

BACHELOR OF SCIENCE IN COMPUTER SCIENCE (CYBERSECURITY)

The Bachelor of Science in Computer Science at Texas Woman's University offers students the opportunity to build a strong foundation of skills and knowledge in a broad and rapidly changing technical field while also allowing them to focus their upper-level studies around topics in Computer Science such as Database Administration, Software Development, Web and Mobile Applications, Networking and Data Communications, Hardware and Robotics, Interface and Information Architecture, and other areas based on student interest and aptitude.

The program seeks to engender student confidence, adaptability, and understanding of real-world and cross-professional applicability of technology for all, regardless of gender, race, ethnicity, or disability.

Students enrolled in the program are offered the opportunity to participate in lively, collaborative, and ever-changing classroom activities and curriculum as facilitated by a diverse, knowledgeable, caring, and eager faculty. Graduates of the program go on to obtain a variety of technology jobs.

Marketable Skills

Defined by the Texas Higher Education Coordinating Board's 60x30 Strategic Plan (<https://reportcenter.highered.texas.gov/agency-publication/miscellaneous/the60x30-strategic-plan/>) as, "Those skills valued by employers that can be applied in a variety of work settings, including interpersonal, cognitive, and applied skills areas. These skills can be either primary or complementary to a major and are acquired by students through education, including curricular, co-curricular, and extracurricular activities."

1. Work effectively as a member of a project team to coordinate database and project development, determine project scope and limitations, critically analyze issues, and solve problems.
2. Develop and implement procedures for data management, data storage and retrieval, evaluating data quality, data security, data transfer, data analysis, modeling, and visualization.
3. Plan, coordinate, and implement security measures to safeguard information in computer files against accidental or unauthorized damage, modification, or disclosure.
4. Design, create, and administer a computer network.
5. Create web-based applications to acquire, present, and deliver data to customers.
6. Demonstrate personal accountability and work habits, integrity, and ethical behavior.
7. Proficient in the software tools to achieve the skills listed, including but not limited to Java, Python, Perl, SQL, NoSQL, R, HTML, JavaScript, PHP, SAS, SPSS, and modeling software.

Admissions

All applicants must meet the general undergraduate admission requirements (<https://catalog.twu.edu/undergraduate/admission-information/>).

Degree Requirements

Total Semester Credit Hours (SCH): 120

Major: 44 SCH; **Required Minor:** 18 SCH

Program Code: COMPSCI.BS.CYBER ; **CIP Code:** 11.0101.00

Texas Core Curriculum

Code	Title	SCHs
ENG 1013	Composition I (10)	3
ENG 1023	Composition II (10)	3
Mathematics (20)		3
Life & Physical Sciences (30)		6
Language, Philosophy, & Culture (40)		3
Creative Arts (50)		3
HIST 1013	History of the United States, 1492-1865 (60)	3
HIST 1023	History of the United States, 1865 to the Present (60)	3
POLS 2013	U.S. National Government (70)	3
POLS 2023	Texas Government (70)	3
Social & Behavioral Sciences (80)		3
CAO: Multicultural-Women's Studies (90)		3
CAO: First Year Seminar, Wellness or Mathematics (91)		3
Total SCHs		42

Courses Required for Major

Code	Title	SCHs
CSCI 1423 & CSCI 1421	Programming Fundamentals I and Programming Fundamentals I - Laboratory	4
CSCI 2443	Computer Organization and Machine Language	3
CSCI 2493	Programming Fundamentals II	3
CSCI 3053	Data Structures	3
CSCI 3413	Software Engineering	3
CSCI 3423	Database Management	3
CSCI 3443 & CSCI 3441	Digital Logic and Computer Architecture and Digital Logic and Computer Architecture - Laboratory	4
CSCI 3503	Operating Systems	3
CSCI 3613	Algorithm Analysis and Design	3
CSCI 4313	Networking and Data Communication	3

Computer Science Electives

Take 12 SCH from the following Essential and Applied Computing courses

Essential options - Take a minimum of 2 of the following courses:

CSCI 3313	App Development for Mobile Devices
CSCI 3323	Robotics Design and Development
CSCI 3703	Interface Design and Development
CSCI 4623	Big Data and High Performance Computing
or CSCI 4723	Machine Learning
CSCI 4803	Programming for the Web
CSCI 4823	Principles of Data Mining

Applied Options - Take a minimum of 1 of the following courses:

CSCI 3103	Applied Computer Graphics
CSCI 3353	Interactive Digital Art
CSCI 3603	Foundations of Data Science

CSCI 3803	Website Development	
CSCI 4303	Advanced Modeling and Visualization	
CSCI 4353	Advanced Interactive Digital Art	
CSCI 4513	Data Warehousing	
Cybersecurity Emphasis		
CSCI 2513	Information Security and Ethics	3
CSCI 3713	Fundamentals of Cryptography	3
CSCI 4343	Digital Forensics	3
CSCI 4463	Ethical Hacking and Systems Defense	3
CSCI 4483	Digital Trust and Privacy	3
CSCI 4623	Big Data and High Performance Computing	3
or CSCI 4723	Machine Learning	
Total SCHs		62

Departmental Requirements

Code	Title	SCHs
MATH 2014	Calculus I	4
MATH 3013	Discrete Mathematics	3
MATH 3073	Matrix Methods	3-4
or MATH 2024	Calculus II	
or MATH 4013	Probability and Statistics	
Electives		6

All students must complete three semester credit hours in approved Global Perspectives courses (graduation requirement).

Plan of Study

First Year

Fall		TCCN	SCHs
CSCI 1423 & CSCI 1421	Programming Fundamentals I and Programming Fundamentals I - Laboratory		4
ENG 1013	Composition I	ENGL 1301	3
HIST 1013	History of the United States, 1492-1865	HIST 1301	3
UNIV 1231	Learning Frameworks: First-Year Seminar	EDUC 1100, EDUC 1200, EDUC 1300	1
Mathematics Core (Math 1313 suggested)			3
Social & Behavioral Sciences Core			3
SCHs			17
Spring		TCCN	
CSCI 2493	Programming Fundamentals II	COSC 1437	3
ENG 1023	Composition II	ENGL 1302	3
HIST 1023	History of the United States, 1865 to the Present	HIST 1302	3
MATH 2014	Calculus I	MATH 2413	4
Creative Arts Core			3
SCHs			16

Second Year

Fall		TCCN	
CSCI 3053	Data Structures		3
CSCI 3423	Database Management		3
POLS 2013	U.S. National Government	GOVT 2305	3

Life & Physical Sciences Core		3
Language, Philosophy, & Culture Core		3

SCHs		15
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Spring		TCCN	
CSCI 2443	Computer Organization and Machine Language	COSC 2425	3
CSCI 3503	Operating Systems		3
POLS 2023	Texas Government	GOVT 2306	3
CAO: Women's Studies (MATH 2053 recommended)			3
Life & Physical Sciences Core			3

SCHs		15
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Third Year

Fall		TCCN	
CSCI 3413	Software Engineering		3
CSCI 3443 & CSCI 3441	Digital Logic and Computer Architecture and Digital Logic and Computer Architecture - Laboratory		4
CSCI 2513	Information Security and Ethics		3
Computer Science Electives			6

SCHs		16
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Spring		TCCN	
CSCI 3613	Algorithm Analysis and Design		3
CSCI 3713	Fundamentals of Cryptography		3
CSCI 4343	Digital Forensics		3
MATH 3013	Discrete Mathematics		3
Elective			3

SCHs		15
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Fourth Year

Fall		TCCN	
CSCI 4313	Networking and Data Communication		3
CSCI 4483	Digital Trust and Privacy		3
Computer Science Elective			3
Elective			3
Elective			2

SCHs		14
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Spring		TCCN	
CSCI 4623 or 4723	Big Data and High Performance Computing or Machine Learning		3
CSCI 4463	Ethical Hacking and Systems Defense		3
MATH 3073, 2024 ,or 4013	Matrix Methods or Calculus II or Probability and Statistics	MATH 2414	3
Computer Science Elective			3

SCHs		12
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Total SCHs:		120
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