Engineering Faculty Document No. 38-13
January 14, 2013

TO: The Faculty of the College of Engineering

FROM: The Faculty of the School of Biomedical Engineering

RE: Change to Undergraduate-Level Course BME 20400 prerequisite

The faculty of the School of Biomedical Engineering has approved the change in requisites of the course listed below. This action is now submitted to the Engineering Faculty with a recommendation for approval.

FROM: **BME 20400 Biomechanics of Hard and Soft Tissues**
Term offered: Spring, Lecture 3, Cr. 3
Prerequisite: ME 27000, BIOL 29500E, or equivalent
Corequisite: MSE 23000 or equivalent

Covers the mechanics of biological materials, with applications in the musculo-skeletal system, nerves, spinal cord, and vascular tissue, down to the level of the cell. Topics include center of mass, moment of inertia, basic understanding of stresses, strains, and deformations, axial elements, pressure vessels, beams, torsion, viscoelasticity, and thermal stress. Case studies and problem solving sessions used to emphasize the unique biological criteria which must be considered when mechanically analyzing both soft and hard tissues.

TO: **BME 20400 Biomechanics of Hard and Soft Tissues**
Term offered: Spring, Lecture 3, Cr. 3
Prerequisite: ME 27000 and BIOL 23000
Concurrent prerequisite: MSE 23000

Covers the mechanics of biological materials, with applications in the musculo-skeletal system, nerves, spinal cord, and vascular tissue, down to the level of the cell. Topics include center of mass, moment of inertia, basic understanding of stresses, strains, and deformations, axial elements, pressure vessels, beams, torsion, viscoelasticity, and thermal stress. Case studies and problem solving sessions used to emphasize the unique biological criteria which must be considered when mechanically analyzing both soft and hard tissues.

REASON: The biology prerequisite, BIOL 29500E, was changed because the class was given a permanent number; BIOL 23000.

George Wodicka
Professor and Head
Weldon School of Biomedical Engineering

APPROVED FOR THE FACULTY
OF THE SCHOOLS OF ENGINEERING
BY THE ENGINEERING
CURRICULUM COMMITTEE
ECC Minutes # 12
Date 4/19/2013
Chairman ECC

EFD 38-13

Office of the Registrar
FORM 40 REV. 11/09

PURDUE UNIVERSITY
REQUEST FOR ADDITION, EXPIRATION, OR REVISION OF AN UNDERGRADUATE COURSE
(10000-40000 LEVEL)

Print Form

DEPARTMENT Biomedical Engineering

EFFECTIVE SESSION Spring 2014 (201420)

INSTRUCTIONS: Please check the items below which describe the purpose of this request.

- [ ] 1. New course with supporting documents
- [ ] 2. Add existing course offered at another campus
- [ ] 3. Expiration of a course
- [ ] 4. Change in course number
- [ ] 5. Change in course title
- [ ] 6. Change in course credit/type
- [ ] 7. Change in course attributes (department head signature only)
- [ ] 8. Change in instructional hours
- [ ] 9. Change in course description
- [x] 10. Change in course requisites
- [ ] 11. Change in semesters offered (department head signature only)
- [ ] 12. Transfer from one department to another

PROPOSED:	EXISTING:
Subject Abbreviation	Subject Abbreviation BME
Course Number	Course Number 20400
Long Title Biomechanics of Hard and Soft Tissues	
Short Title Biomech Hard/Soft Tiss	

Abbreviated title will be entered by the Office of the Registrar if omitted. (30 CHARACTERS ONLY)

TERMS OFFERED
Check All That Apply:
☐ Summer ☐ Fall ☒ Spring

CAMPUS(ES) INVOLVED
☐ Calumet ☐ N. Central
☐ Cont Ed ☐ Tech Statewide
☐ Ft. Wayne ☒ W. Lafayette
☐ Indianapolis

CREDIT TYPE
1. Fixed Credit: Cr. Hrs. 3
2. Variable Credit Range: Minimum Cr. Hrs (Check One) To ☐ Or ☐ Maximum Cr. Hrs.
3. Equivalent Credit: Yes ☐ No ☐

COURSE ATTRIBUTES: Check All That Apply
1. Pass/Not Pass Only ☐
2. Satisfactory/Unsatisfactory Only ☐
3. Repeatable ☐
Maximum Repeatable Credit: ☐
4. Credit by Examination ☐
5. Special Fees ☐
6. Registration Approval Type: Department ☐ Instructor ☐
7. Variable Title ☐
8. Honors ☐
9. Full Time Privilege ☐
10. Off Campus Experience ☐

ScheduleType	Minutes Per Mtg	Meetings Per Week	Weeks Offered	% of Credit Allocated
Lecture				
Recitation				
Presentation				
Laboratory				
Lab Prep				
Studio				
Distance				
Clinic				
Experiential				
Research				
Ind. Study				
Pract/Obsery				

Cross-Listed Courses

RECEIVED
APR 23 2013
OFFICE OF THE REGISTRAR

COURSE DESCRIPTION (INCLUDE REQUISITES/RESTRICTIONS):
Term offered: Spring, Lecture 3, Cr. 3. Prerequisite: ME 27000 and BIOL 230. Concurrent prerequisite: MSE 23000. Covers the mechanics of biological materials, with applications in the musculo-skeletal system, nerves, spinal cord, and vascular tissue, down to the level of the cell. Topics include center of mass, moment of inertia, basic understanding of stresses, strains, and deformations, axial elements, pressure vessels, beams, torsion, viscoelasticity, and thermal stress. Case studies and problem solving sessions used to emphasize the unique biological criteria which must be considered when mechanically analyzing both soft and hard tissues.

*COURSE LEARNING OUTCOMES:
By the end of this course students should be able to:
1. Describe the concepts of stress, strain, and viscoelasticity and explain how these concepts apply to musculoskeletal tissues such as tendons, ligaments, cartilage, muscles and bone.
2. Infer the state of stress and strain at a given point in biomedical implants under torsional, axial, bending, and other types of loads.
3. Describe the structural hierarchical organization and physiology of musculoskeletal tissues; and how the mechanical function of these tissues alters with age, disease

Calumet Department Head	Date	Calumet School Dean	Date
Fort Wayne Department Head	Date	Fort Wayne School Dean	Date
Indianapolis Department Head	Date	Indianapolis School Dean	Date
North Central Department Head	Date	North Central Chancellor	Date
West Lafayette Department Head	Date	West Lafayette College/School Dean	Date

West Lafayette Registrar Date 5/14/13

OFFICE OF THE REGISTRAR

38-13
US 5/10/13