Florida Institute of Technology

ADDING A NEW COURSE TO THE CURRICULUM

This course is available for student registration only after the approval process has been completed.

SUBJECT B M E COURSE NO.* 4 3 2 0 CREDIT HOURS 3 TERM TO BE ADDED TO THE FILE Fall 2014
*(e.g., CSE) (e.g., 1301)

CLASS HOURS LECTURE HOURS 30 LAB HOURS 30 CONTACT HOURS (CEU ONLY)

DEPARTMENT Biomedical Engineering SCHEDULE TYPE Lecture & Lab
*(e.g., Computer Sciences) *(e.g., Lecture, Lab or Special Topics/Project)

☐ COLLEGE OF AERONAUTICS – 23 ☐ COLLEGE OF PSYCHOLOGY AND LIBERAL ARTS – 25
☐ NATHAN M. BISK COLLEGE OF BUSINESS – 24 ☐ COLLEGE OF SCIENCE – 26
☒ COLLEGE OF ENGINEERING – 1 ☐ EXTENDED STUDIES DIVISION / NATHAN M. BISK COLLEGE OF BUSINESS – 90

COMPUTER TITLE Restricted to 25 characters, including spaces Eng/Clin Apps in Medicine Dual-Prefix, Bi-Level, Full Load? ☐ Yes ☒ No

CATALOG TITLE Engineering and Clinical Applications in Medicine

CATALOG DESCRIPTION OF COURSE Restricted to 350 characters, including spaces

Exposes junior and senior undergraduates in biomedical engineering and premedical sciences to global issues in healthcare. Focuses on medical devices and their proper use in the clinical setting. Emphasizes devices used to improve patient outcomes and reduce cost. Includes new technology trends in various venues through labs and lectures.

This description has been approved by the catalog office 8/21/13

Catalog Director Date

In addition, please attach a course syllabus and/or more detailed description.

Restrictions ☐ Prerequisite ___________ Course Number ___________ ☐ Corequisite ___________ Course Number ___________

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GRADING TO BE ISSUED ☒ A, B, C, D, F ☐ A, B, C, D, F, CEU/Audit ☐ CEU ☐ S, U ☐ P, F ☐ Other

ADDITIONAL RESTRICTION (Requirements: Junior standing, advisor approval, instructor approval.)

(e.g., Major, Class Level, Department Head Approval)

If this course replaces a course currently offered in BANNER, please indicate old course information and the date/term the course may be removed from the system.

SUBJECT Prefix (e.g., CSE) ___________ COURSE NO. (e.g., 1301) ___________ TERM TO INACTIVATE ___________

☐ Yes ☒ No Will this course be used to measure program-level student learning outcomes?

If yes, associate vice president for institutional compliance requires approval:**

APPROVALS: On completion of description and course number verification, affix appropriate signatures as indicated, and submit completed form to Chair, Graduate Council, or Chair, Undergraduate Curriculum Committee for approval.

Originator ___________ Date ___________ Chair, Graduate Council ___________ Date

Department Head/Program Chair ___________ Date ___________ OR

Dean or Associate Dean ___________ Date ___________ Chair, Undergraduate Curriculum Committee ___________ Date

**Associate Vice President for Institutional Compliance

CATALOG DIRECTOR

These changes/additions have been made for the University Catalog and entered into the BANNER term named above.

Catalog Director ___________ Date

REGISTRAR'S USE ONLY

SCACRISE ___________________ SCADETL ___________________ SCAPREQ ___________________ SCABASE ___________________

SCAFRES ___________ Operator Init. ___________ Date ___________

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ROR484002
BME 4320 Engineering and Clinical Applications in Medicine
Fall 2014

2013-2014 Catalog Data: Exposes junior and senior undergraduates in biomedical engineering and premedical sciences to global issues in healthcare. Focuses on medical devices and their proper use in the clinical setting. Emphasizes devices used to improve patient outcomes and reduce cost. Includes new technology trends in various venues through labs and lectures.

Required or Elective: elective

Prerequisites and Requirements: This course is limited to third and fourth year biomedical engineering and premedical undergraduate students. Students will be required to obtain written approval from their academic advisor and the course instructor.

Textbook (T) and References (R):

Biomedical Engineering for Global Health
10th Edition, Rebecca Richards-Kortum
Cambridge Texts in Biomedical Engineering

Course Learning Outcomes:

Students completing this course should:
1. Understand how healthcare is delivered in select foreign countries and in the U.S. today for those commercially insured and those covered by government insurance programs with understanding of the fundamentals of finance and reform trends for the future.
2. Comprehend the basics of new device approval and the regulatory process.
3. Learn how existing devices were developed from a design and engineering perspective and ultimately approved for use.
4. Become familiar with design and engineering through exposure to the clinical setting to include patient outcomes and costs of use.
5. Understand how new and developing technologies may change care in the future and the challenges of the device approval process for new technologies.
6. Master the fundamentals of information technology usage in the healthcare delivery system to include legal and regulatory issues.

Topics covered and associated time:

1. Review of healthcare delivery in the U.S. and around the world (two lectures)
2. Review of the American and international pharmaceutical and device manufacturing industries with focus on employment and future trends. (two lectures)
3. Cardiovascular medicine and devices (two lectures and two hours of clinical)
4. Radiation oncology (two lectures and two hours of clinical)
5. Ophthalmology (two lectures and two hours of clinical)
6. Physical medicine and rehabilitation (two lectures and two hours of clinical)
7. Critical care and pulmonary medicine (two lectures and two hours of clinical)
8. Information technology (two lectures and two hours of clinical)
9. ENT (two lectures and one hours of clinical)
10. Endocrinology and Urology (two lectures and two hours of clinical)
11. Gastroenterology (two lectures and two hours of clinical)
12. Nephrology (two lectures and two hours of clinical)
13. Radiology (two lectures and two hours of clinical)
14. General, cardiovascular, and orthopedic surgery (four lectures and four hours of clinical)

Class schedule:

The proposal is to have a total of 30 hours of classroom lectures given on Monday and Wednesday afternoons from 2-3 pm. In addition to this, there will be approximately 30 hours of clinical exposure given on Fridays from 2 to 4 pm. There will be clinical rotations where the students visit local hospitals and physician offices to gain first hand insight.

The students will be divided into small groups of two or three or four students for each clinical experience.

Contribution of the course to meeting the requirements of curriculum:

Students are expected to be able to apply science and engineering principles to solve problems in the interface of engineering and biology. This course allows students to take fundamental principles developed in the freshman and sophomore years and then apply them to existing and emerging technologies in healthcare delivery.

Relationship of the course to program outcomes:
See assessment matrix

Grading policy:
Midterm 20%, Final 30%, Term paper 20%, Quizzes 20%, Homework 10%

Prepared by:

Dave Weldon M.D., Biomedical Engineering
## Outcomes Assessment Matrix for BME 4320

<table>
<thead>
<tr>
<th>Course Learning Outcomes</th>
<th>Relationship of Course Learning Outcomes to Program Outcomes</th>
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### Key

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<th>Program Outcome Description</th>
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◊ = The course objective lightly addresses the Program Outcome
◆ = The course objective strongly addresses the Program Outcome

Program Outcomes A-K: ABET Criterion #3 Program Outcomes
Program Outcomes L & M: ABET Criterion #9 Program Criteria

Course outcomes assessment matrix completed by: Dave Weldon, M.D., Biomedical Engineering

Date: 8/15/2013