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.

[Signature]
George Wodicka
Professor and Head
Weldon School of Biomedical Engineering
PURDUE UNIVERSITY
REQUEST FOR ADDITION, EXPIRATION, OR REVISION OF AN UNDERGRADUATE COURSE
(10000-49999 LEVEL)

DEPARTMENT: Biomedical Engineering
EFFECTIVE SESSION: Spring 2014

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. Renew or extension of a course
4. Change in course number
5. Change in course title
6. Change in course credit hours
7. Change in course attributes (department head signature only)
8. Change in instructional time
9. Change in course description
10. Change in course prerequisites
11. Change in semester offered (department head signature only)
12. Transfer from one department to another

PROPOSED:

<table>
<thead>
<tr>
<th>Subject Abbreviation</th>
<th>Subject Abbreviation: BME</th>
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<tbody>
<tr>
<td>Course Number</td>
<td>Course Number: 20400</td>
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<tr>
<td>Long Title: Biomechanics of Hard and Soft Tissues</td>
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<tr>
<td>Short Title: Biomech Hard/Soft Tiss</td>
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Abbreviated title will be entered by the Office of the Registrar if omitted. (50 Characters Only)

TERMS OFFERED: Check All That Apply:
- [ ] Summer
- [ ] Fall
- [x] Spring

CAMPUS(ES) INVOLVED:
- [ ] Calumet
- [ ] Cent. Ed.
- [ ] Ft. Wayne
- [X] Tech Statewide
- [ ] Indianapolis
- [ ] W. Lafayette

CREDIT TYPE:
- [ ] Fixed Credit: Cr. Hrs: 3
- [ ] Variable Credit Range: Minimum Cr. Hrs: (Check One) To or Or Maximum Cr. Hrs: 3-Equivalent Credit: Yes [ ] No

COURSE ATTRIBUTES: Check All That Apply:
- [x] Pass/Not Pass Only
- [ ] Satisfactory/Unsatisfactory Only
- [ ] Repeatable
- [ ] Maximum Repeatable Credit:
- [ ] Credit by Examination
- [ ] Special Fee

Schedule Type
- Lecture
- Recitation
- Presentation
- Laboratory
- Lab Prep
- Studio
- Distance
- Clinic
- Experiential
- Research
- Ind Study
- Pract/Observer

Minutes Per Week  Meetings Per Week  Weeks Offered  % of Credit

Course Description (Include Requisites/Restrictions):
Term offered: Spring. Lecture 3. Cr. 3. Prerequisites: ME 27000 and BIOL 230. Concurrent prerequisite: MSE 23000. Covers the mechanics of biological materials, with applications in the musculoskeletal 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, tension, 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 load.
3. Describe the structural hierarchical organization and physiology of musculoskeletal tissues and how the mechanical function of these tissues affects with joint motion.

Column Department Head Date
Centre Department Head Date
Fort Wayne Department Head Date
Indianapolis Department Head Date
North Central Department Head Date
West Lafayette Department Head Date

OFFICE OF THE REGISTRAR

RECEIVED APR 2 3 2013

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