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Office of the Registrar
FORM 40 REV. 2/99

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

SCHOOL DOCUMENT NO. 40-01

GRADUATE COUNCIL DOCUMENT NO. 05-2b

DEPARTMENT Biomedical Engineering DATE SUBMITTED 12/9/04 DATE EFFECTIVE Fall ~~05~~ 2005

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:
Subject Abbreviation ~~BME~~
Course Number ~~551~~

PROPOSED:
Subject Abbreviation BME
Course Number ~~595~~ 551

Proposed Title Tissue Engineering
Variable Title Yes [ ] No [✓]

SEMESTERS OFFERED
Check All That Apply.
Summer [ ] Fall [✓] Ag Winter [ ] Spring [ ]

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

CROSS LISTED COURSES
BMS 523

CREDIT TYPE
1. Fixed Credit: Cr. Hrs. 3.0
2. Variable Credit Range:
   Minimum Cr. Hrs
   (Check One) To [ ] Or [ ]
   Maximum Cr. Hrs.
3. Equivalent Credit: Yes [ ] No [X]
4. Thesis Credit: Yes [ ] No [X]

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 [X]

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): Admission by consent of instructor.

Integrates the principles and methods of engineering and life sciences toward the fundamental understanding of structure-function relationships in normal and pathological mammalian tissues, especially as they relate to the development of biological substitutes to restore, maintain, or improve tissue/organ function. Current concepts and strategies,including drug delivery, tissue and cell transplantation, bioartificial organs, and in vivo tissue regeneration are introduced, as well as their respective clinical applications. Professor Voytik-Harbin.

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	[signature] Undergrad Curriculum Committee	12/13/04 Date
[signature] ~~North Central~~ Department Head	12/21/04 Date	North Central Vice Chancellor	Date	APPROVED 2/17/05 Date Approved by Graduate Council	
[signature] West Lafayette Department Head	12/10/04 Date	[signature] West Lafayette School Dean	12/10/04 Date	[signature: Marilyn D. Geist] Graduate Council Secretary	5/9/05 Date
[signature] Graduate Area Committee Convener	2/17/05 Date	[signature] Graduate Dean	12/22/04 Date	[signature: Debra K. Sheets] West Lafayette Registrar	Date

OFFICE OF THE REGISTRAR MAY 18 2005

Engineering Faculty Document #40-01
March 6, 2002

To: Faculty of the Schools of Engineering

From: Department of Biomedical Engineering

Subject: New Graduate Level Course

The Department of Biomedical Engineering has approved the following new course. Approval of the Faculty of the Schools of Engineering is requested.

BME 551/ BMS 523 Tissue Engineering

A. Course Description
Sem. 2, Class 3, cr. 3

Interdisciplinary approach to structure-function relationships of normal and pathological tissues and development of strategies to restore, maintain, or improve tissue function. Concepts and strategies include drug delivery, biomaterials, biomechanics, in vivo tissue regeneration.

B. Reason

This course has been offered three times on an experimental basis and has received high level of interest from both undergraduate and graduate students representing multiple academic departments. This course provides students with a truly interdisciplinary and integrated perspective of the engineering, life science, and clinical principles and practices involved in the development of medical devices and tissue/organ substitutes. The student is taught the important biophysical and biological aspects of various tissue/organs as well as the cutting-edge tissue engineering strategies used to repair and restore their structure and function.

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

CFR Minutes # 962

Date 4/26/02

Chairman CFR C. D. Sitton

George R. Wodicka
Head and Professor
Department of Biomedical Engineering

Supporting Documentation:

Coordinating Instructors: S.L. Voytik-Harbin (W. Lafayette) and D. Stocum (Indianapolis)

Course Objective:

This course integrates the principles and methods of engineering and life sciences toward the fundamental understanding of structure-function relationships in normal and pathological mammalian tissues especially as they relate to the development of biological substitutes to restore, maintain, or improve tissue/organ function. Current concepts and strategies including drug delivery, tissue and cell transplantation, bioartificial organs, and in vivo tissue regeneration are introduced as well as their respective clinical applications.

Student Population:

The student population will consist of undergraduate (seniors) and graduate students from engineering, bioengineering, and life science disciplines. It is likely that this will be the first exposure to interdisciplinary topics for many of the students. Supplementary reading materials will be suggested for those students who may feel they are deficient in certain areas.

Course Format:

The course will be a live video-conference between classrooms in Indianapolis and West Lafayette so there is no need for extensive travel.

Course Content:

LECTURE	TOPIC
1	Course Introduction; Tissue Engineering and Regenerative Biology: A Perspective
	TISSUE DEVELOPMENT, REGENERATION, AND REPAIR
2	Basic Concepts of Tissue Development and Regeneration
3	Phases of Tissue Repair
4	Fetal vs. Adult Wound Healing; Chronic Wounds
	CELLULAR PROCESSES AND TISSUE RESTORATION: A QUALITATIVE AND QUANTITATIVE APPROACH
5	Cell Proliferation, Cell Differentiation
6	Cell Migration, Cell Adhesion; Receptor/Ligand Binding
	EXTRACELLULAR MATRIX AND TISSUE RESTORATION
7	Compositional and Structural Aspects of Extracellular Matrix (ECM); Collagen
8	Glycosaminoglycans; Proteoglycans; Growth Factors and Other Molecular Mediators of ECM

	BIOPHYSICAL ASPECTS OF TISSUE RESTORATION
9	Mechanical Aspects of Tissue Restoration
10	Mechanical Aspects of Tissue Restoration
11	Electrical Phenomena and Tissue Restoration
	STRATEGIES IN TISSUE ENGINEERING AND RECONSTRUCTION
12	Biomaterials
13	Cell Transplantation; Stem Cells; Gene Therapy
14	Bioartificial Organs
15	Regeneration In Vivo, Stimulation of Regeneration in Vivo
16	Tissue Transplantation (autografts, allografts, xenografts)
17	Drug Delivery
18	Exam
	ENGINEERING AND RESTORATION OF SPECIFIC ORGAN/TISSUE SYSTEMS
19	Skin
20	Oral Tissues
21	Cardiovascular System: Vascular Grafts
22	Cardiovascular System: Cardiac Prostheses
23	Nervous System: Peripheral Nervous Tissue
24	Nervous System: Spinal Cord
25	Musculoskeletal System: Cell and Molecular Engineering of Musculoskeletal System
26	Musculoskeletal System: Bone and Cartilage, Tendon and Ligament
27	REGULATORY ASPECTS OF TISSUE RESTORATION
28	Case Studies
29	Case Studies
30	Exam