or internship.

Minor in Another Discipline

Students must earn a minor in another discipline, outside of SCIS. Speak to an adviser in the minor area to declare the minor and learn which courses are required.

Pre: indicates a prerequisite. The prerequisite must be completed before the current course.

All courses are 3 credits, except as noted

Co: indicates a co-requisite. The co-requisite may be taken at the same time as or before the current course. The co-requisite is a prerequisite for any course that has the current course as a prerequisite.

* ENC 3213 prerequisites: complete the UCC English requirements

Effective 08/2010

Bachelor of Science in Information Technology

Information Technology Major

Plan of Study

As of the Fall 2010 semester, the requirements for the degree have changed. Courses that are marked with * are for students who declared the major before Fall 2010. Courses marked with + are for students who declare the major after the Summer 2010 semester. Courses marked with a * will only be offered as long as there are enough students to fill the classes. If you want to take these classes, take them as soon as possible.

Freshman Year - 30 Credits

CGS 1920 - Introduction to Computing (1 credit)
MAC 2147 - Pre-calculus (4 credits)
CGS 2060 - Introduction to Computers (3 credits)
PSY 2012 - Introductory Psychology (3 credits)
UCC courses (12 credits)
General Electives (7 credits)

Sophomore Year - 30 credits

MAD 1100 - Math Concepts for IT (3 credits)
COP 2250 - Programming in Java (3 credits)
UCC courses (16 credits)
General Electives (8 credits)

Junior Year - 30 credits

CEN 3721+ - Human Computer Interaction + (3 credits)
COP 3804 - Intermediate Java (3 credits)
COP 3643* - Microcomputer Organization * (3 credits)
CGS 3767 - Computer Operating Systems (3 credits)
ENC 3213 - Professional and Technical Writing (3 credits)
CGS 4285 - Applied Computer Networking (3 credits)
CGS 4366 - Information Storage and Retrieval (3 credits)
CGS 4854 - Website Construction and Management (3 credits)
CGS 3092 - Professional Ethics and Social Issues in Computing (1 credit)
IT Electives (6 credits)
General Electives (2 credits)

Senior Year - 30 credits

COP 4814+ - Component-Based Software Development + (3 credits)
CNT 4403+ - Computing and Network Security + (3 credits)
IT Electives (9 credits)
Interdisciplinary Courses + (9 credits)
Minor Courses * (15 credits)
General Electives (6 credits)

For students who are deficient in a foreign language, the general electives should include a two-semester sequence in one foreign language.

Students are required to earn at least nine credit hours prior to graduation by attending one or more summer semesters at FIU or any other University in the Florida State system.

Bachelor of Science in Information Technology

Software Major

The School of Computing and Information Sciences offers a Bachelor of Science degree in Information Technology as a single major with a strong foundation in the theory of Computer Science.

Prerequisites

All students must have completed the following courses (or equivalent) prior to starting the BS in Information Technology program.

CGS 2518	Computer Data Analysis	MAC 2147	Pre-calculus Mathematics
-or-		-or-	
CGS 2060	Intro to Microcomputers	MAC 1105	Algebra and MAC 1114 Trig
-or-			
CGS 2100	Intro to Micro for Business	MAD 2104	Discrete Math
COP 2210	Programming I	PSY 2012	Introductory Psychology
CGS 3092	Prof. Ethics and Social Issues		

Interdisciplinary Credits

Nine credits must be taken outside SCIS. These credits must be selected from the courses for a minor or certificate in another discipline. All nine credits must be taken from the same minor or certificate.

Core Courses

All students must complete all of the following courses:

CEN 3721	Human Computer Interaction	COP 3337	Programming II
CGS 1920	Introduction to Computing	COP 3402	Fundamentals of Computer Sys.
CGS 3767	Computer Operating Systems	COP 3530	Data Structures
CGS 4285	Applied Computer Networking	COP 4338	Programming III
CGS 4854	Web Site Construction and Mgmt.	COP 4814	Component-Based Software Dev.
CGS 4366	Info Storage and Retrieval	ENC 3213	Professional & Technical Writing
CNT 4403	Computing and Network Security		

Elective Courses

All students must take two elective courses. Students must select one area of concentration and take two courses in that area.

System Administration Area

CTS 4348	Unix Admin	CIS 4431	IT Automation
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Network Administration Area

CNT 4504	Network Administration	CNT 4513	Data Communications
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Application Development Area

COP 4005	Windows Programming for IT	COP 4655	Mobile Application Development
COP 4813	Web Application Programming		

Database Administration Area

COP 4722	DB Survey	COP 4723	DB Admin
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Free Electives

All students must complete additional general elective courses to reach a minimum of 120 total credits. Prerequisites can count as general electives.

Bachelor of Science in Information Technology Software Major

Prerequisites and Core

CGS 1920 Introduction To Computing (1 credit)	CGS 2518 Data Analysis	PSY 2012 Introductory Psychology	COP 2210 Programming I	MAD 2104 Discrete Math	MAC 2147 Pre-Calculus
COP 3402 Fundamentals of Computer Systems Pre: COP 2250	CEN 3721 Human Computer Interaction Pre: COP 2250	COP 3337 Programming II Pre: COP 2210	CGS 3767 Computer Operating Systems Pre: COP 2250	ENC 3213* Technical Writing	
COP 3530 Data Structures Pre: COP 3337, MAD 2104	CGS 4366 Information Storage and Retrieval Pre: COP 3804	CGS 4854 Web Site Construct. and Mgmt. Pre: COP 3804, CGS 3767	CGS 4285 Applied Computer Networking Pre: CGS 3767	CGS 3092 Ethics/Soc.in Computing (1 cr) Pre: COP 2250, ENC 3213	
COP 4338 Programming III Pre: COP 3530	COP 4814 Component-Based Software Dev. Pre: CGS 4366, CGS 4854	CNT 4403 Computing and Network Security Pre: COP 3804, CGS 4285			

Electives

COP 4723 DB Admin. Pre: CGS 4366	COP 4005 Windows Prgm'g for IT Pre: COP 3804 Co: CGS 4366	COP 4655 Mobile Appl. Prgm'g Pre: COP 4814	CTS 4348 Unix System Admin. Pre: CGS 3767	CNT 4513 Data Comm. Pre: COP 3804, CGS 4285
COP 4722 Survey of DB System Pre: CGS 4366	COP 4813 Web Appl. Prgm'g Pre: COP 4005, CGS 4854		CIS 4431 IT Automation Pre: CGS 4285	CNT 4504 Advanced Network Mgmt. CNT 4513
Database Administration	Application Development		System Administration	Network Administration

There are four areas of concentration: database administration, network administration, system administration, application development. Six credits of electives are required in one area of concentration.

Interdisciplinary Credits

Nine additional credits must be taken outside SCIS. These credits must be selected from the courses for a minor or certificate in another discipline. All nine credits must be taken from the same minor or certificate.

Pre: indicates a prerequisite. The prerequisite must be completed before the current course.

All courses are 3 credits, except as noted

Co: indicates a co-requisite. The co-requisite may be taken at the same time as or before the current course. The co-requisite is a prerequisite for any course that has the current course as a prerequisite.

* ENC 3213 prerequisites: complete the UCC English requirements

Effective 08/2010

Bachelor of Science in Information Technology

Software Major

Plan of Study

Freshman Year - 30 Credits

CGS 1920 - Introduction to Computing (1 credit)
MAC 2147 - Pre-calculus (4 credits)
CGS 2518 - Data Analysis (3 credits)
PSY 2012 - Introductory Psychology (3 credits)
UCC courses (12 credits)
General Electives (7 credits)

Sophomore Year - 30 credits

MAD 2104 - Discrete Math (3 credits)
COP 2210 - Programming I (4 credits)
UCC courses (16 credits)
General Electives (7 credits)

Junior Year - 30 credits

CEN 3721 - Human Computer Interaction (3 credits)
COP 3337 - Programming II (3 credits)
CGS 3767 - Computer Operating Systems (3 credits)
ENC 3213 - Professional and Technical Writing (3 credits)
CGS 4285 - Applied Computer Networking (3 credits)
CGS 4366 - Information Storage and Retrieval (3 credits)
CGS 4854 - Website Construction and Management (3 credits)
COP 3402 - Fundamentals of Computer Systems (3 credits)
IT Electives (3 credits)
Interdisciplinary Courses (3 credits)

Senior Year - 30 credits

CGS 3092 - Professional Ethics and Social Issues in Computing (1 credit)
COP 4814 - Component-Based Software Development (3 credits)
CNT 4403 - Computing and Network Security (3 credits)
COP 3530 - Data Structures (3 credits)
COP 4338 - Programming III (3 credits)
IT Electives (3 credits)
Interdisciplinary Courses (6 credits)
General Electives (8 credits)

For students who are deficient in a foreign language, the general electives should include a two-semester sequence in one foreign language.

Students are required to earn at least nine credit hours prior to graduation by attending one or more summer semesters at FIU or any other University in the Florida State system.

Undergraduate Course Offerings

Definition of Prefixes CAP-Computer Applications; CDA-Computer Design/Architecture; CEN-Computer Software Engineering; CGS-Computer General Studies; CIS-Computer Information Systems; CNT-Computer Networks; COP-Computer Programming; COT-Computing Theory; CTS-Computer Technology and Skills

CAP 4710 Principles of Computer Graphics (3). A first course in algorithms/techniques for image generation devices, geometric transformations/matrices, algorithms for hidden surfaces, ray tracing, advanced rendering. Programming with standard graphics interface. Prerequisites: COP 3337 and MAC 2312. This course will have additional fees.

CAP 4770 Introduction to Data Mining (3). Data mining applications, data preparation, data reduction and various data mining techniques such as association, clustering, classification, anomaly detection. Prerequisite: COP 3530. Corequisite: COP 4540.

CDA 4101 Structured Computer Organization (3). Covers the levels of organization in a computer: Design of memory, buses, ALU, CPU; design of microprogram. Covers virtual memory, I/O, multiple processes, CISC, RISC and parallel architectures. Prerequisites: MAD 2104, COP 3402 and COP 3337. This course will have additional fees.

CDA 4400 Computer Hardware Analysis (3). The study of storage hardware functions of a basic computer. Topics include logic elements, arithmetic logic units, control units, memory devices, organization and I/O devices. Prerequisite: CDA 4101.

CEN 3721 Introduction to Human Computer Interaction (3). Fundamental concepts of human-computer interaction, cognitive models, user-centered design principles and evaluation, emerging technologies. Prerequisites: COP 2250 or equivalent. This course will have additional fees.

CEN 4010 Software Engineering I (3). Software Process Model, software analysis and specification, software design, testing. Prerequisites: COM 3110, CGS 3092 and COP 3530. This course will have additional fees.

CEN 4012 Software Design and Development Project (3). Students design, implement, document, and test software systems working in faculty supervised project teams and utilizing knowledge obtained in previous courses. Required for Software Design and Development track. Prerequisite: CEN 4010. This course will have additional fees.

CEN 4021 Software Engineering II (3). Issues underlying the successful development of large scale software projects: Software Architectures; Software Planning and Management; Team Structures; Cost Estimation. Prerequisite: CEN 4010. This course will have additional fees.

CEN 4072 Fundamentals of Software Testing (3). Fundamentals of software testing. Topics include: test plan creation, test case generation, program inspections, specification-based and implementation-based testing, GUI testing, and testing tools. Prerequisite: COP 3530.

CGS 1920 Introduction to Computing (1). Overview of the computing field to students, research programs and career options.

CGS 2060 Introduction to Microcomputers (3). A hands-on study of microcomputer software packages for applications such as operating system, word processing, spreadsheets, and database management. For students without a technical background. Not acceptable for credit for Computer Science majors.

CGS 2100 Intro to Microcomputer Applications for Business (3). A hands-on study of spreadsheet and database management packages for business students without a technical background. Not acceptable for credit for Computer Science majors.

CGS 2423 C for Engineers (3). A first course in programming geared for engineering and natural science students that describes the syntax and semantics of ANSI C programming language. Includes developing algorithms and writing for problems in engineering and science.

CGS 2518 Computer Data Analysis (3). A hands-on study of how to use a modern spreadsheet program to analyze data, including how to perform queries, summarize data, and solve equations. For non-technical students. Not acceptable for CS students.

CGS 3092 Professional Ethics and Social Issues in Computing (1). Ethical, legal, social issues and the responsibility of computer professionals. Codes of conduct, risks and reliability, responsibility, liability, privacy, security, free speech issues. Prerequisite: ENC 3213 and (COP 2210 or COP 2250).

CGS 3416 Web-based Programming (3). A programming course in Java with emphasis on web-based applications: Applets; Components; Servlets; Java Beans. Not acceptable for credit for Computer Science majors. Prerequisites: COP 2250 and MAD 1100. This course will have additional fees.

CGS 3559 Using the Internet (1). Internet history and importance. What is available on the Net. Tools such as email, listserves, telnet, ftp, Archie, Veronica, Gopher, netfind, the World Wide Web, Wais, and Mosaic. Nontechnical. Prerequisite: CGS 2060 or equivalent.

CGS 3767 Computer Operating Systems (3). Introduction to fundamental concepts of operating systems and their implementation in UNIX and Windows. Prerequisites: COP-2250 OR COP-2210

CGS 4285 Applied Computer Network (3). Principles of computer network design, operation and management. Network protocols. Network configuration. Network security. Not acceptable for credit for Computer Science majors. Prerequisite: CGS 3767. This course will have additional fees.

CGS 4365 Knowledge-Based Management Systems (3). Introduction to knowledge-based and expert systems. Knowledge acquisition, knowledge representation, and creation of expert system. Not acceptable for credit for Computer Science majors. Prerequisite: CGS 4366. This course will have additional fees.

CGS 4366 Information Storage and Retrieval Concepts (3). Introduction to information management and retrieval concepts. The design and implementation of a relational database using a commercial DBMS. Online information retrieval and manipulation. Not acceptable for credit for Computer Science majors. Prerequisite: COP 3804. This course will have additional fees.

CGS 4854 Website Construction and Management (3). The fundamentals of creating and maintaining a website. Installation and maintenance of a web-server. Techniques for building multimedia interactive web-pages. Not acceptable for credit for Computer Science majors. Prerequisites: CGS 3767 and (COP 3804 or COP 3337). This course will have additional fees.

CIS 3900 Independent Study (1-5). Individual conferences, assigned readings, and reports on independent investigations.

CIS 3930 Special Topics (1-5). A course designed to give groups of students an opportunity to pursue special studies not otherwise offered.

CIS 4431 IT Automation (3). IT automation: mgmt models, auditing, assets, change mgmt, network monitoring, OS imaging, patch mgmt, help desk, remote control, user state mgmt, end-point security, backup, disaster recovery. Corequisite: CGS 4285 or permission of the instructor.

CIS 4905 Independent Study (1-20). Individual conferences, assigned readings, and reports on independent investigations.

CIS 4911 Senior Project (3). Students work on faculty supervised projects in teams of up to 5 members to design and implement solutions to problems utilizing knowledge obtained across the spectrum of Computer Science courses. Prerequisite: Permission of the instructor.

CIS 4912 Research Experience for Undergraduate Students (0-9). Participation in ongoing research in the research centers of the school.

CNT 4403 Computing and Network Security (3). Fundamental concepts and principles of computing and network security, symmetric and asymmetric cryptography, hash functions, authentication, firewalls and intrusion detection, and operational issues. Prerequisites: CGS-4285 and COP 3804

CNT 4504 Advanced Network Management (3). Advanced principles of modern internetworking network design and implementation. Hands on experience with routers and switches and core Internet support protocols. Prerequisites: CNT 45513

CNT 4513 Data Communications (3). Fundamental concepts and principles of computing and network security, symmetric and asymmetric cryptography, hash functions, authentication, firewalls and intrusion detection, and operational issues. Prerequisites: CGS 4285 and COP 3804.

COP 1000 Introduction to Computer Programming (3). Uses graphics and animation in a media programming environment to engage students with no programming experience. Students develop problem solving skills and learn fundamental programming concepts.

COP 2210 Computer Programming I (4). A first course in computer science that uses a structured programming language to study programming and problem solving on the computer. Includes the design, construction and analysis of programs. Student participation in a closed instructional lab is required. This course will have additional fees.

COP 2250 Programming in Java (3). A first course in programming for IT majors. Syntax and semantics of Java. Classes and Objects. Object oriented program development. Not acceptable for credit for Computer Science majors. This course will have additional fees.

COP 3175 Programming in Visual Basic (3). An introduction to Visual Basic programming with emphasis on Business Applications. Not acceptable for credit for Computer Science majors. Prerequisites: CGS 2100 or CGS 2060. This course will have additional fees.

COP 3337 Computer Programming II (3). An intermediate level course in Object Oriented programming. Topics include primitive types, control structures, strings arrays, objects and classes, data abstraction inheritance polymorphism and an introduction to data structures. Prerequisite: COP 2210 or EEL 2880. This course will have additional fees.

COP 3348 Introduction to Using Unix/Linux Systems (3). Techniques of Unix/Linux systems. Basic use, file system structure, process system structure, unix tools (regular expressions, grep, find), simple and complex shell scripts, Xwindows. Not acceptable for credit for Computer Science majors. Prerequisites: COP 2210 or COP 2250 or equivalent. This course will have additional fees.

COP 3402 Fundamentals of Computer Systems (3). Overview of computer systems organization. Data representation. Machine and assembly language programming. Prerequisites: COP 2210 or equivalent. This course will have additional fees.

COP 3465 Data Structures for IT (3). Basic concepts of running time of a program, data structures including lists, stacks, queues, binary search trees, and hash tables, and internal sorting. Not acceptable for credit for CS majors. Prerequisite: Programming II (IT). This course will have additional fees.

COP 3530 Data Structures (3). Basic concepts of data organization, running time of a program, abstract types, data structures including linked lists, nary trees, sets and graphs, internal sorting. Prerequisites: MAD 2104 and COP 3337. This course will have additional fees.

COP 3643 Microcomputer Organization (3). A study of the hardware components of modern microcomputers and their organization. Evaluation and comparison of the various microcomputer systems. Not acceptable for credit for Computer Science Majors. Prerequisite: COP 2250. This course will have additional fees.

COP 3804 Intermediate Java Programming (3). A second course in Java programming. Continues Programming in Java by discussing object-oriented programming in a more detail, with larger programming projects and emphasis on inheritance. Not acceptable for credit for CS majors. Prerequisite: COP 2250. Corequisite: CEN 3721. This course will have additional fees.

COP 3832 Advanced Web Server Communication (3). Maintain a web server on the Internet. Learn HTML, PERL, Javascript. Configure the Apache web server. Write interactive server scripts. Discuss Web security & ASP. Use Java applets and ActiveX controls. Prerequisites: CGS 3559, COP 2210 or equivalents. This course will have additional fees.

COP 3835 Designing Web Pages (3). Designing basic pages for display on the World Wide Web. Fundamental design elements and contemporary design tools are discussed. Computer literacy is expected..

COP 3949 Cooperative Education in Computer Science (1-3). One semester of full-time work, or equivalent, in an outside organization, limited to students admitted to the CO-OP program. A written report and supervisor evaluation is required of each student. Prerequisites: MAC 2312 and COP 3337.

COP 4005 Windows Programming for IT Majors (3). Application development techniques in Windows: Visual Basic Classes, Objects, Controls, Forms and Dialogs, Database, Active X and Internet Programming and Enterprise Application Architecture. Not acceptable for credit for CS Majors. Prerequisite: COP 3804 or COP 3337. Corequisite: CGS 4366. This course will have additional fees.

COP 4009 Windows Components Technology (3). Component-Based and Distributed Programming Techniques: C#, Common Type System, Windows and Web Forms, Multithreading, Distributed Objects. Prerequisites: COP 4226 or COP 4005. This course will have additional fees.

COP 4225 Advanced Unix Programming (3). Unix overview: files and directories, shell scripting and systems programming. Unix tools; Internals: file systems, process structure. Using the system call interface. Interprocess communication. Prerequisite: COP 4338. Corequisite: COP 4610. This course will have additional fees.

COP 4226 Advanced Windows Programming (3). Document and Dialog Based App, Message Passing, Printing, Drawing, GUI Design, Common Controls, Multithreaded Programming, Serialization, Database Connectivity, Runtime Libraries, Memory Management. Prerequisite: COP 3530. This course will have additional fees.

COP 4338 Computer Programming III (3). Topics include Object-Oriented programming Concepts and Modern Programming Techniques. Prerequisite: COP 3530. This course will have additional fees.

COP 4520 Introduction to Parallel Computing (3). This course introduces the field of parallel computing. The students will be taught how to design efficient parallel programs and how to use parallel computing techniques to solve scientific problems. Prerequisites: COP 3530 and (CDA 4101 or EEL 4709C). .

COP 4540 Database Management (3). Logical aspects of databases including Relational, Entity-Relationship, and Object-Oriented data models, database design, SQL, relational algebra, tuple calculus, domain calculus, and physical database organization. Prerequisite: COP 3530. This course will have additional fees.

COP 4555 Principles of Programming Languages (3). A comparative study of several programming languages and paradigms. Emphasis is given to design, evaluation and implementation. Programs are written in a few of the languages. Prerequisite: COP 3530. This course will have additional fees.

COP 4610 Operating Systems Principles (3). Operating systems design principles and implementation techniques. Address spaces, system call interface, process/threads, interprocess communication, deadlock, scheduling, memory, virtual memory, I/O, file systems. Prerequisites: CDA 4101 and COP 4338. This course will have additional fees.

COP 4655 Mobile Application Development (3). Design and development of mobile applications. Introduction to the mobile application frameworks, including user interface, sensors, event handling, data management and network interface. Prerequisite: COP 4814

COP 4722 Survey of Database Systems (3). Design and management of enterprise systems; concurrency techniques; distributed, object-oriented, spatial, and multimedia databases; databases integration; datawarehousing and datamining; OLAP; XML interchange. Prerequisites: CGS 4366 or COP 4540.

COP 4723 Database Administration (3). Client-server architecture; planning, installation, server configuration; user management; performance optimization; backup, restoration; security configuration; replication management; administrative tasks. Prerequisites: CGS 4366 or COP 4540.

COP 4813 Web Application Programming (3). Creating Web applications with user interfaces, databases, state management, user authentication, error handling, and web services. Prerequisites: CGS 4854 and COP 4005.

COP 4814 Component-Based Software Development (3). Concept of software components, component models and web services such as WSDL and SOAP. Prerequisites: CGS 4366 AND CGS 4854.

COP 4906 Research Experiences in Computer Science (1-3). Participation in ongoing research in the research centers of the school. Prerequisite: Permission of the instructor.

COP 4949 Cooperative Education in Computer Science (1-3). One semester of full-time work, or equivalent, in an outside organization, limited to students admitted to the CO-OP program. A written report and supervisor evaluation is required of each student. Prerequisites: MAC 2312, STA 3033 and COP 3337.

COT 3420 Logic for Computer Science (3). An introduction to the logical concepts and computational aspects of propositional and predicate logic, as well as to concepts and techniques underlying logic programming, in particular, the computer language Prolog. Prerequisites: COP 3337 and MAD 2104. This course will have additional fees.

CTS 2327 Microsoft Windows NT Administration (3). A two-part course covering introduction to Networking and the Windows NT Operating System. This course will cover material that is covered on the Microsoft Certified systems Engineer (MCSE) exam. Prerequisites: CGS 2060, or CGS 2100, or equivalent. This course will have additional fees.

CTS 4348 Unix System Administration (3). Techniques of Unix system administration: system configuration and management; user setup, management and accounting; software installation and configuration; network setup, configuration and management. Prerequisite: COP 3348.

Faculty and Research Interests

JAINENDRA NAVLAKHA	Director; Professor, Ph.D., Case Western Reserve 1977. Analysis of algorithms program verification software metrics.
MARK WEISS	Associate Director; Professor, Ph.D., Princeton, 1987. Data Structures and Algorithm Analysis.
WALID AKACHE	Instructor, M.S. Miami 1984. Computer Science.
DAVID BARTON	Professor, Ph.D., Cambridge 1966. Distributed systems and data communications.
TOBY BERK	Professor Emeritus, Ph.D., Purdue, 1972. Computer graphics and operating systems.
SHU-CHING CHEN	Associate Professor, Ph.D., Purdue University, West Lafayette, Indiana 1998. Electrical and Computer Engineering.
PETER CLARKE	Assistant Professor, Ph.D., Clemson University 2003. Software Engineering, Software Testing, Software Maintenance, and Programming Languages.
TIM DOWNEY	Instructor, M.S., SUNY Albany 1986. Computer Science.
XUDONG HE	Professor, Ph.D., Virginia Polytechnic Institute & State University, 1989. Computer Science.
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