Office of the Registrar
FORM 40 REV. 2/99

PURDUE UNIVERSITY
REQUEST FOR ADDITION, DELETION, OR REVISION OF A COURSE

SCHOOL DOCUMENT NO. 6-04

GRADUATE COUNCIL DOCUMENT NO. _____

DEPARTMENT Biomedical Engineering DATE SUBMITTED 10/20/04 DATE EFFECTIVE 8/1/05

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

PURPOSE

	1. Deletion of a course	✓	8. Change in semesters offered
	2. New course with supporting documents		9. Change in course credit/type
	3. Add existing course offered at another campus		10. Change in course attributes
	4. Change in course number at same level		11. Change in instructional hours
	5. Downgrading of course level		12. Change in prerequisites
	6. Upgrading of course level		13. Change in description of course content
	7. Change in course title		14. Transfer of course from one dept. to another

EXISTING:	PROPOSED:
Subject Abbreviation BME	Subject Abbreviation
Course Number 583	Course Number
Proposed Title Biomaterials	
Variable Title Yes ☐ No ✓	
Abbreviated Title Biomaterials	

Abbreviated title will be entered by the Office of the Registrar if omitted. (22 CHARACTERS ONLY)

SEMESTERS OFFERED
Check All That Apply.

Summer	Fall	Ag Winter	Spring
☐	✓	☐	☐

CROSS LISTED COURSES

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 ☐
4. Thesis Credit: Yes ☐ No ☐

COURSE ATTRIBUTES: Check All That Apply.

1. Pass/Not Pass Only	☐
2. Repeatable for Credit	☐
3. Available for Credit by Examination	☐
4. Designator Required	☐
5. Special Fees	☐
6. Approval Required for Enrollment	
Department	✓
Instructor	✓

Instructional Type	Class Hours	FTE	Instructional Type	Class Hours	FTE	Instructional Type	Class Hours	FTE
Primary	3.0		Auto-tutorial			Thesis		
Secondary			Ind. Study			Observation		
Laboratory			Clinic			Matls Based		
Lab. Prep.			Experiential					

CAMPUS(ES) INVOLVED

Calumet	☐
Fort Wayne	☐
Indianapolis	☐
North Central	☐
West Lafayette	✓
Off Campus	☐

COURSE DESCRIPTION (PREREQUISITES INCLUDED):

Prerequisites: Permission of the instructor required. (Offered in alternate years.)
Course discusses principles of biomaterial design, synthesis, and evaluation for various tissues/organs of the body including orthopaedic/dental, cardiovascular, kidney, liver, lung, skin, nerve, and brain. Topics include fundamentals of materials science and engineering integrated into biology for the better regeneration of tissue.

Calumet Undergrad Curriculum Committee Date	Calumet Department Head Date	Calumet School Dean Date
Fort Wayne Department Head Date	Fort Wayne School Dean Date	Fort Wayne Chancellor Date
Indianapolis Department Head Date	Indianapolis School Dean Date	Undergrad Curriculum Committee Robert E Montgomery 1/13/05 Date
North Central Department Head Date	North Central Vice Chancellor Date	Date Approved by Graduate Council
West Lafayette Department Head 1/11/05 Date	West Lafayette School Dean 1/20/05 Date	Graduate Council Secretary Date
Graduate Area Committee Convener Date	Graduate Dean Date	West Lafayette Registrar Date

OFFICE OF THE REGISTRAR

TO: The Engineering Faculty
FROM: Department of Biomedical Engineering
RE: Permanent Dual Level Course Number

The Department of Biomedical Engineering has approved the following course change. This action is now submitted to the Engineering Faculty with a recommendation for approval.

From:
BME 583 Biomaterials Sem. 2. Class 3, cr. 3. (Offered in alternate years.) Prerequisites: Permission of the instructor required

Course discusses principles of biomaterial design, synthesis, and evaluation for various tissues/organs of the body including orthopaedic/dental, cardiovascular, kidney, liver, lung, skin, nerve, and brain. Topics include fundamentals of materials science and engineering integrated into biology for the better regeneration of tissue.

To:
BME 583 Biomaterials Sem. 1. Class 3, cr. 3. (Offered in alternate years.) Prerequisites: Permission of the instructor required

Course discusses principles of biomaterial design, synthesis, and evaluation for various tissues/organs of the body including orthopaedic/dental, cardiovascular, kidney, liver, lung, skin, nerve, and brain. Topics include fundamentals of materials science and engineering integrated into biology for the better regeneration of tissue.

Reason: Biomedical Engineering is beginning to offer undergraduate courses and due to the distribution of the teaching load we request a change of semester for the course offering.

George R. Wodicka
Professor and Head

APPROVED FOR THE FACULTY
OF THE SCHOOLS OF ENGINEERING
BY THE COMMITTEE ON
FACULTY RELATIONS

CFR Minutes 996

Date 11-30-04

Chairman CFR Robert E Montgomery

Biomaterials

Supporting Documentation:

Course Instructor: Tom Webster

Offered: fall semester (even years)

Credit: 3

Course Objective:
To integrate materials science and engineering concepts with biology to educate students how to design successful biomaterials.

3. SYLLABUS:

Topics	No. of Lectures
Introduction to course	1
Structure of solids	3
Atomic bonding, crystal structure, imperfections	
Characterization of materials	4
Mechanical properties, stress-strain behavior	
Viscoelasticity, thermal properties, phase diagrams	
Strengthening mechanisms, surface properties	
Metallic implant materials	3
Ceramic implant materials	3
Polymeric implant materials	4
Composites as biomaterials	2
Structure-property relationships in biology	3
Proteins, polysaccharides, mineralized tissue: bone/dentin	
Organ Transplants	3
Tissue response to biomaterials	7
Normal wound healing process, body response to implants	
Cell response to biomaterials	8
Protein mediated cell adhesion	
Student Presentations	3
Total	44

4. SUGGESTED REFERENCE AND/OR TEXTBOOKS:

1. Park JB and Lakes RS: Biomaterials an Introduction. Plenum Press, New York, 1992.
2. Ratner BD, Hoffman AS, Schoen FJ, Lemons JE: Biomaterials Science: An Introduction to Materials in Medicine. Academic Press, New York, 1996.
3. Hudson JB: Surface Science. Butterworth-Heinemann, Boston, 1992.
4. Simon SR: Orthopaedic Basic Science. American Academy of Orthopaedic Surgeons, Rosemont, IL, 1994.
5. Fung YC: Biomechanics: Mechanical Properties of Living Tissues. Springer-Verlag, New York, 1993.
6. Guyton AC and Hall JE: Textbook of Medical Physiology. W.B. Saunders Company, Philadelphia, 1996.

5. DOCUMENTATION ON PREVIOUS COURSE OFFERINGS:

	Fall 1999	Fall 2001	Fall 2003
Total Number of Students Enrolled	10	14	17
Total BME Students Enrolled	4	13	12
Course Evaluation	4.1/5.0	4.5/5.0	4.8/5.0