Department of Technology

McCarthy Hall 156
Department Chair: Jason Dockter, M.Ed.
Assistant: Teresa Cole
teched@vcsu.edu
(800) 532-8641 extension 37444
(701) 845-7444
http://teched.vcsu.edu

The Department of Technology offers several completely online options, including Technology Education, Career and Technical Education (CTE), and STEM Education.

Technology Education and STEM Education options are based on the Standards for Technological Literacy, Common Core, and Next Generation Science Standards. Paths to certificate/endorsement or licensure may include on-campus or online delivery of courses. The program has the flexibility to be offered as a four-year degree or may include a Technology Education content major only to fill a deficiency for endorsement or licensure as per requirements in your home state.

The CTE major prepares you for teaching positions in school CTE programs, post-secondary technical programs, and private technical colleges. The CTE composite major allows you to transfer in your associate degree and/or experience and teach in trade, industry, technical, or health service areas such as automotive technology, construction technology, electronics, health careers, and welding. The degree requirements may also include full certification by the North Dakota Department of Career and Technical Education for trade, industry, technical, and health education teachers. Non-teaching program graduates may seek entrepreneurial careers in the private sector.

Master of Education

For more information on the Master of Education program, please see the Graduate Program (http://catalog.vcsu.edu/graduate-catalog/programs/) section of this catalog.

Dockter, Jason (2018) Instructor; B.S. Minnesota State University - Moorhead, M.Ed. Valley City State University

Krumwiede, Elisa (2019) Instructor; B.S. North Dakota State University, B.S., M.Ed. Valley City State University

Mannie, Clayton (2020) Assistant Professor; B.S., M.Ed. Valley City State University

Ross, Richard (1999) Associate Professor; B.A., B.S. Minot State University, M.S. Tri-College University

Majors

- Career and Technical Education - Composite (B.S.) (http://catalog.vcsu.edu/undergraduate-catalog/programs/majors/career-technical-education/)
- Career and Technical Education B.S in Education - Composite (B.S. in Education) (http://catalog.vcsu.edu/undergraduate-catalog/programs/majors/career-technical-education-bs-education/)
- Technology Education (B.S. in Education) (http://catalog.vcsu.edu/undergraduate-catalog/programs/majors/technology-education/)

Minor

- Technology Education (http://catalog.vcsu.edu/undergraduate-catalog/programs/minors/technology-education/)

Certificates

- STEM Education–Elementary (http://catalog.vcsu.edu/undergraduate-catalog/programs/certificates/stem-education-elementary/)
- STEM Education–Secondary (http://catalog.vcsu.edu/undergraduate-catalog/programs/certificates/stem-education-secondary/)

Endorsement

- STEM Education

CTE 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.

CTE 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.

CTE 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.

CTE 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.

CTE 431. History, Philosophy and Practices of Career and Technical Education. 3 Credits.
A study of history, growth, theory and present status of Career and Technical Education in secondary and post-secondary schools. The course focuses on principles, practices and major issues of Career and Technical Education and its relationship to individual Career and Technical service areas. This course will also cover relationships between general education and Career and Technical Education.
Typically Offered: Fall, Summer.

CTE 432. Coordinating Cooperative Education Learning. 3 Credits.
A study of principles and techniques used in coordinating cooperative work experiences for students in Career and Technical Education. Included is a study of labor laws, public relations programs, advisory committees, and organization and supervision of on-the-job training, evaluation, and follow-up of student learners.
Typically Offered: On sufficient demand.

CTE 434. Leadership in Career and Technical Student Organizations. 3 Credits.
Introduction to planning, implementing, and leading Career and Technical Student Organizations. This course is designed for advisors at the secondary and post-secondary level wishing to begin, expand, or promote Career and Technical Student Organizations.
Typically Offered: Spring, Summer.

CTE 437. Student Performance Evaluation in Career and Technical Education. 3 Credits.
An examination of methods used for a comprehensive program of assessing and evaluating student achievement. Included is a study of the need for a system of evaluation and construction of evaluative instruments to measure learner outcomes to enhance improved academic and work performance.
Typically Offered: Fall.

CTE 438. Developing and Managing Competency-Based Instructional Materials. 3 Credits.
A basic course for Career and Technical educators. The course introduces concepts supporting the development of competency-based education (CBE) curriculum materials. CBE terminology, illustrations, presentations, procedures, and resources that relate to Career and Technical Education are discussed and a CBE learning unit of instruction is developed.
Typically Offered: Spring, Summer.

CTE 490. Methods for Teaching Career & Technical Education Subjects. 3 Credits.
A concentration on methods used for teaching Career and Technical Education courses. Topics are designed to develop and enhance the instructional competencies for teachers in Career and Technical Education programs.
Typically Offered: Spring, Summer.

CTE 492. Career and Technology Education Teaching Experience. 1-12 Credits.
Provides an online supervised teaching mentorship program to be used in place of a student teaching experience when a mentorship is allowed for satisfying the requirements of licensure. Students will observe mentor teacher(s), prepare units for delivery of content, maintain a log of activities, conduct or participate in parent/teacher conferences, observe or participate in IEP meetings, and meet with mentors and supervisors as required.
Typically Offered: On sufficient demand.

CTE 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.

CTE 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.

STEM ED 160. Integrative Physical Science for Elementary. 4 Credits.
A conceptual physical science course intended for elementary education majors. Topics include the study of the structure and properties of matter, interactions and energy, interactions and forces, interactions and systems (electricity and magnetism), and the study of waves (including light and sound).
Typically Offered: Fall, Spring, Summer.

STEM ED 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.

STEM ED 306. Inventions and Innovations - Technology Education for Children. 2 Credits.
A course focused on technology and society, invention and innovation, engineering for children, evaluating available integrated STEM curricula, as well as exploring methods for the implementation of integrated STEM activities in the elementary classroom. (Elementary)
Typically Offered: Fall.

STEM ED 306L. Inventions and Innovations - Technology Education for Children Lab. 1 Credit.
An opportunity to participate in lab-format activities that support the STEM ED 306 course.
Typically Offered: Fall.

STEM ED 310. Design, Technology and Engineering for Children. 2 Credits.
A course focused including technology, design and the engineering process, as well as methods integrating STEM activities into thematic units in the elementary school curriculum. (Elementary)
Typically Offered: Summer.

STEM ED 310L. Design, Technology and Engineering for Children Lab. 1 Credit.
An opportunity to participate in lab-format activities that support the STEM ED 310 course. (Elementary)
Typically Offered: Summer.

STEM ED 331. Innovation and Engineering Design. 2 Credits.
Prepares prospective teachers to teach a middle school course using engineering design concepts and activities to understand how criteria, constraints, and processes affect designs. Activities include brainstorming, visualizing, modeling, constructing, testing and refining designs.
Typically Offered: Summer.

STEM ED 331L. Innovation and Engineering Design Lab. 1 Credit.
An opportunity to participate in lab-format activities that support the STEM ED 331 course.
Typically Offered: Summer.

STEM ED 342. Building Math. 3 Credits.
A course focused on the implementation of hands-on transdisciplinary investigations with project-based engineering design activities for middle school students. Algebraic thinking skills are emphasized through the collection and analysis of data to solve real problems as well as analysis and supplementation of available STEM education curricula.
Typically Offered: Summer.

STEM ED 355. STEM Curriculum and Methods for Elementary. 3 Credits.
Foundational course for fully implementing effective elementary-level STEM (Science, Technology, Engineering, and Mathematics) Education. Reviews and explores current trends in STEM Education; standards-based education and backward design; integration of content; evolution, philosophy, purpose, methods, and standards of STEM disciplines; and interdisciplinary methods for successfully engaging students and achieving STEM literacy.
Typically Offered: Spring.

STEM ED 411. STEM Curriculum and Methods. 3 Credits.
The study of the history and evolution of technology education from the 19th century to the current standards movement. Methods and management techniques appropriate to the technology education laboratory are studied including the management of student organizations.
Typically Offered: Fall.

STEM ED 431. Design for Engineering. 2 Credits.
An orientation and exposure to the careers and challenges of engineering and other STEM fields. Major engineering concepts included are modeling,systems, optimization, technology-society interaction, design and ethics.
Typically Offered: Fall.

STEM ED 431L. Design for Engineering Lab. 1 Credit.
An opportunity to participate in lab-format activities that support the STEM ED 431 course.
Typically Offered: Fall.

STEM ED 450. Engineering the Future. 3 Credits.
A course focused on concepts in physics, mathematics, and the engineering design process while exploring the social, historical, and environmental contexts of current and emerging technologies. Students develop a practical understanding of society's influence on the development of technology and the importance of technological literacy for everyone.
Typically Offered: Spring.

STEM ED 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.

TECH 161. Technology, Engineering, and Design. 4 Credits.
An introductory course that examines the engineering design process and its use to solve technological challenges. The course will cover the nature of technology, technology systems, and the history, evolution, and characteristics of technology, as well as learning activities to apply technology, science, and mathematics concepts.
Typically Offered: Fall, Spring.

TECH 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.

TECH 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.

TECH 300. 3D Modeling and Design. 2 Credits.
An introduction to the engineering design process, and the principles of graphics and 3D parametric modeling in the creation and visualization of engineering designs. SolidWorks modeling software is used to illustrate parametric 3D part modeling, assembly modeling, rendering, and production of working drawings from design ideas.
Typically Offered: Fall, even years.

TECH 300L. 3D Modeling and Design Lab. 1 Credit.
An opportunity to participate in lab-format activities that support the TECH 300 course.
Typically Offered: Fall, even years.

TECH 330. Exploring Technology. 2 Credits.
A course designed to prepare prospective teachers to teach technology concepts in middle school. Students explore the widest possible range of technologies and their impact on society, including the most significant developments of the modern world.
Typically Offered: Spring.

TECH 330L. Exploring Technology Lab. 1 Credit.
An opportunity to participate in lab-format activities that support the TECH 330 course.
Typically Offered: Spring.

TECH 356. Safety and Management in Technical Education. 3 Credits.
An examination of safety issues utilizing a systems-based team approach to ensure a safe technical education classroom or laboratory. The course covers essential discussions of inherent hazards, machine tool operations, as well as laboratory systems and management issues. By completing all elements of the course the student will produce materials required for a well-documented safety program.
Typically Offered: Spring.

TECH 371. Technology Systems. 2 Credits.
A focus on content and processes associated with technological systems with a middle school emphasis. Students apply systems concepts to design and problem solving activities.
Typically Offered: Spring.

TECH 371L. Technology Systems Lab. 1 Credit.
An opportunity to participate in lab-format activities that support the TECH 371 course.
Typically Offered: Spring.

TECH 391. Foundations of Technology. 2 Credits.
An exploration of the foundations of technology. Through group and activities based on science, mathematics, and engineering in a secondary education setting. Creating ideas, developing innovations, and engineering practical solutions are explored.
Typically Offered: Fall, odd years.

TECH 391L. Foundations of Technology Lab. 1 Credit.
An opportunity to participate in lab-format activities that support the TECH 391 course.
Typically Offered: Fall, odd years.

TECH 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.

TECH 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.

TECH 416. Innovations in Technology. 2 Credits.
A focus on how the student applies his or her knowledge and research to areas of mass production, manufacturing, resources, management, marketing of inventions and innovations, analytical thinking, decision-making, and continuous design improvements are emphasized.
Typically Offered: Fall.

TECH 416L. Innovations in Technology Lab. 1 Credit.
An opportunity to participate in lab-format activities that support the TECH 416 class.
Typically Offered: Fall.

TECH 456. Intelligent Machines. 2 Credits.
A focus on practical interfacing of computers to peripheral devices such as digital cameras, scanners, printers, storage devices, robots, actuators, motors, black boxes, and data capture probes. Commercial software components are also explored.
Typically Offered: On sufficient demand.

TECH 456L. Intelligent Machines Lab. 1 Credit.
Activities in a lab format that support the TECH 456 course.
Typically Offered: On sufficient demand.

TECH 478. Technology Assessment. 2 Credits.
Familiarizes the student with issues surrounding technology assessment in a secondary school including the need for assessment, the role of the citizen, the role of the expert, the role of the government, the strengths and limitations of assessment.
Typically Offered: Spring, odd years.

TECH 478L. Technology Assessment Lab. 1 Credit.
An opportunity to participate in lab-format activities that support the TECH 478 course.
Typically Offered: Spring, odd years.

TECH 491. Senior Portfolio. 1 Credit.
A course to assist the student in developing the digital portfolio used to assess the completion of the program outcomes. The course addresses both technical application and content and allows the student to demonstrate program outcome competencies.
Typically Offered: Fall, Spring.
Grading: S/U only.

TECH 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.

TECH 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.