REQUEST TO CHANGE THE REQUIREMENTS FOR A COURSE

Any change, addition or removal of any restriction, or change in credit hours or availability for a course requires this form, accompanied by any supporting documentation, be completed and approved as indicated below.

COLLEGE: Engineering

DEPARTMENT: Biomedical Engineering

REQUEST IS FOR CHANGE IN COURSE: BME 4300

Course Title: Independent Study in Biomedical Engineering

TO BE INCLUDED IN 2018 / 2019 CATALOG

Course changes are effective beginning with the fall term in which they appear in the University Catalog.

IS REQUEST FOR A CHANGE IN THE NAME LISTED ABOVE? □ Yes □ No If yes, requested name:

IS REQUEST FOR A CHANGE IN CREDITS FOR COURSE LISTED ABOVE? □ Yes □ No If yes, current credits 3 credits requested credits Variable 1-3 or

IS REQUEST TO CHANGE RESTRICTIONS FOR COURSE LISTED ABOVE? □ Yes □ No If yes, please check all that apply:

☐ Add ☐ Remove ☐ Prerequisite ☐ Corequisite

☐ Add ☐ Remove ☐ Prerequisite ☐ Corequisite

☐ Add ☐ Remove ☐ Other Restrictions* ☐ Yes ☐ No If yes, please use box below:

*Other restrictions may include changing the grade mode (P/F, S/N, A-F, C/D), deactivating a course already in the system, majors or class levels restricted from registration, or other restrictions.
Please enter the complete prerequisite/restriction list as it should appear if this change is approved:

*Note: No changes have been made to prerequisite/restriction list.
Minimum student level - Junior
Requirement(s): Department head approval

☐ Yes □ No Is this request for the course to be used to measure program-level student learning outcomes?
☐ Yes □ No Is this request for the course to satisfy the scholarly inquiry requirement? If yes, attach "Q" materials for review.
☐ Yes □ No Will this change impact any existing programs? If yes, attach "Changing Graduation Requirements" form for each program that is impacted.

APPROVALS: Once appropriate department approvals are completed, submit to the Office of Graduate Programs, or Undergraduate Curriculum Committee Chair for placement on agenda.

1)  

Originator:  

Date: 8/10/17

2)  

Department Head/Program Chair:  

Date: 8/10/17

3)  

Dean or Associate Dean:  

Date:  

Chair, Undergraduate Curriculum Committee: Date

4)  

Chair, Graduate Council: Date

OR

CATALOG & CURRICULUM MANAGER'S USE ONLY

SCACREASE: SCADETL: SCAPREQ:

SCBASE: SCARRIES: ACALOG: Operator Initials: Date:

DISTRIBUTION

Original – Catalog & Curriculum Manager
Copy – Academic Unit

Florida Institute of Technology • Office of the Registrar
150 West University Boulevard, Melbourne, FL 32901-6975 • (321) 674-8114 • Fax (321) 674-7827

RGR-254-1915
New courses are available beginning with the fall term in which they appear in the University Catalog.

SUBJECT: Biomedical Engineering
COURSE NO.*: 3222
CREDIT HOURS: 3
ACADEMIC YEAR TO BE ADDED TO THE FILE: Fall 2018

CLASS HOURS: 45/semester
LECTURE HOURS: 45/semester
LAB HOURS: 0/semester
CONTACT HOURS (CEU ONLY): N/A

DEPARTMENT: Biomedical Engineering
SCHEDULE TYPE: Lecture (A)

☐ COLLEGE OF AERONAUTICS – 23
☐ NATHAN M. BISK COLLEGE OF BUSINESS – 24
☐ COLLEGE OF ENGINEERING AND COMPUTING – 01
☐ COLLEGE OF PSYCHOLOGY AND LIBERAL ARTS – 25
☐ COLLEGE OF SCIENCE – 26
☐ SCHOOL OF HUMAN-CENTERED DESIGN, INNOVATION AND ART – 28

COMPUTER TITLE: Bio Signals and Applications

This course will be entered into the system as: Bl-Level ☐ Cross-Listed ☐ Dual-Numbered ☐ Full-Load ☐ None of these/Standard Listing ☐

CATALOG TITLE: Bio Signals and Applications

CATALOG DESCRIPTION OF COURSE: Restricted to 150 characters, including spaces

Brings together fundamental mathematical techniques indispensable to the study of signals and systems in bioengineering. Covers properties and applications of Fourier series, and Fourier and Laplace transforms to linear continuous systems with applications to biomedical engineering. Includes MATLAB and introduces state-space systems descriptions. This description has been approved by the catalog office.

GRADES TO BE ISSUED:

☐ A, B, C, D, F
☐ A, B, C, D, F, CEU/Audit
☐ CEU
☐ S, U
☐ P, F
☐ Other

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

ADDITIONAL RESTRICTION: ○ and □ or

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 Alpha 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, review and signature required.**

☐ Yes ☐ No ☐ Will this course be used to satisfy the scholarly inquiry requirement? If yes, attach Q materials for review.

☐ Yes ☐ No ☐ Will this course impact any existing programs? If yes, attach “Changing Graduation Requirements” form for each program impacted.

APPROVALS: On completion of description and course number verification, affix appropriate signatures as indicated, and submit to the Office of Graduate Programs, or Undergraduate Curriculum Committee Chair for placement on agenda.

REGISTRAR’S USE ONLY

SCACRSE: ___________________ SCADEL: ___________________ SCAREQ: ___________________ SCABASE: ___________________ ACALOG: ___________________

SCABRES: ___________________ CIP Code: ___________________ Operator Init.: ___________________ Date: ___________________

Florida Institute of Technology • Office of the Registrar
130 West University Boulevard, Melbourne, FL 32901-6975 • (321) 674-8114 • Fax (321) 674-7827
RGR-338-417
2015-16 Catalog Data: 3 Credits. Brings together fundamental mathematical techniques that are indispensable in the study of signals and systems in bioengineering. Covers properties and applications of Fourier series, Fourier and Laplace Transforms to linear continuous systems with applications to biomedical engineering. Includes MATLAB applications. Introduces state-space description of systems.

Credits & Contact Hours: 3 Credits, 30 lectures (75 mins)

Required or Elective or Selected Elective:

Prerequisite and Co-Requisite Courses: ECE 4991

Textbook (T) and References (R):
Signals and Systems for Bioengineers: a MATLAB-based introduction
John Semmlow
Recommended:

Instructor
Dr. Carlos F Martino  Office: LINK 341 Phone: 321-674-8497 Email: cmartino@fit.edu

Course Outcomes: Upon completion of this course the student will be able to:
1. Understand the fundamental concepts that define the field of biosignals and systems
2. Demonstrate an understanding of frequency domain analysis via Fourier Transforms
3. Understand applications and implications of Fourier Transform
4. Demonstrate understanding of application of time - frequency transformations and interpretation of the results
5. Understand implementation of signal acquisition/processing in MATLAB
6. Demonstrate an understanding of linear system analysis via Laplace Transforms

Topics Covered:
1. General overview of Bioengineering Signals and Systems (1 week)
2. Basic Signal Processing Concepts (2 weeks)
3. Fourier Series and Fourier Transforms (2 weeks each)
4. Transfer Function (2 weeks)
5. Laplace Transforms (2 weeks)
6. Convolution and Simulations (2 weeks)
7. Applications of Linear Systems (2 weeks)

Grading Policy
Homework (10%), Exam 1 (20%), Exam 2 (20%), Final (30%)

Grading System
A = 90-100    B = 80-89    C = 70-79    D= 60-69    F= 0-59
<table>
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<th>Assignments</th>
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<tr>
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<td>Applications of Fourier Transform</td>
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<td>Transfer Function</td>
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<td>Convolution and Frequency Domain</td>
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<td>Fourier Transform and Power Spectrum Applications</td>
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<td>Sampling/Test 3</td>
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# Outcomes Assessment Matrix for BME 3222

## Relationship of Course Outcomes to Student Outcomes

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### Key

- ◊ = The course outcome lightly addresses the Student Outcome
- ♦ = The course outcome strongly addresses the Student Outcome

### Student Outcome Descriptions

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Prepared By: Carlos Martino, Ph.D., Assistant Professor of Biomedical Engineering

Date: 01/09/2017
The Department of Biomedical Engineering requests the replacement of the currently required ECE 3222: Signals and Systems with the newly created course BME 3222: Bio Signals and Applications. This new course, BME 3222, combines signals and systems that are equivalent to those presented in ECE 3222 course with additional applications in Biomedical Engineering. See the attached syllabus for course equivalence.

**Approvals:** On completion of appropriate department approvals, submit form to Chair, Graduate Council, or Chair, Undergraduate Curriculum Committee, for approval below and forward to the Catalog & Curriculum Manager.

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<tr>
<td>Department Head / Minor Program Chair</td>
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**REGISTRAR'S USE ONLY**

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