

Software Engineering

Composite Major

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Major

Software Engineering (SE) is all around us. The IT industry is a diverse field impacting virtually every business—from the service industry and technology companies to manufacturing specialists and health care professionals within large companies and small businesses. VCSU's Software Engineering, the only major of its kind in the North Dakota University System, prepares students with problem solving skills required to create software solutions to meet the needs of employers. The CSSE Department has joined in Academic Alliances with technology companies such as SAP, Microsoft, and Oracle, using these technologies to complete hands-on projects. Students often work in teams to encourage the learning of group dynamics and soft-skills. Nontraditional IT majors may be interested in Software Engineering because of the inclusion of humanistic issues such as project management, requirements gathering, and human computer interaction. Students with an SE degree can become software engineers, software developers, software architects, IT project managers, business analysts, systems analysts, software developers, cyber security managers and more.

Visit our page at csse.vcsu.edu or watch the video at www.code.org (<http://www.code.org>). You don't have to be a genius, you just have to be determined. You could be the next Mark Zuckerberg (creator of Facebook) or Jack Dorsey (creator of Twitter). Let your dream become a reality at Valley City State University!

Practical Experience

Students are encouraged to work for internship credits while completing their degree in Software Engineering. Companies such as Doosan, Blue Cross Blue Shield of North Dakota, Bobcat, Eide Bailly, Thomson Reuters, Cavendish, John Deere, Microsoft, Appareo Systems, NBC Universal, and Best Buy have welcomed VCSU students in their internship programs. VCSU students develop excellent technology and soft skills and many are hired into full-time positions with these companies after graduation. In addition to internships, cooperative research projects with faculty give students first-hand experience with advanced research techniques. The undergraduate research ranges from Virtual Reality to the Internet of Things. Students also have the opportunity to participate in activities such as company tours, workshops, fairs, and technology conferences.

"I owe VCSU a whole lot for helping me get where I am today, which is having the opportunity to do something I really enjoy every day." —Ryan McCullough '10, Valley City, N.D.; Microsoft developer

General Education Requirements

Code	Title	Credits
English Composition		
Select one of the following:		6
ENGL 110	College Composition I	

ENGL 120 or ENGL 125	College Composition II Introduction to Professional Writing	
ENGL 120 or ENGL 125	College Composition II Introduction to Professional Writing	
ENGL 210	College Composition III	
Speech Communication		
Select one of the following:		3
COMM 110	Fundamentals of Public Speaking	
COMM 212	Interpersonal Communication	
COMM 216	Intercultural Communication	
Mathematics		
Select one of the following:		3
MATH 103	College Algebra	
MATH 104	Finite Mathematics	
MATH 107	Precalculus	
MATH 165	Calculus I	
MATH 210	Elementary Statistics	
Lab Science		
Select two of the following:		8
BIOL 111	Concepts of Biology	
BIOL 150	General Biology I	
BIOL 151	General Biology II	
BIOL 170	General Zoology	
CHEM 115	Introductory Chemistry	
CHEM 116	Introduction to Organic and Biochemistry	
CHEM 121	General Chemistry I	
CHEM 122	General Chemistry II	
GEOL 100	Introduction to Earth Science	
GEOL 106	The Earth Through Time	
PHYS 100	Concepts of Physics	
PHYS 110	Introductory Astronomy	
PHYS 161	Introductory College Physics I	
PHYS 162	Introductory College Physics II	
PHYS 251	University Physics I	
PHYS 252	University Physics II	
TECH 161	Technology, Engineering, and Design	
Wellness		
HPER 100	Concepts of Fitness and Wellness	2
Technology		
Select one of the following:		3
CIS 170	Introduction to Computer Information Systems	
CSCI 127	Introduction to Programming in Java ¹	
CSCI 160	Introduction to Structured Programming I	
SE 110	Discovering Computing	
Humanities		
Literacies		
Select one of the following:		3
ENGL 220	Introduction to Literature	
ENGL 225	Introduction to Film	
ENGL 241	World Literature I	
ENGL 242	World Literature II	
ENGL 261	American Literature I	
ENGL 262	American Literature II	
HUM 201	Civilization, Thought, and Literary Heritage	
SPAN 101	1st Year Spanish I	
SPAN 102	1st Year Spanish II	
SPAN 201	2nd Year Spanish I	

SPAN 202	2nd Year Spanish II
THEA 110	Introduction to Theatre Arts
THEA 161	Acting One

Art and Music

Select one of the following: 3

ART 110	Introduction to the Visual Arts
HUM 202	Fine Arts and Aesthetics
MUS 100	Music Appreciation
MUS 101	Music Fundamentals
MUS 207	History of Rock and Roll

Social Science

Select two of the following: 6

COMM 112	Understanding Media and Social Change
COMM 114	Human Communication
ECON 201	Principles of Microeconomics ¹
ECON 202	Principles of Macroeconomics
GEOG 151	Human Geography
HIST 103	United States to 1877
HIST 104	United States to Present
HIST 211	World Civilizations to 1500
HIST 212	World Civilizations since 1500
HIST 260	Women in America
HIST 267	Environmental History
HIST 270	Native American Studies
POLS 115	American National Government
POLS 116	State and Local Government
PSYC 111	Introduction to Psychology ¹
SOC 110	Introduction to Sociology
SOC 111	Introduction to Anthropology

Additional Humanities or Social Science

Select one additional course from Humanities or Social Science or select from the following: 2

ART 112	Design
ART 130	Drawing I
ART 150	Ceramics I
GEOG 111	Survey of Geography
MUS 104	Group Piano for Non-Majors
MUS 105	Group Piano for Non-Majors
MUS 130	Valkyries
MUS 131	Concert Choir
MUS 140	Athletic Band
MUS 141	Concert Band
PHYS 275	Planetarium Science
THEA 201	Theatre Practicum

Total Credits 39

¹ Required**Major Requirement**

Code	Title	Credits
Required Courses		
CIS 128	Microcomputer Hardware I	3
CIS 164	Networking Fundamentals I	3
COMM 360	Group Dynamics	3
CSCI 160	Introduction to Structured Programming I	3
CSCI 161	Introduction to Structured Programming II	3
MATH 208	Discrete Mathematics	3
MATH 321	Applied Probability and Statistics	3
SE 110	Discovering Computing	3

SE 201	Introduction to Software Engineering	3
SE 211	Software Construction	3
SE 212	Software Engineering Approach to Human Computer Interaction	3
SE 242	Data Structures	3
SE 311	Software Design and Architecture	3
SE 321	Software Quality Assurance and Testing	3
SE 380	Systems Analysis and Design	3
SE 381	Project Management	3
SE 385	Database Theory/Design	3
SE 370	Computer Organization & Systems	3
SE 379	Social Implications of Computers	3
SE 480	Capstone	3

Directed Electives

Select one of the following options: 12

Option 1: Enterprise Systems Specialty

CIS 369	Enterprise Systems
CIS 371	Enterprise Systems II
CIS 475	Integration of Business Processes in SAP ERP

Option 2: Science Specialty

12 credits of major only science courses and approval from advisor. Possible options include:

BIOL 150	General Biology I
BIOL 151	General Biology II
BIOL 170	General Zoology
PHYS 251	University Physics I
PHYS 251L	University Physics I Lab
PHYS 252	University Physics II
PHYS 252L	University Physics II Lab
PHYS 294	Independent Study
PHYS 494	Undergraduate Research

Additional specialties may be chosen with advisor approval. Please consult with your advisor.

Total Credits 72

Total General Education 39 Hrs**Total Major Requirement 72 Hrs****Total Credits Needed to Graduate 120 Hrs**For degree and graduation requirements, visit degree requirements and graduation requirements (<http://catalog.vcsu.edu/undergraduate-catalog/academic-affairs/degree-requirements>).