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

# New Course Request

| SDSU | Jerome J. Lohr College of Engineering / Mechanical Engineering |
|---|---|
| **Institution** | **Division/Department** |
| Dennis D. Hedge | 3/27/2019 |
| **Institutional Approval Signature** | **Date** |

## Section 1. Course Title and Description

| Prefix & No. | Course Title | Credits |
|---|---|---|
| ME 448 | Mechanical Behavior of Biomaterials | 3 |
| ME 548 | Mechanical Behavior of Biomaterials | 3 |

| Course Description |
|---|
| The course explores the field of biomaterials with a focus on response to static and dynamic forces, structure-property correlation, and experimental techniques for biomedical applications. Material topics include mammalian tissue (skin, artery, muscle, bone etc.), interaction with properties of implant materials (metal, polymer, ceramic etc.) and related regulatory issues in material selection and design for medical implants. Students will learn through literature review, case studies, homework, labs and projects. |

### ME 448 Pre-requisites or Co-requisites

| Prefix & No. | Course Title | Pre-Req/Co-Req? |
|---|---|---|
| ME 241 | Engineering Materials <u>or</u> Instructor Consent | Prerequisite |

### Registration Restrictions

| None |
|---|

## Section 2. Review of Course

**2.1. Was the course first offered as an experimental course?** ☐ Yes ☒ No

**2.2. Will this be a unique or common course?**

    ☒ **Unique Course**

| Prefix & No. | Course Title | Credits |
|---|---|---|
| ABE 343-343L | Engineering Properties of Biological Materials and Lab | 4 |
| BME 601 | Biomaterials | 3 |

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

| ABE 343-343L is focused on broad engineering properties (mechanical, physical, thermal, and electromagnetic variability) of biological materials including food, and plant and animal tissue from an agriculture industry perspective. The proposed new course is focused on response of mammalian tissues to static and dynamic forces and includes application of engineering principles in material selection, testing, analysis and design for medical implants. The proposed course is at the senior undergraduate/introductory graduate level.<br><br>BME 601 is a graduate course focused on properties of medical device and implant materials. The proposed new course is aimed at senior undergraduates and covers properties and response of tissues from a mechanical engineering perspective. |
|---|

## Section 3. Other Course Information
**3.1. Are there instructional staffing impacts?**

☒ No.  Schedule Management, explain below: This is a technical elective course, previously offered as special topics.  It will be offered in rotation with other technical electives with no net change in staffing required.

**3.2. Existing program(s) in which course will be offered:** Mechanical Engineering

**3.3. Proposed instructional method by university:** R - Lecture

**3.4. Proposed delivery method by university:** 001 – Face to Face Term Based Instruction

**3.5. Term change will be effective:** Fall 2019

**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: 10 undergraduates, 10 graduates ☐ 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:**   SME

**4.2. Proposed CIP Code:**  14.1901

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

## NEW COURSE REQUEST
## Supporting Justification for On-Campus Review

| Anamika Prasad | Anamika Prasad | 12/5/2018 |
|---|---|---|
| **Request Originator** | **Signature** | **Date** |

| Kurt Bassett | Kurt Bassett | 2/14/2019 |
|---|---|---|
| **Department Chair** | **Signature** | **Date** |

| Bruce Berdanier | *BLBerdanier* | 2/22/2019 |
|---|---|---|
| **School/College Dean** | **Signature** | **Date** |

1. Provide specific reasons for the proposal of this course and explain how the changes enhance the curriculum.
   Biomedical Engineering is a popular minor at SDSU, especially among mechanical engineering students. Biomedical engineering is a rapidly expanding field of study where engineers are applying their knowledge and expertise to improve human health and disease management through development of medical implants, biomedical devices, and artificial tissue and organs. This course offers students the opportunity to learn, apply, and retain multidisciplinary knowledge and skills, and apply mechanical engineering principles to address materials related questions in a rapidly growing field. This course was offered as a special topics ME 492/592 course at SDSU in fall 2017 and fall 2018.

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.
    Graduate students will be assigned separate exercises, more detailed presentations, and a compulsory final project requiring advanced analytical, research, and reporting skills.  These exercises will be used to evaluate graduate students differently from undergraduate students.

5.  Desired section size        10 graduates, 10 undergraduates

6.  Provide qualifications of faculty who will teach this course.  List name(s), rank(s), and degree(s).
    Anamika Prasad, Assistant Professor, Ph.D.
    Saikat Basu, Assistant Professor, Ph.D.

7.  Note whether adequate facilities are available and list any special equipment needed for the course.
    Current facilities are adequate for offering this course.  No additional facilities are required.

8.  Note whether adequate library and media support are available for the course.
    Adequate library and media support are available for this course.

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.
    NA