



**SOUTH DAKOTA BOARD OF REGENTS
ACADEMIC AFFAIRS FORMS**

New Course Request

SDSU	College of Natural Sciences / Department of Chemistry, Biochemistry and Physics
Institution	Division/Department
Dennis D. Hedge	4/16/2025
Institutional Approval Signature	Date

Section 1. Course Title and Description

Prefix & No.	Course Title	Credits
CHEM 786	Chemical Demonstrations in the Classroom - Chemical Properties	1

Course Description

This course focuses on how to use demonstrations in and beyond a chemistry classroom. Explore new demonstrations being promoted for chemistry classrooms and outreach. The overall goal is to provide participants with information about how to create and set up the necessary equipment and chemicals for the demonstration. An important objective is to discuss the chemistry that will be demonstrated and how that information can drive engagement in the classroom and outreach efforts.

Pre-requisites or Co-requisites

Prefix & No.	Course Title	Pre-Req/Co-Req?
None		

Registration Restrictions

None

Section 2. Review of Course

2.1. Will this be a unique or common course?

Unique Course

Prefix & No.	Course Title	Credits
ED 609	Contemporary Issues in Science Education	2
SEED 413-513	7-12 Science Methods	3

Provide explanation of differences between proposed course and existing system catalog courses below:

No existing course focuses on how to use demonstrations in a chemistry classroom.

ED 609 Contemporary Issues in Science Education highlights current issues in science education, the role of inquiry in science learning, and what research says about improving student outcomes. The course will provide an introduction to K-12 science content and process standards and raise awareness of potential benefits, challenges, and the research base associated with multiple pedagogical strategies. Participants will gain an understanding of the components needed to create a learning environment that encourages and supports all children in building understandings, making connections, and conducting scientific investigations.

In SEED 413-513 7-12 Science Methods students develop an understanding of the tools of inquiry of 7-12 sciences; the ability to design, deliver, and evaluate a variety of instructional strategies and processes that incorporate learning resources, materials, technologies, and state and national curriculum standards appropriate to 7-12 science, the ability to assess student

learning in 7-12 science; and to apply these knowledge, skills, and attitudes to real life situations and experiences.

The content of SEED 413 and ED 609 are very generally focused on pedagogy rather than the active-learning focus that using chemical demonstrations can have in a classroom. The proposed course, CHEM 786, is for high school teachers to gain a better understanding of how to perform and use chemical demonstrations as an effective learning tool in the classroom.

Section 3. Other Course Information

3.1. Are there instructional staffing impacts?

No. Schedule Management, explain below: Workload is available to offer this course. It will be offered during the summer in a rotation with CHEM 785. This course has been taught as CHEM 691. This request assigns the course a permanent course title and number.

3.2. Existing program(s) in which course will be offered: Chemistry (M.S.) – Chemistry Education Specialization

3.3. Proposed instructional method by university (as defined by [AAC Guideline 2.4.3.A](#)): D - Discussion

3.4. Proposed delivery method by university (as defined by [AAC Guideline 2.4.3.B](#) and [2.4.3.B\(A-1\)](#)): X29 – Hybrid Online

3.5. Term change will be effective: Fall 2025

3.6. Can students repeat the course for additional credit? Yes, total credit limit: No

3.7. Will grade for this course be limited to S/U (pass/fail)? Yes No

3.8. Will section enrollment be capped? Yes, max per section: 20 No

3.9. Will this course equate (i.e., be considered the same course for degree completion) with any other unique or common courses in the common course system database in Colleague and the Course Inventory Report? Yes No

3.10. Is this prefix approved for your university? Yes No

Section 4. Department and Course Codes (Completed by University Academic Affairs)

4.1. University Department: Department of Chemistry, Biochemistry and Physics

4.2. Banner Department Code: SCBP

4.3. Proposed CIP Code: 40.0501

Is this a new CIP code for the university? Yes No

NEW COURSE REQUEST Supporting Justification for On-Campus Review

Melody Jewell	Melody Jewell	2/24/2025
Request Originator	Signature	Date
Brian Logue	Brian Logue	2/25/2025
Department Chair	Signature	Date
Greg Heiberger	Greg Heiberger	3/7/2025
School/College Dean	Signature	Date

1. Provide specific reasons for the proposal of this course and explain how the changes enhance the curriculum.

Student engagement is an important part of the learning process, especially at the K-12 level. Learning is an active, not a passive process and sometimes requires “eye-catching” events to draw students into asking and answering questions like “why does that happen?” using solid scientific principles. No such course exists in the catalog which addresses how to use chemical demonstrations, not only as the “hook” to get students interested, but also to help students identify misconceptions and learn the science behind the phenomena they observe. This course aims to address a need for high school teachers who teach chemistry but may not be comfortable with or may not know how to effectively harness chemical demonstrations to enhance student learning. The course is designed to

provide additional knowledge for students in the M.S. in Chemistry with a specialization in Chemistry Education, as well as other high school teachers nationwide, to gain additional knowledge so they can:

- Set up various chemical demonstrations in their classroom.
- Safely conduct those demonstrations in their classroom.
- Explain the science (chemistry, physics, biology, geology...) behind the demonstration.
- Use the demonstration in your classroom to engage students in the learning process.

Given that students in this program are located across the country, the course will be offered in a flexible format to accommodate both remote and local teachers. Participation in the Chemical Demonstrations in the Classroom - Physical Properties course has been high among program and non-program participants, so this second offering intends to expand the demonstrations beyond the more common ones and focus, not only on the act of the demonstration itself, but also on the set-up and the integration of the demonstrations into teaching science. It will be delivered in a Hybrid Online modality during the summer semester where there will be both distance-learning components and options for in-person components. This course has been taught as CHEM 691. This request assigns the course a permanent course title and number.

2. Note whether this course is: Required Elective
3. In addition to the major/program in which this course is offered, what other majors/programs will be affected by this course?
None
4. If this will be a dual listed course, indicate how the distinction between the two levels will be made.
N/A
5. Desired section size 20
6. Provide qualifications of faculty who will teach this course. List name(s), rank(s), and degree(s).
Matthew Miller, Professor, Ph.D.
7. Note whether adequate facilities are available and list any special equipment needed for the course.
No special resources or facilities are required to teach this course.
8. Note whether adequate library and media support are available for the course.
Available support is adequate.
9. Will the new course duplicate courses currently being offered on this campus? Yes No
10. If this course may be offered for variable credit, explain how the amount of credit at each offering is to be determined.
N/A