VALLEY CITY STATE UNIVERSITY

Program Fact Sheet

www.vcsu.edu - catalog.vcsu.edu - 101 College St SW, Valley City, ND 58072 - 800-532-8641 - 701-845-7202

Department of Computer Systems and Software Engineering

McFarland Hall 138
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www.vcsu.edu/departments/computer-systems-and-software-engineering/ (https://www.vcsu.edu/departments/computer-systems-and-software-engineering/)

Today's global economy is more competitive than ever, and VCSU is a great place to launch a successful career. In Computer Systems and Software Engineering programs, students learn to solve problems using technology in the solution. Faculty bring real-world experience to the classroom so they know how to apply the principles they teach. VCSU has partnerships with leading Enterprise Software providers (including Microsoft and SAP) and incorporates software into the curriculum so students graduate with hands-on experience. Faculty build relationships with area businesses to create more opportunities for internships. Innovative programs like the software engineering major as well as CRM and Enterprise Applications certificates give students specialized skills that employers demand.

CSSE Value Statements

Our Programs

We create a supportive, encouraging, and challenging learning environment. This motivates students to learn, experiment, and focus on goals with the confidence of being enrolled in a strong academic program dedicated to continuous improvement.

Our Students

When our students feel a part of our academic community they dedicate themselves to their studies, persevere through challenges, and reach success. We celebrate together in their accomplishments.

Our Colleagues

We treat each other with respect, seek opportunities to engage in the work of the department, provide or support leadership, and strive for continuous improvement in our courses and programs.

Our Stakeholders

We welcome interactions with our community, industry, and academic stakeholders. We take ideas under advisement and identify program improvements for the betterment of society.

Our Lives

We encourage healthy lifestyles and respect individual needs to care for our bodies, minds, and souls. Taking care of ourselves allows us to be fully engaged while doing our jobs.

Du, Yang (2019) Assistant Professor; B.E.E., Ph.D. Beihang University

Ma, Yongchao (2020) Assistant Professor; B.S. Jilin University; M.S. Dalian University of Technology; M.S. North Dakota State University

Pfeifer, Susan (2005) Professor; B.A. Jamestown College, M.S. University of St. Thomas; P.M.P., SAP Certified Associate

Wang, Xin (2024) Assistant Professor; B.Eng. Nanjing University Jiangsu China, M.S. North Dakota State University, Ph.D. Beijing University Beijing China

Majors

- Computer Information Systems – Composite (B.A., B.S.) (http://catalog.vcsu.edu/undergraduate-catalog/programs/majors/computer-information-systems/)
- Data Analytics and Visualization - Composite (B.A., B.S.) (http://catalog.vcsu.edu/undergraduate-catalog/programs/majors/data-analytics-and-visualization/)
- Software Engineering – Composite (B.A., B.S.) (http://catalog.vcsu.edu/undergraduate-catalog/programs/majors/software-engineering/)

Minor

- Computer Science (http://catalog.vcsu.edu/undergraduate-catalog/programs/minors/computer-science/)
- Data Analytics and Visualization (http://catalog.vcsu.edu/undergraduate-catalog/programs/minors/data-analytics-and-visualization/)

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Associate of Arts

- Associate of Arts - Cybersecurity Concentration (http://catalog.vcsu.edu/undergraduate-catalog/programs/associate-arts/cybersecurity-concentration/)

Certificates

- Customer Relationship Management (http://catalog.vcsu.edu/undergraduate-catalog/programs/certificates/customer-relationship-management/)
- Cybersecurity for Information Systems Management (http://catalog.vcsu.edu/undergraduate-catalog/programs/certificates/cybersecurity-for-information-systems-management/)
- Data Analytics and Visualization (http://catalog.vcsu.edu/undergraduate-catalog/programs/certificates/data-analytics-and-visualization/)
- Enterprise Applications (http://catalog.vcsu.edu/undergraduate-catalog/programs/certificates/enterprise-applications/)
- Software Development (http://catalog.vcsu.edu/undergraduate-catalog/programs/certificates/software-development/)

CIS 104. Microcomputer Database. 2 Credits.
An introduction to database design including data entry, storage, and retrieval.
Typically Offered: On sufficient demand.
Prerequisite: CIS 170.

CIS 105. Microcomputer Spreadsheets. 2 Credits.
An introduction to spreadsheets as used for data analysis and reporting including in-depth concepts and features and the types of applications adaptable to this software.
Typically Offered: On sufficient demand.
Prerequisite: CIS 170 or CSCI 160.

CIS 128. Microcomputer Hardware I. 3 Credits.
An introduction to the development and maintenance of the personal computer. Participants upgrade and assemble personal computers, configure systems, and install operating systems.
Typically Offered: On sufficient demand.

CIS 129. Microcomputer Hardware II. 3 Credits.
This course helps students gain a higher level of skills in the diagnosis of hardware and software faults and the upgrading of computer systems. Software adaption to hardware, installation, and troubleshooting of network hardware including modems, network interfaces, and peripheral connections and local area network hardware design covered.

Typically Offered: On sufficient demand.
Prerequisite: CIS 128.

CIS 142. Ethical Hacking & Network Defense. 3 Credits.
This course provides an in-depth understanding of how to effectively protect computer networks. Also covered is a thorough update of federal and state computer crime laws, as well as changes in penalties for illegal computer hacking.
Typically Offered: On sufficient demand.

CIS 147. Principles of Information Security. 3 Credits.
A thorough examination of the field of information security. This course prepares students to make decisions about securing information in a business or personal environment.
Typically Offered: Spring.

CIS 162. Operating Systems. 3 Credits.
An in-depth coverage of the Windows operating systems geared for those students enrolled in Information Technology programs or students who want a more advanced Windows course.
Typically Offered: On sufficient demand.

CIS 164. Networking Fundamentals I. 3 Credits.
Students learn how to install a network operating system, configure and administer various networking components.
Typically Offered: On sufficient demand.

CIS 165. Networking Fundamentals II. 3 Credits.
This course will enable students to learn about more advanced computer routing skills. Following a review of the basic concepts, participants will concentrate on router configuration and LAN switching. Beginning network management principles will be learned.
Typically Offered: On sufficient demand.
Prerequisite: CIS 164.

CIS 170. Introduction to Computer Information Systems. 3 Credits.
An introduction to word processing, spreadsheet, database, and operating system software. Additional topics include the history, ethics, and uses of computers in society, and emerging applications for computers.
Typically Offered: Fall, Spring.

CIS 180. Creating Web Pages I. 3 Credits.
An introduction to web page creation including topics such as HTML/XHTML, Cascading Style Sheets (CSS), fundamentals of site layout and design, and technical implementation of websites.
Typically Offered: On sufficient demand.

CIS 181. Creating Web Pages II. 3 Credits.
Students create web sites using a current version of a graphical user interface (GUI) web authoring tool.
Typically Offered: Spring.
Prerequisite: CIS 180.

CIS 194. Independent Study. 1-3 Credits.
Directed reading, study, and/or activities in selected topics.
Typically Offered: On sufficient demand.
Repeatable: Up to 12 Credits.

CIS 199. Special Topics. 1-4 Credits.
Courses not offered in the regular catalog that provide an opportunity to extend student learning.
Typically Offered: On sufficient demand.
Repeatable: Up to 12 Credits.

CIS 276. Business Language. 3 Credits.
An introduction to computer programming in a business environment. Topics include: fundamentals of program design, development, testing, implementation and documentation of common business-oriented applications. The class will utilize a current version of Microsoft Visual Basic or equivalent software.
Typically Offered: On sufficient demand.

CIS 297. Internship. 1-6 Credits.
An opportunity for students to apply classroom learning to an on-the-job work experience. Internship must be related to the student's course of study and may be in any geographic location. Credit is granted in the range of one to six hours per semester and may be repeated up to a maximum of 6 credit hours. Application and approval through Career Services.
Typically Offered: Fall, Spring, Summer.
Prerequisites: Freshman Standing or Sophomore Standing and cumulative GPA of 2.00 or higher..
Grading: S/U only.
Repeatable: Up to 6 Credits.

CIS 299. Special Topics. 1-4 Credits.
Courses not offered in the regular catalog that provide an opportunity to extend student learning.
Typically Offered: On sufficient demand.
Repeatable: Up to 12 Credits.

CIS 329. Information Systems Management. 3 Credits.
An introduction to managing information systems including user support issues and careers in a business environment.
Typically Offered: Spring.

CIS 341. Customer Relationship Management Software Administration. 3 Credits.
Instruction in administration of various aspects of Customer Relationship Management (CRM) software. Topics include setting up and managing users, security and data access, customization, reports, and support. This class will use Salesforce or a similar software package.
Typically Offered: Spring.

CIS 355. Data Analytics. 3 Credits.
This course equips students with the skills to analyze enterprise data using modern analytics platforms. Students will learn to process and analyze data, incorporating AI techniques to support decision-making within an organizational context. The course emphasizes practical applications, enabling students to extract insights, optimize enterprise processes, and leverage AI-driven analytics for enhanced outcomes. Students will be proficient in using analytics tools to drive data-informed strategies in a professional setting.
Typically Offered: Spring.
Prerequisites: CIS 104 and CIS 105.

CIS 369. Enterprise Systems. 3 Credits.
An exploration of how enterprise systems help companies integrate business functions and improve business processes. Students will identify and discuss integration points including impacts to accounting.
Typically Offered: Fall.
Same As: ACCT 369/CIS 369.

CIS 371. Enterprise Systems II. 3 Credits.
An exploration of how organizations analyze and implement ERP systems or other relevant enterprise systems by completion a project to configure, implement, and test business processes. This course builds upon knowledge in other courses using ERP.
Typically Offered: Spring.

CIS 388. Introduction to Machine Learning. 3 Credits.
An introduction to data mining and machine learning concepts and applications as they relate to artificial intelligence used in business.
Typically Offered: Fall.
Prerequisite: CIS 105.

CIS 394. Independent Study. 1-3 Credits.
Directed reading, study, and/or activities in selected topics.
Typically Offered: On sufficient demand.
Repeatable: Up to 12 Credits.

CIS 399. Special Topics. 1-4 Credits.
Courses not offered in the regular catalog that provide an opportunity to extend student learning.
Typically Offered: On sufficient demand.
Repeatable: Up to 12 Credits.

CIS 410. Advanced Business Languages. 3 Credits.
An exploration of intermediate and advanced topics in business languages utilizing Visual Basic or equivalent software.
Typically Offered: On sufficient demand.
Prerequisite: CIS 276.

CIS 420. Internet Languages. 3 Credits.
Instruction in intermediate and advanced Internet language and the theory needed to integrate databases for web-based applications such as E-commerce.
Typically Offered: On sufficient demand.
Prerequisite: CIS 180.

CIS 440. Advanced Digital Web Design. 3 Credits.
Instruction in digital design theory and intermediate to advanced web languages needed to create complex and effective web sties.
Typically Offered: On sufficient demand.
Prerequisite: CIS 180.

CIS 460. Enterprise Architecture. 3 Credits.
This course explores the design, implementation and management of enterprise IT solutions.
Typically Offered: On sufficient demand.

CIS 465. IS Strategy Management and Acquisition. 3 Credits.
This course explores the issues and approaches in managing the information systems function in organizations and how the IS function integrates, supports and enables various types of organizational capabilities.
Typically Offered: Fall, even years.

CIS 470. Customer Relationship Management (CRM) and Business Intelligence (BI). 4 Credits.
An exploration of Customer Relationship Management (CRM) and Business Intelligence (BI) and how CRM and BI software systems are used by organizations to support their strategic goals. This course covers business analysis on data warehousing systems.
Typically Offered: Fall, odd years.

CIS 475. Integration of Business Processes in SAP ERP. 6 Credits.
Immersion into the concepts of ERP and integration points between different business disciplines supporting each business process cycle. This course introduces the basic processes of SAP ERP.
Typically Offered: On sufficient demand.

CIS 497. Internship. 3-12 Credits.
An opportunity for students to apply classroom learning to an on-the-job work experience. Internship must be related to the student's major or minor course of study and may be in any geographic location. Credit is granted in the range of three to twelve hours per semester and may be repeated up to a maximum of 12 credit hours. Application and approval through Career Services.
Typically Offered: Fall, Spring, Summer.
Prerequisites: Junior Standing or Senior Standing and cum GPA of 2.50 or higher.
Grading: S/U only.
Repeatable: Up to 12 Credits.

CIS 499. Special Topics. 1-4 Credits.
Courses not offered in the regular catalog that provide an opportunity to extend student learning.
Typically Offered: On sufficient demand.
Repeatable: Up to 12 Credits.

CSCI 120. Introduction to Programming. 3 Credits.
An introduction to computer programming using any programming language.
Typically Offered: Spring, even years.
Prerequisite: ASC 93 or higher.

CSCI 124. C++ I. 4 Credits.
An introduction to programming in C++. The course is only offered online.
Typically Offered: On sufficient demand.

CSCI 127. Introduction to Programming in Java. 3 Credits.
An introduction to computer programming using the Java language.
Typically Offered: Spring.
Prerequisite: ASC 93 or higher.

CSCI 160. Introduction to Structured Programming I. 3 Credits.
An introduction to structured programming using C++. Topics include input, output, looping and decision structures, subprograms, and interface to a GUI operating system.
Typically Offered: Spring.
Prerequisite: ASC 93 or higher.

CSCI 161. Introduction to Structured Programming II. 3 Credits.
A continuation of CSCI 160. Topics include: Arrays, structures, object-orientated programming, inheritance, polymorphism string manipulation, recursion and pointers.
Typically Offered: Fall.
Prerequisite: CSCI 160.

CSCI 174. C++ II. 4 Credits.
An intermediate course in programming in C++. The course is offered only online.
Typically Offered: Fall, Spring.

CSCI 199. Special Topics. 1-4 Credits.
Courses not offered in the regular catalog that provide an opportunity to extend student learning.
Typically Offered: On sufficient demand.
Repeatable: Up to 12 Credits.

CSCI 222. Data Analysis and Visualization. 3 Credits.
An introduction to the theories, methods, and techniques of data analysis and visualization, with an emphasis on practical applications. Students will use tools such as Python and its associated libraries to explore real-world datasets. The course covers essential skills in data collection, cleaning, analysis, and visualization, employing statistical and computational methods to uncover insights from data.
Typically Offered: Fall.
Prerequisite: CSCI 120.

CSCI 242. Data Structures. 3 Credits.
The study of abstract data types (ADTs) and alternatives for implementation of lists, arrays, sets, trees, and graphs. The course explores dynamic and static data structures; time and space analysis of algorithms for initializing; and accessing, searching, sorting and traveling. Cross referenced with SE 242.
Typically Offered: Spring.
Prerequisite: CSCI 161.
Same As: CSCI 242/SE 242.

CSCI 277. Game Development. 3 Credits.
An introduction and practice to game development, using industry-standard tools to provide an engaging platform where students can learn and apply a wide range of skills. These skills include programming, artificial intelligence, computer graphics, 3D modeling, animation, human-computer interaction, problem-solving, and teamwork.
Typically Offered: Spring.
Prerequisites: CSCI 160 or CSCI 127.

CSCI 289. Social Implications of Computer Technology. 3 Credits.
An introduction to the effects of computer technology on society and individuals and to ethical problems faced by computer professionals. Topics covered include privacy, the nature of work, centralization versus decentralization and the need for human factors analysis in the development of a new computer system.
Typically Offered: Fall.

CSCI 299. Special Topics. 1-4 Credits.
Courses not offered in the regular catalog that provide an opportunity to extend student learning.
Typically Offered: On sufficient demand.
Repeatable: Up to 12 Credits.

CSCI 350. Assembly Language Programming. 3 Credits.
An exploration of microprocessor-based machine and assembly language concepts.
Typically Offered: Spring, even years.
Prerequisite: CSCI 370.

CSCI 365. Programming Language Topics. 3 Credits.
A study of program design, style, expression, debugging and testing in specific programming languages such as Ada, C/C++, Lisp, Logo, Modula-2, Pascal, Prolog, or Visual BASIC. Course may be repeated for different languages.
Typically Offered: On sufficient demand.
Prerequisite: CSCI 160.
Repeatable: Up to 6 Credits.

CSCI 370. Computer Organization & Systems. 3 Credits.
An examination of the fundamentals of computer organization and operating system concepts. Cross referenced with SE 370

Typically Offered: Fall, even years.
Prerequisite: CSCI 160.
Same As: CSCI 370/SE 370.

CSCI 372. Comparative Programming Languages. 3 Credits.
A comparison of the features of several different programming languages with regards to syntax and semantics.
Typically Offered: On sufficient demand.
Prerequisite: CSCI 161.

CSCI 380. Teaching Computer Science. 3 Credits.
An investigation of objectives, methods, techniques, materials, software, and activities related to the teaching of computer science.
Typically Offered: On sufficient demand.
Prerequisite: Admitted to Teacher Education.

CSCI 399. Special Topics. 1-4 Credits.
Courses not offered in the regular catalog that provide an opportunity to extend student learning.
Typically Offered: On sufficient demand.
Repeatable: Up to 12 Credits.

CSCI 450. Practicum in Computer Science. 1-3 Credits.
Experience in the use of computer hardware and software and the opportunity to observe and assist in the management of a computer laboratory.
Typically Offered: On sufficient demand.
Prerequisite: CSCI 370.
Grading: S/U only.

CSCI 494. Undergraduate Research. 3-12 Credits.
The course is designed to integrate subject matter from major coursework and other disciplines into a project that leads to the creation of an original body of knowledge.
Typically Offered: On sufficient demand.
Repeatable: Up to 12 Credits.

CSCI 497. Internship. 3-12 Credits.
An opportunity for students to apply classroom learning to an on-the-job work experience. Internship must be related to the student's major or minor course of study and may be in any geographic location. Credit is granted in the range of three to twelve hours per semester and may be repeated up to a maximum of 12 credit hours. Application and approval through Career Services.
Typically Offered: Fall, Spring, Summer.
Prerequisites: Junior Standing or Senior Standing and cum GPA of 2.50 or higher.
Grading: S/U only.
Repeatable: Up to 12 Credits.

SE 110. Discovering Computing. 3 Credits.
This course will provide an overview of topics ranging from history of computing, problem solving, algorithmic thinking, and concepts behind software development. Students will use graphical programming tools to compute, investigate and implement solutions. This should be suitable for students who want to learn about computing concepts.
Typically Offered: Fall.

SE 199. Special Topics. 1-4 Credits.
Courses not offered in the regular catalog that provide an opportunity to extend student learning.
Typically Offered: On sufficient demand.
Repeatable: Up to 12 Credits.

SE 201. Introduction to Software Engineering. 3 Credits.
An introduction to principles of software engineering concepts including lifecycle models, requirements, design, implementation, testing, documentation and the related tools and techniques.
Typically Offered: Fall.

SE 211. Software Construction. 3 Credits.
An introduction to low-level design issues, including formal approaches, basics of formal languages, overview of principles of programming languages, criteria for selecting languages and platforms, tools for automating design and construction, and concurrency.
Typically Offered: Spring.
Prerequisite: SE 201.

SE 212. Software Engineering Approach to Human Computer Interaction. 3 Credits.
Overview of a wide variety of topics relating to designing and evaluating user interfaces, as well as psychological principles of human-computer interaction.
Typically Offered: Spring.

SE 242. Data Structures. 3 Credits.
The study of abstract data types (ADTs) and alternatives for implementation of lists, arrays, sets, trees, and graphs. The course explores dynamic and static data structures; time and space analysis of algorithms for initializing; and accessing, searching, sorting and traveling. Cross referenced with CSCI 242.
Typically Offered: Spring.
Prerequisite: CSCI 161.
Same As: CSCI 242/SE 242.

SE 299. Special Topics. 1-4 Credits.
Courses not offered in the regular catalog that provide an opportunity to extend student learning.
Typically Offered: On sufficient demand.
Repeatable: Up to 12 Credits.

SE 311. Software Design and Architecture. 3 Credits.
An in-depth coverage of advanced software design, particularly aspects relating to distributed systems and software architecture.
Typically Offered: Fall.
Prerequisite: SE 211.

SE 321. Software Quality Assurance and Testing. 3 Credits.
A broad coverage of software quality and testing to include quality assurance, inspections and reviews, software validation, and testing techniques.
Typically Offered: Spring, odd years.
Prerequisite: SE 201.

SE 331. Customer Relationship Management Software Development. 3 Credits.
Instruction in programming languages used in Customer Relationship Management (CRM) software. Topics include logic and process automation, user interfaces, testing, debugging, and deployment in a CRM software package such as Salesforce or equivalent software.
Typically Offered: Fall.
Prerequisite: SE 110 or CSCI 127 or CSCI 160.

SE 370. Computer Organization & Systems. 3 Credits.
An examination of the fundamentals of computer organization and operating system concepts. Cross referenced with CSCI 370.
Typically Offered: Fall, even years.
Prerequisite: CSCI 160.
Same As: CSCI 370/SE 370.

SE 376. Embedded Systems. 3 Credits.
A study of micro-controller hardware and software, with an emphasis on interfacing the micro-controller with external electronic devices such as transceivers, sensors, and actuators for communications and control within an embedded system.
Typically Offered: Spring.
Same As: PHYS 376/SE 376.

SE 380. Systems Analysis and Design. 3 Credits.
A practical approach to systems analysis and design using a blend of traditional development methods and current technologies with a focus on gathering requirements.
Typically Offered: Fall.

SE 381. Project Management. 3 Credits.
An investigation of the project management techniques and appropriate software used to effectively manage projects. This course covers the knowledge areas and other topics as defined by the Project Management Body of Knowledge (PMBOK). Cross-referenced with MGMT 381.
Typically Offered: Spring; Summer even years.
Same As: MGMT 381/SE 381.

SE 385. Database Theory/Design. 3 Credits.
An introduction to relational database concepts, theory, design and management.
Typically Offered: Fall.

SE 399. Special Topics. 1-4 Credits.
Courses not offered in the regular catalog that provide an opportunity to extend student learning.
Typically Offered: On sufficient demand.
Repeatable: Up to 12 Credits.

SE 480. Capstone. 3 Credits.
A capstone course that provides students, working in groups, with a significant project experience in which they can integrate much of the material they have learned in their program, including matters relating to requirements, design, human factors, professionalism, and project management.
Typically Offered: Spring.
Prerequisite: Senior Standing.

SE 494. Undergraduate Research. 3-12 Credits.
The course is designed to integrate subject matter from major coursework and other disciplines into a project that leads to the creation of an original body of knowledge.
Typically Offered: Not Specified.
Repeatable: Up to 12 Credits.

SE 497. Internship. 3-12 Credits.
An opportunity for students to apply classroom learning to an on-the-job work experience. Internship must be related to the student's major or minor course of study and may be in any geographic location. Credit is granted in the range of three to twelve hours per semester and may be repeated up to a maximum of 12 credit hours. Application and approval through Career Services.
Typically Offered: Fall, Spring, Summer.
Prerequisites: Junior Standing or Senior Standing and cum GPA of 2.50 or higher.
Grading: S/U only.
Repeatable: Up to 12 Credits.