

# CHEMISTRY

## Master of Science - Chemical Education specialization from South Dakota State University

### OVERVIEW

This program is designed for in-service science teachers with a valid teacher's license to provide the majority of the coursework online. The completion of this program requires 32 graduate level credits with 23 offered via distance learning and nine credits completed at SDSU's main campus in Brookings, SD. The summer semester courses consist of an action research course, and a problem-based classroom application course delivered at SDSU during the two consecutive summers students are enrolled in the program.

### COURSE BREAK DOWN

**CHEM 610, 611, 612, 613, 614 and 615** are content courses developed to align high school AP curriculum concepts with topics taught in the core curriculum for SDSU Masters degree students. Participants develop deeper understandings of topics important to high school courses while gaining insight into applications of these topics.

**CHEM 616** participants are required to successfully complete two, 2-week summer sessions (two different summers) working with SDSU chemistry and biochemistry faculty, developing laboratory activities for their classrooms. These activities are based on current research being conducted by the department's faculty.

**CHEM 617** engages participants in conversations about the use of strategies in the classroom to collect, analyze and report data for the purpose of teaching their course. Participants are required to conduct a problems-based classroom application. This course discusses methods to conducting this activity.

**CHEM 618** encourages participants to discuss and practice alternative teaching strategies in chemistry. The course is designed to share techniques utilized in the classroom and practice methods to enhance classroom learning.

**CHEM 788** involves the development, implementation and reporting the results of a problem based classroom application in the participant's classroom. This course is taken twice; the first for one credit while designing and the second time for two credits while implementing. The application and report are provided to the participants MS degree committee and are defended orally as the Capstone portion of the program.

### ONLINE COURSES (CREDITS)

CHEM 610 Atomic Theory & Bonding (3)  
CHEM 611 Intermolecular Interactions & Phases of Matter (3)  
CHEM 612 Thermodynamics (3)  
CHEM 613 Equilibria & Acid-Base Chemistry (3)  
CHEM 614 Kinetics, Nuclear & Electrochemistry (3)  
CHEM 615 Organic & Biochemistry (3)  
CHEM 618 Chemistry Teaching Strategies (3)  
CHEM 788 Problem-based Classroom Application (1st time) (2)

### FIRST SUMMER FOR TWO WEEKS AT SDSU (CREDITS)

CHEM 616 Laboratory Development (must be taken twice) (3)  
CHEM 617 Action Research in the Secondary Classroom (2)

### SECOND SUMMER FOR TWO WEEKS AT SDSU (CREDITS)

CHEM 616 Laboratory Development (must be taken twice) (3)  
CHEM 788 Problem-Based Classroom Application (must be taken twice) (1)

**Projected Timeline for Master of Science - Chemical Education specialization**

Fall 2010	Spring 2011	June 2011	Fall 2011	Spring 2012	June 2012	Fall 2012
CHEM 610 CHEM 611	CHEM 612 CHEM 618	CHEM 616 CHEM 617	CHEM 614 CHEM 615	CHEM 613	CHEM 616 CHEM 788	CHEM 788



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