



CURRICULUM PROPOSAL FORM 1999-2000

PROPOSAL SCC #00/01-

407 (A)

0909.554

NON-GENERAL EDUCATION PROCESS A

DEADLINES: Deadline dates for 2000/2001 submissions: Regular proposals: October 22, 2000 to be implemented in Fall 2001; Short-Term proposals: December 8, 2000 to be implemented in Fall, 2001; Regular proposals February 16, 2001 to be implemented in Spring 2002; March 23, 2001 for short-term courses to be implemented in Spring 2002

PROPOSAL TITLE: Theory and Engineering Applications of Wavelets (0909.554)

SPONSOR(S): Robi Polikar and John L. Schmalzel
 DEPARTMENT: Electrical and Computer Engineering
 COLLEGE:

IF LAS CHECK ONE: History/Humanities Math/Science Social/Behavioral Sciences

Check one: Undergraduate Graduate

THE ATTACHED *NON-GEN-ED* PROPOSAL IS BEST DESCRIBED BY THE ITEM(S) CHECKED.

New non-gen-ed course
 Short-term non-gen-ed course
 Minor curricular changes (fewer than three) to:
 existing non-gen-ed course
 non-gen-ed degree requirements
 major
 minor, specialization, concentration, track certificate program

DEPARTMENT
 (Signature indicates approval)

Dept. Curriculum Chair/Date Robi Polikar 02/13/2001
 Dept. Chairperson/Date John Schmalzel 13 FEB 2001

ACADEMIC DEAN

Approved Not Approved Comments:

Dean's Signature/Date Deanne Dole 2/15/01

Dean's Signature/Date _____

COLLEGE CURRICULUM COMMITTEE
Date of open hearing (if necessary) _____ Approved _____ Not Approved _____
Comments:
Signature of College Chair/Date: _____

UNIVERSITY CURRICULUM COMMITTEE
Date Received/Processed University Open hearing 11/14/02 Approved
Comments: Originally approved with minor changes in Dec, the proposal was lost when the changes were not submitted. Re-submitted by the College of Engineering in Feb 02, the proposal was approved at a University Open Hearing (11/14/02) in
Curriculum Chair Signature: Philip O. Ross Date Announced At Senate 11/15/02

EXECUTIVE VICE PRESIDENT/PROVOST
Approved Not Approved _____ If no, reasons are as follows:
Student Credit Hours: _____ Faculty Load Hours: _____ Equalized Credit Hours _____
Official Copy & Approval Sheet Filed (Date) _____ Executive VP/Provost Signature/Date Helen Miles-see 1/6/03

REGISTRAR
Date Approved Course Description Required 1/29/03
Hegis Taxonomy & Course Number Assigned 1/29/03 0909404
Registrar Signature/Date Edna C. Engelke 1/29/03

NOTIFICATION FORWARD
 Senate Curriculum Committee Chairperson
 Department Chairpersons Sponsor(s)
 Academic Dean(s) 1/31/03
 Registrar
Resch CAP
see

This copy represents the original materials due to loss of same

Course Proposal

1. Details:

- | | |
|---|--|
| a) Course Title: | Principles of Biomedical Systems and Devices (0909.404) |
| b) Sponsor: | Dr. Robi Polikar, Dr. John L. Schmalzel, and Electrical Engineering Curriculum Committee |
| c) Credit Hours: | 3 semester credit hours |
| d) Course Level: | Senior |
| e) Curricular Effect: | Elective course for electrical engineering majors |
| f) Prerequisites: | Electronics I (0909.311), Systems and Control I (0909.321) |
| g) Suggested Time/
Scale of Implementation | Spring 2002
One section |
| h) Resources | Existing faculty will teach this class.
Laboratory equipment will be obtained consistent with Engineering School multi year budget. |

*pr. dot
1/29/03
SK*

2. Rationale:

The proposed course is a revision to part of the Engineering Curriculum Proposal approved by the College Senate in December, 1994. The proposed course is consistent with the establishment of the School of Engineering approved by the Board of Trustees in February, 1995.

Biomedical engineering is one of the fastest growing areas, and there is a real need for an introductory class covering major biomedical systems and devices. Such a class will then serve as the background for those students who wish to explore this area further, and allow them to study advanced biomedical systems. This class will also introduce fundamental concepts of human physiological systems while discussing various biomedical devices developed to study such systems. The laboratory that will be designed for this class will allow participants to obtain real world experience on biomedical systems and devices.

3. Essence of the Course:

a) Objectives:

The proposed course has a number of objectives:

- Provide an overview of basic systems of human physiology, such as the cardiovascular system, nervous system and the respiratory system.
- Introduce various signals of biological origins, including how they are generated, how they are measured and how they are processed.

- Introduce biomedical devices that have been developed to analyze various physiological systems.
- Provide the participants with a solid understanding of electrical safety in biomedical instrumentation.

b) Topical Outline:

- Basic physiological systems of the human body, including cardiovascular, respiratory and nervous systems from an engineering point of view.
- Biopotentials: electrical signals of biological origin, including electrocardiogram (ECG), electroencephalogram (EEG), and electromyogram (EMG).
- Biosensors and transducers used to acquire biopotentials.
- Medical quality bioamplifiers to process biopotentials, devices used to measure ECG, EEG and EMG.
- Electrical safety in biomedical devices.

c) Evaluation and Grading Procedures:

Student grades will be based on projects, examinations, homework, laboratory reports and written and oral technical communication.

d) Course Evaluation:

The proposed course will be evaluated based on student evaluations and critical review by engineering faculty.

Texts:

John G. Webster, *Medical Instrumentation, Application and Design, 3rd Edition*, John Wiley and Sons, New York, 1998.

John D. Enderle, Susan M. Blanchard, and Joseph D. Bronzino, *Introduction to Biomedical Engineering*, Academic Press, 1999.

Joseph J. Carr and John Brown, *Introduction to Biomedical Equipment Technology, 3rd Edition*, Prentice Hall, New Jersey, 1997.

4. Results of Consultations:

a) Consulted Departments: Biology

b) Consultants and Consultant Statements: N/A

c) Written Consultations: Biology

5. Additional Supporting Information: N/A

6. Catalog Description:

Principles of Biomedical Systems and Devices (3 sh)

As a survey of biomedical engineering, this class will introduce various systems of the human physiology from an engineering perspective. In particular, students will be introduced to signals of biological origin obtained from these systems; biosensors, transducers and bioelectrodes used to acquire such signals, along with medical quality amplifiers for measuring biopotentials. Electrical safety of medical devices; measurements of the blood pressure, blood flow, and respiratory system will also be discussed. Along with a carefully designed set of experiments, this course will provide the fundamental principles of biomedical engineering from an electrical and mechanical engineering perspective.

Prerequisites: (0909.311, 0909.321)



Rowan University Senate

Date: June 4, 2001

To: Drs. Robi Polikar and John Schmalzel, Electrical and Computer Engineering
Dept.

From: Dr. Martin Itzkowitz, Chr. Senate Curriculum Committee

Re: Proposal for Principles of Biomedical Systems and Devices (0909.404)
SCC#99-00-408

Please alter the course description as follows:

- a) delete the last sentence or eliminate “fascinating wonders of a flawless” and replace it with more neutral language.
- b)) change next to last sentence – delete “and time permitting”; replace “will” with “might”.

Encl. Copy of proposal

MI/r

TO: Dr. Robi Polikar
FROM: Dr. Patricia Mosto, Chair Department of Biology
RE: Course Proposal
DATE: November 14, 2000

Robi, my department has read your course, Bio-Medical Engineering System, and we support your proposal.

Look like this course is really appropriate for Engineering, and we assume that the biological part is only using the human body as the "machine". In any case, there is a significant portion of the course that cover materials we teach in Anatomy and Physiology, and this could be a great course for a team-taught endeavor between our departments.

With the increased interest in bio-medical engineering from both the Mechanical and the Electrical Engineering departments, maybe the development of a course in human anatomy and physiology especially geared to engineers is something that we can do to enhance the engineering curriculum.

Is there any possibility that some of our Pre-med students can take your course?

No. Pat

If I can be of further assistant, please do not hesitate to call me.

Robi,

Your proposal for Principles of Biomedical Systems and Devices was approved with several suggested minor changes by the University Senate Curriculum Committee. The suggested changes are:

1. Rewrite the course description so that it more accurately reflects the course as you described it to the committee and reduces possible confusion as to course content.
 - a. Eliminate the last sentence of the current description
 - b. A modification to the first sentence was suggested: "As a survey of biomedical engineering, students will be introduced to various human physiological systems, signal of biological origin, biosensors, transducers, and bioelectrodes...."
 - c. Have the Hegis numbers changed for your department? Is 0909 still the correct number?
2. Have a library consultation and/or attach statement of intended funding for library acquisitions if they are, in fact, needed (This suggestion is based on your comments that there were possible alternative sources of funding for library acquisitions as resource allocation questions are not typically within the charge of the Curriculum Committee) .
3. Add total semester hours for course (the assumption was 3 semester hours by the committee).
4. Spell-check the entire document.

If you can provide me with the changed document by December 1, I can get moved over to the Provost's Office soon after. While you are making those changes, I will walk a new Process A Form (the cover sheet) passed all those who signed before so that we can have "fresh" signatures.

...PAL

Phillip A. Lewis, Ph.D.
Assistant Professor
Marketing Department
Rowan University

From: Polikar, Robi
To: Lewis, Phillip A.
Date: 11/18/02 10:44AM
Subject: RE: Proposal 00-01-408: Approved with minor suggested changes

Dear Phillip:

Please find the attached revised course proposal. I have made the following changes:

1. Last sentence from the course description has been removed. The first sentence has been modified (not exactly the way suggested though, since the sentence "As a survey of biomedical engineering, students will be introduced to...." sounds rather awkward to me. The Hegis number has not changed, since no undergraduate courses have been proposed since then by the ECE department.

2. I have simply removed the required library resources clause for the following reasons:

At the time this proposal was written, there was a pot of money sat aside for Engineering to purchase library books. I have been told that that money have been removed from that account due budget crisis. I am still planning on getting some books from the NSF grant, which we have recently heard from the program officer that it will be funded. However, since it may take months for NSF to send the official award letter, and since it is theoretically possible for congress not to approve NSF's next year budget, I have no written proof of this grant at this time, with the exception of the program officer's one line e-mail.

3. Total number of semester hours is indeed three, and it appears at least twice in the document (first and last page). I have not made any changes to the document for this purpose.

4. I have spell checked the entire document. I apologize in advance if there are any typos that I and/or the spell checker have missed.

I hope everything is in order. I thank you very much for following up this proposal.

Warm regards,

Robi.

Robi Polikar, Ph.D.
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Rowan University
201 Mullica Hill Road
Glassboro, NJ 08028

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On the web: <http://engineering.rowan.edu/~polikar>

-----Original Message-----

From: Lewis, Phillip A.
Sent: Thursday, November 14, 2002 1:23 PM
To: Polikar, Robi
Cc: Chin, Steven; Schmalzel, John L.
Subject: Proposal 00-01-408: Approved with minor suggested changes