



STEM Education (STEM ED)

Courses

STEM ED 650. STEM Curriculum and Methods. 3 Credits.

This course is designed to help graduate students understand how to properly use standards when developing curriculum. An emphasis is placed on the Standards for Technological and Engineering Literacy (STEL), including the use of the STEL eTool and Lesson Planning Tool, as well as the Understanding by Design (UbD) planning template. The curriculum development practices are designed to support teaching methods that support student learning in a STEM and Technology Education environment.

Typically Offered: Fall.

STEM ED 655. STEM Curriculum and Methods in Elementary. 3 Credits.

An overview for elementary teachers of the evolution, philosophy, methods, character, and purpose of each of the STEM disciplines. The course includes contemporary strategies unique and common among the disciplines such as analysis, modeling, inquiry, design, thematic instruction, team challenges, and practical problem solving. Current forces and trends acting on STEM education will also be explored. The overlay between STEM education and Gifted Education curriculum and methods will be emphasized.

Typically Offered: Fall.

STEM ED 660. Design for Engineering. 3 Credits.

Emphasizes advanced concepts related to the Engineering Design Process (EDP) and curriculum development, including the production of Teacher Materials, Student Materials, Assessments, and Course Outlines. This course provides a systematic understanding of the design process, which is a cornerstone of the Standards for Technological Literacy (STEL).

Typically Offered: Fall.

STEM ED 665. Invention and Innovation. 3 Credits.

A study of the concepts related to engineering design as well as concepts surrounding inventions and innovations. This course covers the standards, benchmarks, content, and techniques necessary to successfully create instructional materials for project-based units related to Invention and Innovation.

Typically Offered: Summer.

STEM ED 670. Design, Technology, and Engineering for Elementary. 3 Credits.

A course focused on creating standards-based thematic units at the elementary level using the engineering design process and design challenges to integrate science, mathematics, and other subject areas. A primary goal of the course is to expand the range of activities implemented in the elementary classroom, while meeting the specific needs of Gifted and Talented students and fostering technological literacy in all elementary students.

Typically Offered: Spring.

STEM ED 671. Inquiry Based Thematic Instruction. 3 Credits.

A course focused on the use of scientific inquiry, mathematics concepts, the engineering design process, design challenges, and additional subject areas in the implementation of standards-based thematic STEM and Gifted and Talented education units at the elementary level. Emphasis is also placed on evaluating and enhancing available thematic STEM and Gifted and Talented education curricula.

Typically Offered: Fall.

STEM ED 680. Building Math. 3 Credits.

A course focused on hands-on activities that integrate engineering design while developing algebraic thinking skills through the collection and analysis of data used to solve real-world problems. Students will develop the ability to apply math knowledge and concepts to their investigations and use the engineering design process. Suitable for secondary and middle school level teachers; and will provide opportunities to create standards-based materials in STEM for all students, while meeting the specific needs of Gifted and Talented students.

Typically Offered: Summer.

STEM ED 682. Engineering the Future. 3 Credits.

Emphasizes advanced concepts related to Green Design and curriculum development, including the production of Teacher Materials, Student Materials, Assessments, and Course Outlines. This course provides a systematic understanding of architectural, engineering, and construction design to successfully teach a green building project using the Standards for Technological Literacy (STEL). Utilizes text and materials from the Design a Green Building Engineering the Future course guide produced by the Boston Museum of Science.

Typically Offered: Spring.



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

STEM ED 699. Special Topics. 1-4 Credits.

An advanced study covering topics not regularly taught in the Master of education program. The course provides learners with the flexibility to investigate topics of interest.

Typically Offered: On sufficient demand.

Repeatable: Up to 12 Credits.