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	3/26/2018
Institutional Approval Signature	**Date**

Section 1. Course Title and Description

Prefix & No.	Course Title	Credits
ME 446	Engineering Mechanics in Biomedical Applications	3
ME 546	Engineering Mechanics in Biomedical Applications	3

Course Description

This course focuses on biomedical applications of the principles of engineering mechanics. The concepts of kinematics, dynamics, thermal-fluid system analysis, and transport phenomena are applied in developing engineering models of various aspects of anatomy and physiology and in the design of prosthetics and biomedical devices. Topics include biomechanics; engineering properties of biomaterials; computer applications in medicine; research and development in biomedical engineering; and ethics at the nexus of medicine and engineering.

ME 446 Pre-requisites or Co-requisites

Prefix & No.	Course Title	Pre-Req/Co-Req?
EM 331	Fluid Mechanics	Prerequisite
ME 321	Fundamentals of Machine Design	Prerequisite

ME 546 Pre-requisites or Co-requisites

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

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
PE 454-454L	Biomechanics and Lab	3
BME 607	Biomechanics	3

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

This course takes a mechanical engineering-focused perspective to the analysis and design of devices in the biomedical field. PE 454-454L is focused on motion of the human body from the standpoint of physical activity, exercise and sport. BME 607 is a graduate-only course and covers fundamental concepts rather than engineering and computer application of the concepts to design.

☐ **Common Course** *Indicate universities that are proposing this common course:*

☐ BHSU ☐ DSU ☐ NSU ☐ SDSMT ☐ SDSU ☐ USD

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, Biomedical Engineering Minor

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 2018

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 undergraduate, 5 graduate ☐ 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

Stephen Gent	Stephen Gent	12/8/2017
Request Originator	**Signature**	**Date**
Kurt Bassett	Kurt Bassett	1/23/2018
Department Chair	**Signature**	**Date**

Lewis Brown	Lewis Brown	1/23/2018
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 (BME) is a rapidly expanding field of study where engineers are applying their knowledge and expertise to developing technologies in the medical field. Examples include prosthetics, implantable medical devices, tissue engineering, and medical imaging, among others. This course provides students with the opportunity to see the latest advancements in the medical field and to see how engineering principles can be used to improve the lives of patients and caretakers. This course was offered as a special topics ME 492/592 course at SDSU for three semesters (Fall 2015, Fall 2016, and Fall 2017). Denoted as: SpTp-Engineer Mech Biomed Apl.
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 and projects requiring advanced analytical and reporting skills. These exercises will be used to evaluate graduate students differently from undergraduate students.
5. Desired section size 20 undergraduate, 5 graduate
6. Provide qualifications of faculty who will teach this course. List name(s), rank(s), and degree(s).
   Stephen Gent, Associate Professor, Ph.D.
7. Note whether adequate facilities are available and list any special equipment needed for the course.
   The 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
   If yes, provide justification.
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