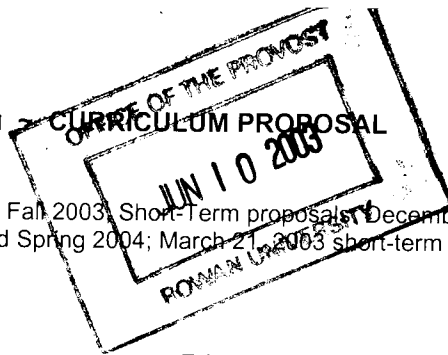


**PROCESS A** NON-GENERAL EDUCATION



SCC #02-03- 2113

Fall/04

**Deadlines:**

Regular proposals: October 18, 2002 to be implemented Fall 2003; Short-Term proposals: December 6, 2002 to be implemented Fall 2003  
Regular proposals: February 14, 2003 to be implemented Spring 2004; March 21, 2003 short-term courses to be implemented Spring 2004

**PROPOSAL TITLE:** Introduction to Biofluids

Sponsor(s): John C. Chen E-Mail: jchen@rowan.edu Ext: 5346  
E-Mail: \_\_\_\_\_ Ext: \_\_\_\_\_  
E-Mail: \_\_\_\_\_ Ext: \_\_\_\_\_

**DEPARTMENT:** Mechanical Engineering

**COLLEGE:** Engineering

If Liberal Arts & Sciences CHECK :  History/Humanities  Math/Sciences  Social/Behavioral Sciences  
 **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)
- Existing non-gen-ed course
- Non-gen-ed degree requirements
- Major
- Minor, specialization, concentration, track, certificate program

**The following signatures REPRESENT APPROVAL**

Department Chair: [Signature] Date: 4/14/03  
 Department Curriculum Chair: [Signature] Date: 2/14/03  
 Academic Dean: [Signature] Date: 2/14/03  
 College Curriculum Chair: [Signature] Date: 5/12/03  
 College Curriculum Committee OPEN HEARING Date: 4/11/03 Approved  Not Approved

**UNIVERSITY CURRICULUM COMMITTEE**

Senate Curriculum Chair Signature: [Signature] Date: 6/14/2003 Senate Announcement/Note: 6/10/2003  
Comments: \_\_\_\_\_

**EXECUTIVE VICE PRESIDENT/PROVOST** Signature: [Signature] Date: 7/7/04

Approved ~ Not Approved due to the following:  Student Cr Hrs  Faculty Load Hrs  Equalized Cr Hrs

Date: 7/8/04 **REGISTRAR** Course Description Received & Approved ~ Hegis Taxonomy & Course #: 0910471  
Registrar Signature: [Signature] ~~0901341~~

**NOTIFICATION FORWARD**

SCC Chair  Academic Dean  Department Chair  Registrar \_\_\_\_\_ Sponsor(s) \_\_\_\_\_  
Adams, C.P. J.R.S 7/27/04 036 45/04

Rowan University  
**LIBRARY RESOURCES**  
 to

**SUPPORT A NEW COURSE or NEW PROGRAM PROPOSAL**

The purpose of this form is to provide a channel of communication between the library and faculty designing new courses/programs. The information will be used to assess the resources available in the library, and to identify resources the library should acquire to support the course/program. The information will also provide rationale for institutional support for library acquisitions

This form should be completed in a coordinated effort between the course sponsor(s) and the academic department liaison librarian.

- The sponsor(s) complete parts A & D  
 If assistance is required to complete parts A & D, please notify the liaison librarian.
- Forward this form to the librarian who will complete parts B, C, & E

***This form must be completed and attached to the original curriculum proposal before being approved by the Senate Curriculum Committee***

A. College Engineering Department Mechanical Engineering

Proposed by: John C. Chen Date: April 12, 2003

Course Title: Introduction to Biofluids

Anticipated Date for Course/Program Offering: Fall 2004

- B. Describe the resources available in the library to support this course/program, including reference, monographic, electronic databases, audio-visual materials, etc. A summary statement is sufficient.

Campbell Library acquires monographs in all aspects of mechanical engineering through an approval plan that automatically supplies new titles from the major publishers in these fields. Conference proceedings are available upon request through the same plan. Numerous reference volumes will support this course to include: Dictionaries, handbooks, standards, and encyclopedias published by IEEE, McGraw Hill, Wiley, and CRC. Electronic databases that will support the course are: *Science Direct* which includes mechanical engineering and biology journal titles published by Elsevier; Engineering Village which includes Compendex.; General Science Full Text, Biosis, and the Applied Science and Technology Index. Audio-visual materials have not been systematically acquired in this area, but can be purchased as needed.

- C. List key periodicals available in the library to support this course/program.

ASME Journal of Biomechanical Engineering, Journal of Biomechanics  
 Clinical Biomechanics

- D. List specific resources that should be acquired to support this course.

None for now, but perhaps future acquisitions of newly released textbooks will be required.

- E. Librarian comments and recommendations:

Monographs, reference works, and journals holdings are adequate to support this course. If other materials should be needed, they will be purchased or acquired through document delivery services.

**SCC#02-03-408**

## **NEW COURSE PROPOSAL**

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### ***Details***

**a. Course Title:**

Introduction to Biofluids

**b. Sponsor**

John C. Chen, Mechanical Engineering

**c. Credit Hours – 3**

**d. Course Level:** Senior Level

**e. Prerequisites:** Fluid Mechanics I (0901.341)

**f. Suggested Time and Scale of Implementation:** To be offered every other year, starting Spring 2004

### ***Curricular Effect***

The proposed course will be offered as a senior-level elective for Mechanical Engineering students. Undergraduate mechanical engineering students are required to take four mechanical engineering electives in their senior year. This course will serve as one of these electives. Other engineering students with the required prerequisites may also enroll in this course.

The proposed course will require no additional staff, space or other resources. The only library resources required for this course will be access to the electronic and print journals already maintained by the Library.

### ***Rationale***

Currently, engineering is experiencing a rapid convergence with human biology, driven mainly by society's needs for better health care, engineering approaches to health care and the growth of the retirement-age population in the US. This course will present an introduction to the role of fluids transport in maintaining proper functioning of the human body.

## ***Essence of the Course***

### **a. Objectives**

The goal of this course is to present an introduction to fundamental concepts of fluid mechanics and mass transport that are involved in mammalian cell function. Special attention is given to the vascular circulation system and problems that commonly occur therein. This course will include a small laboratory component and will involve independent learning about the state-of-the-art in biofluids research.

### **b. Topical Outline/Content**

1. Introduction
2. Basics of Biofluid Mechanics
3. The Heart
4. Fluid Dynamics: Conservation of Mass Energy and Momentum
5. Hemodynamics in Vascular Channels
6. Constitutive Modeling of the Vascular System

### **c. Evaluation of students and grading procedure**

Students will be evaluated through in-class examinations, homework sets, completion of a final project, and in-class presentations.

### **d. Course evaluation**

The success of the course in meeting course goals will be determined through use of in-class examinations, the quality of projects, and student evaluations.

## ***Letters of Consultation***

A letter of consultation from the Department of Biological Sciences, Dr. Pat Mosto, Chair, is attached.

## ***Catalog Description***

### **Introduction to Biofluids (Suggested HEGIS Number 0910.471)**

The goal of this course is to present an introduction to fundamental concepts of fluid mechanics and mass transport that are involved in mammalian cell function. Special attention is given to the vascular circulation system and problems that commonly occur therein. This course will include a small laboratory component and will involve independent learning about the state-of-the-art in biofluids research. Prerequisite: Fluid Mechanics I (0901.341).

February 26, 2003

Dr. John Chen  
Department of Mechanical Engineering  
Rowan University

Dear John:

Members of my department and I have reviewed your course proposals for Introduction to Biomechanics, Introduction to Biofluids, and Introduction to Biomaterials, and we strongly endorse these proposals. The courses content is unique, and specifically tailored to engineering students.

In addition, these courses would be interesting electives for Biology students planning careers in the medical profession, or could have some exercises that could be applied to our courses. Some members of the department think that another course that could be added to the list of bio-oriented engineering courses in the future is Functional Morphology (a course about looking at biomechanics in an evolutionary context), which is a very active area of research these days.

The department also sees an opportunity for contributing to any of these courses through guest lectures. The Biology Department strongly supports any effort that engineering is trying to do to bring biology into their curriculum.

Please do not hesitate to contact me if I can be of further assistance.

Sincerely,

Dr. Patricia Mosto  
Chair and Professor  
Biology Department  
Rowan University  
856-256-4834  
mosto@rowan.edu

February 26, 2003

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Department of Mechanical Engineering  
Rowan University

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