SOUTH DAKOTA BOARD OF REGENTS
ACADEMIC AFFAIRS FORMS

New Course Request

USD	Arts & Sciences/Chemistry
Institution	**Division/Department**
Elizabeth M. Freeburg	2/20/2020
Institutional Approval Signature	**Date**

Section 1. Course Title and Description

Prefix & No.	Course Title	Credits
CHEM 728	Electronic Structure and Bonding	3

Course Description

This course provides both conceptual understanding of theories associated with chemical bonding and their applications to organometallic and materials chemistry. Major topics include electronic structure, molecular symmetry, chemical bonding, and reactivity.

Pre-requisites or Co-requisites None
Registration Restrictions None

Section 2. Review of Course

2.1. Was the course first offered as an experimental course?

☐ Yes *(if yes, provide the course information below)* ☒ No

2.2. Will this be a unique or common course (*place an "X" in the appropriate box*)?

If the request is for a unique course, verify that you have reviewed the common course catalog via Colleague and the system Course Inventory Report to determine if a comparable common course already exists. List the two closest course matches in the common course catalog and provide a brief narrative explaining why the proposed course differs from those listed. If a search of the common course catalog determines an existing common course exists, complete the Authority to Offer an Existing Course Form.

☒ **Unique Course**

Prefix & No.	Course Title	Credits
CHEM 752	Advanced Inorganic Chemistry (USD)	3
CHEM 744	Advanced Physical Chemistry (USD)	4
CHEM 770	Atomic Theory & Bonding (SDSU)	3

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

The proposed class complements CHEM752 and CHEM744, which are both part of the M.S. in Chemistry and the Ph.D. in Materials Chemistry. These required courses cover a small portion of topics in chemical bonding within their sub-discipline constraints (e.g., bonding in organometallic compounds). However, the following topics related to bonding are not covered: linear combinations of microstates for the description of symmetry adapted states in a non-spheric field, bonding in clusters, bonding in solids, magnetic materials, or the effects of bonding on properties such as optoelectronics. We aim to teach an in-depth understanding of chemical bonding and electronic structure that covers a wide range of molecules and materials. CHEM 770 taught at SDSU is a much simpler level of theory aimed at the preparation of secondary school teachers.

Section 3. Other Course Information

3.1. Are there instructional staffing impacts?

☒ **No**. Schedule Management, explain below:

The department will adjust the teaching rotation to accommodate the course offering once every other year.

3.2. Existing program(s) in which course will be offered: M.S. in Chemistry and Ph.D. in Materials Chemistry

3.3. Proposed instructional method by university: R - Lecture

3.4. Proposed delivery method by university: U01 Face-to-face

3.5. Term change will be effective: 202110

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: _____ ☒ 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 Code: UCHM

4.2. Proposed CIP Code: 40.0506

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