The University of Tampa's Minor in Computer Science

The University of Tampa's minor in computer science is designed for students who wish to broaden their knowledge and supplement their undergraduate degree with coursework that develops an understanding of computer science fundamentals and practical computing skills useful in many disciplines. It is designed for students who wish to pursue a graduate degree in computer science or simply to add a secondary field to their major area.

Curriculum

The computer science minor curriculum is a total of 24 credit hours. It includes a set of core courses that provide a foundation in computer science. The core is composed of 5 courses totaling 20 credit hours:

Course	Title	Credit Hours
CSC 101	The Science of Computing I	4
CSC 102	The Science of Computing II	4
CSC 201	Data Structures and Algorithm Analysis	4
CSC 230	Software Design and Engineering	4
CSC 301	Advanced Data Structures and Algorithms	4
TOTAL		**20**

The computer science minor also requires one computer science course at the 300- or 400-level to provide additional depth in computer science. The following courses satisfy this requirement:

Course	Title	Credit Hours
CSC 310	Ethics and Impact of Computing (W)	4
CSC 320	Theory of Computation	4
CSC 330	Introduction to Computer Network Security	4
CSC 340	Database Management Systems	4
CSC 350	Web Programming and Development	4
CSC 410	Artificial Intelligence and Machine Learning	4
CSC 420	Programming Languages and Compilers	4

Note that as new faculty are hired and more students enroll in the program, we expect elective topics to increase as needed.

Typically, it should take a student five semesters to complete the minor.

Schedule of Courses Offerings

A majority of the program's core courses are offered throughout the academic year (i.e., during both the fall and spring semesters). Typically, electives are offered once per year. The table below shows when courses are typically offered:

Course	Title	Credit Hours	Fall	Spring
	CORE			
CSC 101	The Science of Computing I	4	✓	✓
CSC 102	The Science of Computing II	4	✓	✓
CSC 201	Data Structures and Algorithm Analysis	4	✓	✓
CSC 210	Computer Organization and Architecture	4	✓	
CSC 220	Operating Systems and Systems Programming	4		✓
CSC 230	Software Design and Engineering	4		✓
CSC 301	Advanced Data Structures and Algorithms	4	✓	
CSC 310	Ethics and Impact of Computing (W)	4		✓
CSC 320	Theory of Computation	4		✓
CSC 401	Senior Capstone I	2	✓	
CSC 402	Senior Capstone II	2		✓
	ELECTIVES			
CSC 330	Introduction to Computer Network Security	4		✓
CSC 340	Database Management Systems	4		✓
CSC 350	Web Programming and Development	4		✓
CSC 410	Artificial Intelligence and Machine Learning	4	✓	
CSC 420	Programming Languages and Compilers	4	✓	
	OTHER			
CSC 450	Independent Study in Computer Science	1-4	✓	✓
CSC 499	Special Topics in Computer Science	4	✓	✓

A curriculum flowchart that helps to identify course prerequisites is included at the end of this document.

Course Descriptions

CSC 101 The Science of Computing I
An introduction to computing. Topics include problem solving, algorithm analysis and development, computer programming in Python, data structures, computer organization and architecture, and the object-oriented paradigm.
Prerequisites: None

CSC 102 The Science of Computing II
More in-depth coverage of computing. Topics include problem solving, algorithm analysis and development, object-oriented programming in Python, high-level data structures, computer organization and architecture, and various applications of computing.
Prerequisites: CSC 101 (with a C or better)

CSC 201 Data Structures and Algorithm Analysis
The storage and manipulation of basic data structures such as arrays, linked lists, stacks, queues, trees, hash tables, and graphs.
Prerequisites: CSC 102 (with a C or better)

CSC 210 Computer Organization and Architecture
Architecture and organization of computer systems. Computer organization topics include data representation, digital logic, Boolean algebra, minimization techniques. Computer architecture topics include the CPU, instruction set architectures, memory hierarchy and management, input/output systems, alternative architectures, performance measurement and analysis.
Prerequisites: CSC 102 (with a C or better)

CSC 220 Operating Systems and Systems Programming
An introduction to systems programming (in the context of Linux and C/C++) and operating systems. Topics include linking, writing scripts, performing system calls, managing memory, and using concurrency; process management, storage management, device management, performance, and security.
Prerequisites: CSC 201 (with a C or better)

CSC 230 Software Design and Engineering
Design, construction, and maintenance of large software systems. Project planning, requirements analysis, software design methodologies, software implementation and testing, maintenance.
Prerequisites: CSC 201 (with a C or better)

CSC 301 Advanced Data Structures and Algorithms
Advanced data structures and algorithm design and analysis. Topics include analysis techniques, advanced searching and sorting, advanced data structures (e.g., specialized trees, graphs), algorithm design techniques, and NP-completeness.
Prerequisites: CSC 230 (with a C or better)

CSC 310 Ethics and Impact of Computing (W)
An examination of the ethical, social, and legal implications of computers, computing, communications, and other digital technologies. Emphasis is placed on writing and professional presentations (including debates). This course includes a significant amount of writing through several standalone essays and a major paper that is developed in an iterative process with frequent feedback.
Prerequisites: CSC 230 (with a C or better)

CSC 320 Theory of Computation
An overview of formal languages, the abstract models of computing capable of recognizing those languages, and the grammars used to generate them.
Prerequisites: CSC 301 (with a C or better) and MAT 270 (with a C or better)

CSC 330 Introduction to Computer Network Security
Overview of cyber security. Provides students with practical cyber security experience based on theoretical foundations. Topics include: cryptography, computer network defense, covert channels, reverse engineering, steganography, access control, website exploitation, and other relevant and current topics in security.
Prerequisites: CSC 201 (with a C or better)

CSC 340 Database Management Systems
The theory, design, and implementation of relational database management systems. Topics include effective storage, security, and applied applications of legacy storage. Emphasis on the practical steps towards the creation of effective database management systems and the implementation of a simple database.
Prerequisites: CSC 201 (with a C or better)

CSC 350 Web Programming and Development
A comprehensive overview of website development. Includes both server- and client-side installation, configuration, and programming; database integration; and an overview of security implications and considerations.
Prerequisites: CSC 230 (with a C or better)

CSC 401 Senior Capstone I
This course allows students to integrate what they have learned throughout the curriculum in an applied, real world setting. Students work in teams on a major project, applying software engineering principles along the way. The course also emphasizes professional presentations and technical reports at various points in the project. This is the first half of the senior capstone experience, where teams will begin their work on a major project.
Prerequisites: CSC 301 (with a C or better)

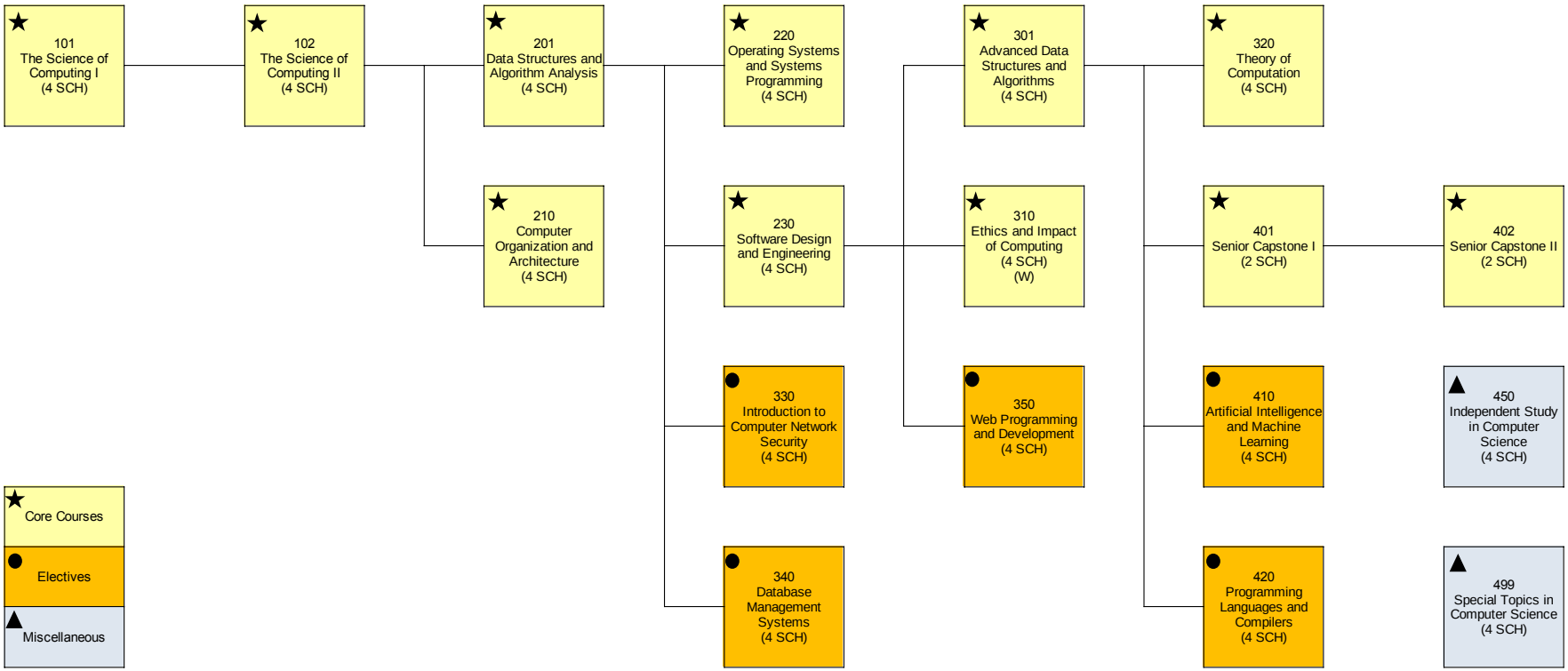
CSC 402 Senior Capstone II
This course allows students to integrate what they have learned throughout the curriculum in an applied, real world setting. Students work in teams on a major project, applying software engineering principles along the way. The course also emphasizes professional presentations and technical reports at various points in the project. This is the second half of the senior capstone experience, where teams will finish their work on a major project and present their results.
Prerequisites: CSC 401 (with a C or better)

CSC 410 Artificial Intelligence and Machine Learning
An overview of AI, including history, impact, implications, and the potential of artificial intelligence. Machine learning: perceptrons, multi-layer networks, and deep learning. Classical AI: game playing and search, propositional logic, first order logic, inference. Knowledge representation.
Prerequisites: CSC 301 (with a C or better)

CSC 420 Programming Languages and Compilers
Techniques for specifying the syntax and semantics of programming languages, including language concepts, execution environments, comparative analysis of programming languages. Principles of compiler design, including lexical analysis, syntax analysis, error detection and recovery.
Prerequisites: CSC 301 (with a C or better)

CSC 450 Independent Study in Computer Science
Independent project developed under the guidance of a computer science faculty member. Students can apply by consulting with and submitting a project proposal to a computer science faculty member for 1-4 credits.
Prerequisites: Junior status, minimum 3.0 GPA, and consent of instructor

CSC 499 Special Topics in Computer Science
A special topics course that allows faculty members to explore topics in computer science. May be repeated for additional credit, with a maximum of 8 credits total.
Prerequisites: consent of instructor


101
The Science of Computing I
(4 SCH)
102
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(4 SCH)
201
Data Structures and Algorithm Analysis
(4 SCH)
210
Computer Organization and Architecture
(4 SCH)
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Operating Systems and Systems Programming
(4 SCH)
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Software Design and Engineering
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Introduction to Computer Network Security
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Database Management Systems
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Advanced Data Structures and Algorithms
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310
Ethics and Impact of Computing
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(W)
350
Web Programming and Development
(4 SCH)
320
Theory of Computation
(4 SCH)
401
Senior Capstone I
(2 SCH)
410
Artificial Intelligence and Machine Learning
(4 SCH)
420
Programming Languages and Compilers
(4 SCH)
402
Senior Capstone II
(2 SCH)
450
Independent Study in Computer Science
(4 SCH)
499
Special Topics in Computer Science
(4 SCH)
Core Courses
Electives
Miscellaneous