

Official Program Outline



HERZING[®]
— UNIVERSITY —

Bachelor of Science in Computer Science

Program Description

Computer science is a dynamic and evolving field that impacts nearly every aspect of modern life. The Bachelor of Science in Computer Science program is designed to equip students with the fundamental knowledge, skills, and communication needed to thrive in the field. The program emphasizes a strong foundation in computer science principles, coupled with hands-on experience and real-world applications. Content includes object-oriented design, human-computer interaction, artificial intelligence, mobile application development, software engineering, and cybersecurity. The program prepares students to excel in the challenging world of technology, offering a deep understanding of theoretical concepts and practical skills necessary for professional success.

Coursework in this program provides a foundation for select industry certifications. These certifications enhance employment opportunities but are not a state specific requirement.

Program Outcomes

Upon completion of this program, the student should be able to:

1. Demonstrate proficiency in object-oriented design, human-computer interaction, artificial intelligence, mobile application development, software engineering, and cybersecurity.
2. Apply computer science concepts to software design and implementation.
3. Build efficient programs to address business needs.
4. Analyze complex technical problems to implement efficient solutions.
5. Analyze data using appropriate tools and techniques to inform decision-making.
6. Communicate technical information to diverse stakeholders.

Program Content

A minimum of 120.00 semester credit hours is required for graduation.

Required Courses

All courses, 67.00 semester credit hours, are required.

Course Number and Name	Prerequisites/Corequisites	Semester Credit Hours
IT 101 MicroComputer Organization	None	3.00
IT 105 Computer Architecture	None	3.00
IT 110 Computer Operating Systems	None	3.00
IT 115 Network Fundamentals	IT 101 MicroComputer Organization	3.00
IT 204 Linux System Administration	None	4.00
IT 210 Enterprise Network Engineering or IT 500 Network Engineering	IT 115 Network Fundamentals or None	3.00
IT 215 Programming in Python	IT 101 MicroComputer Organization	3.00
IT 220 Database Management Systems	IT 101 MicroComputer Organization	3.00

Course Number and Name	Prerequisites/Corequisites	Semester Credit Hours
IT 306 Virtualization	IT 115 Network Fundamentals	3.00
IT 310 Foundations of Cybersecurity	None	3.00
IT 316 Human Computer Interaction	None	3.00
IT 320 Fundamentals of Programming	None / IT 316 Human Computer Interaction	3.00
IT 340 Information Systems Management	None	3.00
IT 346 Information Technology Project Management or IT 520 Project Management for Cybersecurity	None or None	3.00
IT 350 Artificial Intelligence and Machine Learning (AI/ML) or IT 621 Advanced AI and Machine Learning (AI/ML)	None or IT 500 Network Engineering	3.00
IT 368 Cloud Computing	IT 306 Virtualization	3.00
IT 414 Object-Oriented Design	IT 316 Human Computer Interaction, IT 320 Fundamentals of Programming	3.00
IT 415 Algorithm Design and Analysis	IT 320 Fundamentals of Programming	3.00
IT 420 Mobile Application Development	IT 320 Fundamentals of Programming	3.00
IT 425 Software Engineering or IT 615 Software Engineering Management	IT 320 Fundamentals of Programming or IT 500 Network Engineering	3.00
IT 430 Data Analytics or 611 Big Data Analytics	None or IT 500 Network Engineering	3.00
IT 450 Artificial Intelligence (AI) Practitioner	None	3.00

Open Elective Courses

A minimum of 12.00 semester credit hours is required. Eligible students can take approved dual credit graduate level courses to complete a portion of the open electives requirement.

Dual Credit Courses

Eligible students can replace up to 12.00 semester credit hours of the core program requirements with approved dual credit graduate level coursework. A total of 12.00 graduate semester credit hours can be taken throughout the student's program.

Graduate Program	Applicable Dual Credit Courses
Master of Science in Computer Science	IT 500 Network Engineering IT 611 Big Data Analytics IT 615 Software Engineering Management IT 621 Advanced AI and Machine Learning (AI/ML)
Master of Science in Cybersecurity	IT 500 Network Engineering IT 520 Project Management for Cybersecurity

Required Capstone or Internship

3.00 semester credit hours are required.

Course Number and Name	Prerequisites/Corequisites	Semester Credit Hours
IT 491 Technology Capstone Project	Final semester	3.00
IT 499 Internship in Technology	Final semester	3.00

* Online students in some states may not be allowed to take this internship due to state restrictions.

Required Courses in General Education

Students enrolled in this bachelor's degree must complete a minimum of 36.00 semester credit hours in general education distributed among the following disciplines. Refer to the General Education section of the catalog for specific information about courses within each discipline. Courses transferred from other accredited colleges may also be used to meet these requirements.

- EN 104 English Composition I, Semester Credit Hours: 3.00
- EN 111 Information Literacy, Semester Credit Hours: 3.00
- EN 116 Speech, Semester Credit Hours: 3.00
- EN 304 English Composition II, Semester Credit Hours: 3.00
- HU 140 Cultural Diversity, Semester Credit Hours: 3.00
- HU 240 Introduction to Humanities, Semester Credit Hours: 3.00
- HU 340 Humanities and Contemporary Popular Culture, Semester Credit Hours: 3.00
- MA 109 College Algebra, Semester Credit Hours: 3.00
- MA 320 Statistics, Semester Credit Hours: 3.00
- SC 270 Environmental Literacy, Semester Credit Hours: 3.00
- PS 101 Psychology, Semester Credit Hours: 3.00
- SS 350 Social Issues and Technology, Semester Credit Hours: 3.00

Personal and Professional Development Courses

All courses, 2.00 semester credit hours, are required.

Course Number and Name	Prerequisites/Corequisites	Semester Credit Hours
PD 121 Professional Development I	None	1.00
PD 202 Professional Development II	None	1.00

Distribution of Contact Hours by Course				
Course	Lecture Hours	Internship Hours	Total Contact Hours	Credits
IT 101	45.00	0.00	45.00	3.00
IT 105	45.00	0.00	45.00	3.00
IT 110	45.00	0.00	45.00	3.00
IT 115	45.00	0.00	45.00	3.00
IT 204	60.00	0.00	60.00	4.00
IT 210	45.00	0.00	45.00	3.00
IT 215	45.00	0.00	45.00	3.00
IT 220	45.00	0.00	45.00	3.00
IT 306	45.00	0.00	45.00	3.00
IT 310	45.00	0.00	45.00	3.00
IT 316	45.00	0.00	45.00	3.00
IT 320	45.00	0.00	45.00	3.00
IT 340	45.00	0.00	45.00	3.00
IT 346	45.00	0.00	45.00	3.00
IT 350	45.00	0.00	45.00	3.00
IT 368	45.00	0.00	45.00	3.00
IT 414	45.00	0.00	45.00	3.00
IT 415	45.00	0.00	45.00	3.00
IT 420	45.00	0.00	45.00	3.00
IT 425	45.00	0.00	45.00	3.00
IT 430	45.00	0.00	45.00	3.00
IT 450	45.00	0.00	45.00	3.00
IT 491 or IT 499	45.00 or 0.00	0.00 or 135.00	45.00 or 135.00	3.00
PD 121	15.00	0.00	15.00	1.00
PD 202	15.00	0.00	15.00	1.00
Electives	180.00	0.00	180.00	12.00
Gen Ed - Communications	180.00	0.00	180.00	12.00
Gen Ed – Humanities	135.00	0.00	135.00	9.00
Gen Ed – Mathematics	90.00	0.00	90.00	6.00
Gen Ed - Science	45.00	0.00	45.00	3.00
Gen Ed – Social and Behavioral Sciences	90.00	0.00	90.00	6.00
Totals with IT 491 Capstone	1800.00	0.00	1800.00	120.00

Distribution of Contact Hours by Course				
Course	Lecture Hours	Internship Hours	Total Contact Hours	Credits
Totals with IT 499 Internship	1755.00	135.00	1890.00	120.00

New Course Descriptions

Course	Course Description
IT 316 Human Computer Interaction	This course covers a range of topics, including the design and evaluation of user interfaces, user experience, and usability. The course heavily focuses on the user perspective and the human-centered design process, which includes collecting, analyzing, and formalizing user needs.
IT 320 Fundamentals of Programming	This course introduces the fundamental concepts of programming in C++. Students will learn how to write efficient and scalable programs, manage system resources, and implement object-oriented solutions.
IT 414 Object-Oriented Design	This course focuses on the principles and techniques of object-oriented design for building robust and scalable software systems. Students will learn how to apply object-oriented design patterns and create modular code that can be easily maintained and extended.
IT 415 Algorithm Design and Analysis	This course focuses on the systematic analysis of algorithms and their complexities. Students will learn how to evaluate the efficiency of algorithms in terms of time and space and apply various techniques to improve algorithm performance.
IT 420 Mobile Application Development	This course introduces students to mobile programming technologies, mobile design, and mobile application development. Students will evaluate device capabilities, industry standards, operating systems, and the programming necessary to develop basic applications for mobile platforms.
IT 425 Software Engineering	This course introduces students to the fundamentals of software engineering, with a focus on both theory and practical application. Topics covered include the software development lifecycle (SDLC), requirement analysis, architecture and design, implementation, testing, and quality assurance. Students will learn how to plan, build, and test software systems.
IT 430 Data Analytics	This course equips students with essential skills to analyze and interpret data across various industries. It covers statistical analysis, programming and database management, along with principles of data visualization and storytelling. Students will develop both technical proficiency and critical thinking skills to make ethical, data-driven decisions.