



## **BACHELOR OF SCIENCE IN COMPUTER SCIENCE WITH A CONCENTRATION IN SOFTWARE ENGINEERING (BSCSSE)**

### **PROGRAM DESCRIPTION**

The Bachelor of Science in Computer Science With a Concentration in Software Engineering Program employs an integrated and coherent approach that prepares students with the necessary academic knowledge and technical competencies required for a range of positions. The curriculum is focused on designing, implementing, or supporting solutions to business problems in the general categories of information technology, information management, and business communications. Coursework is designed to enhance and build upon the knowledge and skills of students with associate's degrees, completed coursework, or practical experience in either networking or programming applications. Career opportunities include, but are not limited to, such areas as systems analysis, application programming, web design, and network design or administration.

### **PROGRAM OBJECTIVES**

Upon completion of this program students should be able to demonstrate the ability to participate as a team member or to manage projects that:

1. Show mastery of the software engineering or networking knowledge and skills, and professional issues necessary to begin practice in a related field.
2. Work as an individual and as part of a team to develop and deliver quality software or networking artifacts.
3. Reconcile conflicting project objectives, finding acceptable compromises within limitations of cost, time, knowledge, existing systems, and organizations.
4. Design appropriate solutions in one or more application domains using software engineering or networking approaches that integrate ethical, social, legal, and economic concerns.
5. Demonstrate an understanding of and apply current theories, models, and techniques that provide a basis for problem identification and analysis, software design or network design, development, implementation, verification, and documentation.
6. Demonstrate an understanding and appreciation for the importance of negotiation, effective work habits, leadership, and good communication, orally and in writing, with stakeholders in a typical software development or networking environment.
7. Learn new models, techniques, and technologies as they emerge and appreciate the necessity of such continuing professional development.
8. Think critically at a conceptual level and by using mathematical analysis as well as the scientific method; write and speak effectively; use basic computer applications; and understand human behavior in the context of the greater society in a culturally diverse world.

### **POTENTIAL JOB POSITION TITLES**

Potential entry-level job position titles include computer software engineer, computer software application developer, computer software systems engineer, network systems administrator, computer systems administrator, network systems and data communications analyst, database administrator, and computer systems analyst.

### **PROGRAM LENGTH**

The average length of time for a student taking a full course load is 9 semesters (36 months).

### **PROGRAM CONTENT**

A minimum of 138 semester credit hours is required for graduation.

### REQUIRED COURSES IN COMPUTER SCIENCE

All courses, 19 semester credit hours, are required.

Course Number	Course Name	Prerequisite	Credit Hours
BU 345	Project Management	None	3.0
IS 103	Programming Logic	None	4.0
IS 112	Computer Networks	IS 102	4.0
IS 185	Computer Architecture and Troubleshooting I	None	4.0
IS 481	IT Strategic Management	Final semester	4.0

### ELECTIVE COURSES IN COMPUTER SCIENCE

A minimum of 12 semester credit hours is required. Students may take any accounting, business management, human resources, criminal justice, health information management, or homeland security course. At least 3 semester credit hours must be at the 300- or 400-level.

### REQUIRED COURSES IN SOFTWARE ENGINEERING

All courses, 36 semester credit hours, are required.

Course Number	Course Name	Prerequisite	Credit Hours
IS 108	Internet Foundation	IS 102	4.0
IS 109	Object-Oriented Programming 1	IS 103	4.0
IS 180	Database Concepts and Applications I	IS 103	4.0
IS 207	Object-Oriented Programming 2	IS 109	4.0
IS 212	Database Concepts and Applications II	IS 180	4.0
IS 327	Software Engineering I	IS 340	4.0
IS 340	Business Systems Analysis	IS 112	4.0
IS 357	Software Engineering II	IS 327	4.0
IS 390	Advanced Web Development	IS 108 and (IS 180 or IS 182)	4.0

### ELECTIVE COURSES IN SOFTWARE ENGINEERING

A minimum of 28 semester credit hours is required. 8 semester hours of 300- or 400-level courses are required.

Course Number	Course Name	Prerequisite	Credit Hours
IS 119	Current and Emerging Trends in Technology	IS 102	3.0
IS 165	Programming in Java I	IS 103	4.0
IS 170	Visual Basic I	IS 103	4.0
IS 191	Linux Administration	IS 112	4.0
IS 210	Discrete Structures for Computer Science	IS 103 and MA 107	3.0
IS 211	Legacy Systems Introduction	IS 103	4.0
IS 213	C++ Programming	IS 207	4.0
IS 218	Web Graphics	IS 102	4.0
IS 258	Web Scripting	IS 108	4.0

Course Number	Course Name	Prerequisite	Credit Hours
IS 272	Introduction to Computer Security	IS 112	3.0
IS 282	Network Security	IS 191 and NT 180 (or IS 191, NT 160 and NT 170)	4.0
IS 311	XML Programming	IS 108	4.0
IS 312	C# Programming	IS 207	4.0
IS 313	C++ Project	IS 213	4.0
IS 316	Programming in Linux	IS 103	4.0
IS 320	Client-Side Web Site Development	IS 108	4.0
IS 330	Data Warehousing	IS 212	4.0
IS 360	Web Commerce	BU 195 or BU 204	4.0
IS 415	Server-Side Web Development	IS 390	4.0
IS 425	Advanced Specialization	Program GPA of 3.0	4.0
IS 485	Database Administration	IS 212	4.0
NT 120	Emerging Operating Systems	IS 112	4.0
NT 160	Network Operating Systems	IS 185	4.0
NT 170	Server Operating Systems	NT 160	4.0
NT 180	Network and Server Operating Systems	IS 112 or IS 186	4.0
NT 215	Routers and Switches	IS 112	4.0

Note: Students may substitute NT 180 for NT 160 and NT 170.

#### REQUIRED SENIOR PROJECT

4 credit hours are required.

Course Number	Course Name	Prerequisite	Credit Hours
IS 490	Capstone Project	Final semester	4.0
IS 494	Internship	Final semester and PD 214	4.0

#### REQUIRED COURSES IN GENERAL EDUCATION

Students enrolled in bachelor degrees must complete a minimum of 37 semester credit hours in general education distributed among the following disciplines. A minimum of 9 semester credit hours must be upper level (300- to 400-level courses). Refer to the General Education section of the catalog for Herzing University courses that would satisfy these requirements. \*

- 1 Semester Credit Hour in Information Literacy
- 6 Semester Credit Hours in English Composition or Literature
- 3 Semester Credit Hours in Speech
- 4 Semester Credit Hours in Computer Applications ♦
- 7 Semester Credit Hours in Mathematics (College Algebra or Above)
- 4 Semester Credit Hours of Natural Science With a Lab Component
- 3 Semester Credit Hours in Social or Behavioral Science
- 3 Semester Credit Hours in Humanities With a Critical Thinking Focus \*\* ♦
- 3 Semester Credit Hours in Cultural Diversity
- 3 Semester Credit Hours of General Education Electives ♦

\* Transfer students may transfer courses that are within 1 semester credit hour of the courses listed above to meet these discipline requirements. Any resulting deficiency in the total of 37 semester credit hours required in general education may be made up with general education electives from any of the listed disciplines.

\*\* A course with a critical thinking focus would be a course that addresses the theories and application of critical analysis with an emphasis on developing sequential reasoning skills. Examples may be courses in critical thinking, philosophy, logic, or science.

◆ The state of Minnesota requires a minimum of 30 semester credit hours of general education for bachelor degrees, not counting computer applications. However, all Herzing University students in the BSCSSE program must complete a minimum of 37 semester credit hours in general education, including computer applications, to complete the requirement for graduation from this bachelor degree program. Minnesota students must complete at least 4 semester credit hours of general education in the humanities.

### **PERSONAL DEVELOPMENT COURSES**

A minimum of 2 semester credit hours is required. Students taking the IS 494 Internship must also take PD 214.

Course Number	Course Name	Prerequisite	Credit Hours
PD 120	Personal Financial Management	None	1.0
PD 155	Customer Services	None	1.0
PD 200	Career Development Seminar	None	1.0
PD 214	AS/AAS/BS Internship Preparation	None	0.0