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

PURPOSE

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

EXISTING:

Subject Abbreviation: BME
Course Number: 695

PROPOSED:

Subject Abbreviation: BME
Course Number: 656

Proposed Title: Confocal Microscopy

Variable Title: Yes [ ] No [x]

Abbreviated Title: Confocal Microscopy

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

CROSS LISTED COURSES

<table>
<thead>
<tr>
<th>Course</th>
<th>Type</th>
<th>Hours</th>
<th>FTE</th>
</tr>
</thead>
<tbody>
<tr>
<td>BMS</td>
<td>656</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

COURSE DESCRIPTION (PREREQUISITES INCLUDED):

Theory and application of cellular and molecular imaging technologies including confocal and multi-photon microscopy. Optics, electronics, data collection, and visualization techniques. Collection and analysis of 2D and 3D image sets from various biological specimens.

SEMMETERS OFFERED

Check All That Apply.

- Summer
- Fall
- Ag Winter [x]
- Spring

CAMPUS(ES) INVOLVED

- Calumet
- Fort Wayne
- Indianapolis
- North Central
- West Lafayette [x]
- Off Campus

OFFICE OF THE REGISTRAR
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 656 / BMS 634 Confocal Microscopy: Techniques and Application Module

A. Course Description

Sem. 2, Class 3, Lab 8, cr. 2 (5 wks)  
Prerequisite: Permission of the Instructor Required  

Theory and application of cellular and molecular imaging technologies including confocal and multi-photon microscopy. Optics, electronics, data collection, and visualization techniques. Collection and analysis of 2D and 3D image sets from various biological specimens.

B. Reason

This course has been offered three times on an experimental basis and has received a high level of student interest. In this course, students are introduced to the fundamental biophysical and optical basis of state-of-the-art imaging technologies including confocal microscopy. The course provides students with hands-on experience and practical knowledge regarding the application of such imaging technology for the study of physiological systems and processes.

[Signature]
George R. Wodicka  
Head and Professor  
Department of Biomedical Engineering
Supporting Documentation:

Instructor: J.Paul Robinson

Technical Assistant: Jennie Sturgis

Course Objectives:

This module will bring the latest cellular and molecular imaging technologies to the student's attention by allowing them to actually participate in using a confocal microscope. Confocal microscopy is a technology whereby a laser optically sections material and a data set is produced such that the material can be visualized in 3 dimensions. The lecture will give the students a good background in optics, electronics, data collection as well as visualization techniques. In addition, the students will have the opportunity to utilize fluorescence- and confocal- based instrumentation for the collection and analysis of 2D and 3D images of various materials.

Course Content:

Week 1: Light and fluorescence microscopy
Week 2: Fluorescence and transmitted light images with the confocal
Week 3: 3D image collection and processing
Week 4: Reflection imaging and multi-wavelength acquisition
Week 5: Time-lapse and live cell imaging