

FLORIDA ATLANTIC UNIVERSITY™

Graduate Programs—NEW COURSE PROPOSAL¹

UGPC APPROVAL _____
 UFS APPROVAL _____
 SCNS SUBMITTAL _____
 CONFIRMED _____
 BANNER POSTED _____
 CATALOG _____

DEPARTMENT: CEECS

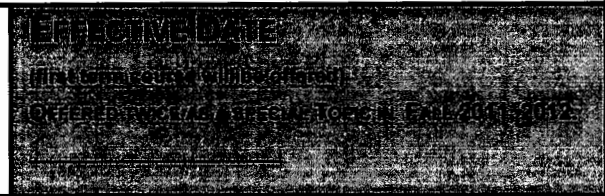
COLLEGE: ENGINEERING AND COMPUTER SCIENCE

RECOMMENDED COURSE IDENTIFICATION:

PREFIX BME COURSE NUMBER 6334 LAB CODE (L or C) _____

(TO OBTAIN A COURSE NUMBER, CONTACT MJENNING@FAU.EDU)

COMPLETE COURSE TITLE: TISSUE ENGINEERING



CREDITS²: 3

TEXTBOOK INFORMATION: 1. Tissue Engineering Saltzman W. Mark Oxford, University Press, New York, 2004. Supplementary/recommended readings
 2. Tissue Engineering Bernard O. Palsson and Sangeeta Bhatia Pearson Education, Inc., 2004 Upper Saddle River, NJ, 07458

GRADING (SELECT ONLY ONE GRADING OPTION): REGULAR X SATISFACTORY/UNSATISFACTORY _____

COURSE DESCRIPTION, NO MORE THAN THREE LINES:

Principles and newest concepts of tissue engineering. Learning and studying molecular, cellular, and tissue culture aspects of TE and Laboratory work and high level of instrumentations that helps this Laboratory work to grow the tissues. Mechanical functions of the cells, extracellular matrix, types, quality, purposes of scaffolds as the supporters of 3-D tissue growth, discussed.

PREREQUISITES*: NONE

COREQUISITES*: NONE

REGISTRATION CONTROLS (MAJOR, COLLEGE, LEVEL)*:

GRADUATE STUDENTS IN COMPUTER SCIENCE, COMPUTER ENGINEERING, AND ELECTRICAL ENGINEERING (ENGINEERING). IF NOT, CONSENT OF INSTRUCTOR.

* PREREQUISITES, COREQUISITES AND REGISTRATION CONTROLS WILL BE ENFORCED FOR ALL COURSE SECTIONS.

MINIMUM QUALIFICATIONS NEEDED TO TEACH THIS COURSE: PHD

Faculty contact, email and complete phone number:
 Mirjana Pavlovic, mpavlovi@fau.edu, 7-2348

Please consult and list departments that might be affected by the new course and attach comments.³ NA

Approved by:

Department Chair: Nancy Sudy
 College Curriculum Chair: Walter R. R. R.
 College Dean: [Signature]
 UGPC Chair: [Signature]
 Graduate College Dean: Abdullah H. Hay
 UFS President: _____
 Provost: _____

Date:
11/27/13
11/27/13
12/14
1-30-14

1. Syllabus must be attached; see guidelines for requirements: www.fau.edu/provost/files/course_syllabus.2011.pdf
2. Review Provost Memorandum: **Definition of a Credit Hour** www.fau.edu/provost/files/Definition_Credit_Hour_Memo_2012.pdf
3. Consent from affected departments (attach if necessary)

Email this form and syllabus to UGPC@fau.edu one week before the University Graduate Programs Committee meeting so that materials may be viewed on the UGPC website prior to the meeting.

**Department of Computer and Electrical Engineering and Computer Science
Florida Atlantic University
Course Syllabus**

1. Course title/number, number of credit hours		
Tissue Engineering – BME 6334 6334	3 credit hours	
2. Course prerequisites, corequisites, and where the course fits in the program of study		
No prior Biology background assumed. Prior BME 5000 Introduction to Bioengineering will help.		
3. Course logistics		
<i>Term:</i> TBA This is a classroom lecture course with PP presentations <i>Class location and time:</i> TBA This course is conceptual.		
4. Instructor contact information		
<i>Instructor's name</i> <i>Office address</i> <i>Office Hours</i> <i>Contact telephone number</i> <i>Email address</i>	Dr. Mirjana Pavlovic, Adjunct Professor Engineering East (EE-96) Bldg., Room 515 TBA 561-297-2348 mpavlovi@fau.edu	
5. TA contact information N/A		
6. Course description		
Principles and newest concepts of tissue engineering: concise and comprehensive. Learning and studying molecular, cellular, and tissue culture aspects of TE and Laboratory work and high level of instrumentations that helps this Laboratory work to grow the tissues. Emphasis will be stressed on the mechanical functions of the cells, extracellular matrix, types, quality and purposes of scaffolds as the supporters of 3-D tissue growth and signaling molecules that "engineer" cellular events toward differentiation and integrative complexity of tissues. Stem cell research in its fundamental re-generative purposes will be considered. Tissue barriers to molecular and cellular transports, cell interaction with polymers, and case studies in Tissue Engineering will be discussed. The Computer aid TE with inventive Ink-jet printing methodology in connection with robotics and nano-robotics will be among the topics. . For the time being there will be NO actual lab. However, conceptual experiments will be elaborated during the classes.		
7. Course objectives/student learning outcomes/program outcomes		
<i>Course objectives</i>	<ul style="list-style-type: none"> • Understanding global and particular tissue development, architecture, control mechanisms and quantitativization in engineering procedures. • Studying fundamental processes in signal transduction, related to sensorial tissues and organs, with emphasis on excitable tissues (muscle and neural tissues). • Understanding basic principles of Tissue Engineering, at molecular, cellular and tissue level 	
8. Course evaluation method		
Home Work -	60%	
Power point presentations	20%	

**Department of Computer and Electrical Engineering and Computer Science
Florida Atlantic University
Course Syllabus**

Final Examination -	20 %
9. Course grading scale	
Grading Scale: 90 and above: "A", 87-89: "A-", 83-86: "B+", 80-82: "B", 77-79: "B-", 73-76: "C+", 70-72: "C", 67-69: "C-", 63-66: "D+", 60-62: "D", 51-59: "D-", 50 and below: "F."	
10. Policy on makeup tests, late work, and incompletes	
<p><i>Makeup tests</i> are given only if there is solid evidence of a medical or otherwise serious emergency that prevented the student of participating in the exam. Makeup exam should be administered and proctored by department personnel unless there are other pre-approved arrangements</p> <p><i>Late work</i> is not acceptable.</p> <p>A grade of <i>incomplete</i> will be assigned only in the case of solid evidence of medical or otherwise serious emergency situation.</p>	
11. Special course requirements	
Students have to perform 1 power point presentation per semester	
12. Classroom etiquette policy	
University policy requires that in order to enhance and maintain a productive atmosphere for education, personal communication devices, such as cellular phones and laptops, are to be disabled in class sessions.	
13. Disability policy statement	
<p>In compliance with the Americans with Disabilities Act (ADA), students who require special accommodations due to a disability to properly execute coursework must register with the Office for Students with Disabilities (OSD) located in Boca Raton campus, SU 133 (561) 297-3880 and follow all OSD procedures.</p> <p style="text-align: center;"><i>URL to be added.</i></p>	
14. Honor code policy	
<p>Students at Florida Atlantic University are expected to maintain the highest ethical standards. Academic dishonesty is considered a serious breach of these ethical standards, because it interferes with the university mission to provide a high quality education in which no student enjoys unfair advantage over any other. Academic dishonesty is also destructive of the university community, which is grounded in a system of mutual trust and place high value on personal integrity and individual responsibility. Harsh penalties are associated with academic dishonesty. See University Regulation 4.001 at www.fau.edu/regulations/chapter4/4.001 Code of Academic Integrity.pdf</p>	
15. Required texts/reading	
<p>1. Tissue Engineering Saltzman W. Mark Oxford, University Press, New York, 2004. [The book is not followed strictly, but is essential. It's okay to order a used book online]</p>	
16. Supplementary/recommended readings	
<p>Good to have but not obligatory:</p> <p>2. Tissue Engineering Bernard O. Palsson and Sangeeta Bhatia Pearson Education, Inc., 2004 Upper Saddle River, NJ, 07458</p>	
17. Course topical outline, including dates for exams/quizzes, papers, completion of reading	

**Department of Computer and Electrical Engineering and Computer Science
Florida Atlantic University
Course Syllabus**

Topics and approximate # of 1.5 hr classes

1. CELLS AND TISSUES (12)

Microscopy: scaling visual field

Elements of Embryology-Tissue Development

Tissue engineering fundamentals with sensorial system:

- Cell differentiation
- Describing cell differentiation mathematically
- Cell Migration
- Describing cell migration mathematically

Tissue engineering practice :

- Approaches to Tissue Engineering
- Case studies in Tissue Engineering
- Scaling up *ex vivo* cultivation
- Computer Aided Tissue Engineering

2. SCAFFOLDS (7)

- Tailoring Biomaterials
- Biomaterial scaffolds
- Properties
- Surface properties
- Bulk properties
- Mechanical Properties
- Biological Properties

Further readings

3. SIGNAL MOLECULES (1)

- To be chosen and restricted to necessary

4. TISSUE ENGINEERING STUDY PROBLEMS(4)

- Quantitative Cell and Tissue Biology
- Cell and Tissue Characterization
- Engineering methods and Designs in Autoimmune and Cancerous Diseases
- Clinical Implementation

Student PP presentations (6)

Final Exam: TBA

Barbara Bebergal

From: Mihaela Cardei
Sent: Friday, January 31, 2014 12:28 PM
To: Ali Zilouchian; Barbara Bebergal
Cc: Zvi Roth; Nurgun Erdol; Mirjana Pavlovic
Subject: FW: New Course Proposals BME6324 and BME6334

Hello Dr. Zilouchian,

please find below the approval from the College of Science (Dr. David Binninger) regarding the two courses: BME 6324 and BME6334.

Thank you,
Mihaela Cardei

From: Zvi Roth
Sent: Friday, January 31, 2014 12:21 PM
To: Mihaela Cardei
Cc: Nurgun Erdol; Mirjana Pavlovic
Subject: FW: New Course Proposals BME6324 and BME6334

Are we late? It just came.
Zvi

Dr. Zvi S. Roth
Professor
Department of Computer & Electrical Engineering & Computer Science
Florida Atlantic University
Engineering East Building, Room 519
777 Glades Road
Boca Raton, FL 33431
561-297-3471

From: David Binninger [binninge@fau.edu]
Sent: Friday, January 31, 2014 12:15 PM
To: Zvi Roth
Subject: Re: New Course Proposals BME6324 and BME6334

Hi Zvi,

I hope this e-mail reaches you in time. I do not see any conflict with the proposed graduate courses and any graduate course offered in the biological sciences department. If you have questions or need additional information, please let me know.

Regards,
David

David Binninger, PhD
Associate Professor and Associate Chair
Biological Sciences Department
and
Center for Molecular Biology and Biotechnology
Charles E Schmidt College of Science
Florida Atlantic University
777 Glades Road
Boca Raton, FL 33431
(561) 297-3323

On Jan 30, 2014, at 4:44 PM, Zvi Roth <rothz@fau.edu> wrote:

Dear David,

Happy New Year! How are you?

We are trying to obtain catalog numbers to two Bioengineering courses developed by Dr. Mirjana Pavlovic: Tissue Engineering, and Stem Cell Engineering.

The course proposals (with syllabi) are attached.

We need an e-mail of support from the College of Science (I guess from you, and I am so sorry for the last minute notice) to indicate that the two proposed courses don't create any conflict of offerings or any other concerns.

I believe that if such a support is received by tomorrow morning we can still get the courses approved now. Otherwise it will have to wait for a future meeting of the graduate committee.

Regards,

Zvi

Dr. Zvi S. Roth

Professor

Department of Computer & Electrical Engineering & Computer Science

Florida Atlantic University

Engineering East Building, Room 519

777 Glades Road

Boca Raton, FL 33431

561-297-3471

From: Mihaela Cardei

Sent: Thursday, January 30, 2014 4:33 PM

To: Zvi Roth

Cc: Mirjana Pavlovic

Subject: FW: RE: New Course Proposals BME6324 and BME6334

Hi Zvi,

the two course proposals (including the syllabi) are attached.

BME 6334 Tissue Engineering

BME 6324 Stem Cell Engineering

Thank you,

Mihaela

From: Barbara Bebergal
Sent: Wednesday, January 29, 2014 4:17 PM
To: Nurgun Erdol; Zvi Roth
Cc: Ali Zilouchian
Subject: RE: New Course Proposals BME6324 and BME6334

Good afternoon,

The UGC did not approve these two course proposals. The UGC wants a letter from the College of Science stating that there is no conflict of interest with their program. These cannot go forward until this letter is sent to Dr. Zilouchian. We only have until Friday morning to get this signed by Dr. Zilouchian and move it forward to Steering. If not, it will held until the next UGC meeting on Feb. 26.

Thank you

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Barbara Bebergal
Administrator of Office Operations
Division of Research & Graduate College
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Fax: 561-297-2117
Email: bbeberga@fau.edu
Website: www.fau.edu/graduate
Website: <http://www.fau.edu/research>

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<MirjanaPavlovic-StemCellEngineering.pdf><MirjanaPavlovic-TissueEngineering.pdf>