FLORIDA ATLANTIC UNIVERSITY™

Graduate Programs—NEW COURSE PROPOSAL[1]

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

DEPARTMENT: CEECS

COLLEGE: ENGINEERING AND COMPUTER SCIENCE

RECOMMENDED COURSE IDENTIFICATION:

PREFIX BME COURSE NUMBER ~~6XXX~~ 6324 (C) ____

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

COMPLETE COURSE TITLE: STEM CELL ENGINEERING

EFFECTIVE DATE (first term course will be offered)
OFFERED ONCE AS A SPECIAL TOPIC AS OF FALL 2013; SCHEDULED AGAIN FOR FALL 2014

CREDITS[2]: 3

TEXTBOOK INFORMATION: 1. MIRJANA PAVLOVIC AND BELA BALINT: STEM CELLS AND TISSUE ENGINEERING (SPRINGER BRIEFS IN ELECTRICAL AND COMPUTER ENGINEERING), NY, HEIDELBERG, 2013
ISSN: 2191-8120 (ELECTRONIC)
ISBN: 978-1-4614-5505-9 (PRINTED)

GRADING (*SELECT ONLY ONE GRADING OPTION*): REGULAR __X__ SATISFACTORY/UNSATISFACTORY ______

COURSE DESCRIPTION, NO MORE THAN THREE LINES:
FOCUS ON THE STEM CELL'S RESEARCH AND ENGINEERING TO CLARIFY THE NATURE OF THESE CELLS; THEIR SOURCES, CATEGORIES; ENGINEERING FOR DIFFERENT PURPOSES, THEIR ROLE AS CELLULAR THERAPEUTIC APPROACH, REPROGRAMMING OF ORDINARY CELLS INTO STEM CELLS, THROUGH A COMBINATION OF READINGS, PENETRATING DISCUSSIONS, AND ANIMATION OF NEW TECHNIQUES AND TOOLS (SHORT MOVIES).

PREREQUISITES *: NONE

COREQUISITES*: NONE

REGISTRATION CONTROLS (MAJOR, COLLEGE, LEVEL)*:
GRADUATE STUDENTS IN COMPUTER ENGINEERING, COMPUTER SCIENCE, 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] N/A

Approved by:	Date:
Department Chair: [signature]	11/27/13
College Curriculum Chair: [signature]	11/27/13
College Dean: [signature]	12/2/13
UGPC Chair: [signature]	1/22/15
Graduate College Dean: [signature]	1-30-14
UFS President:	
Provost:	

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.

FAUnewcrseGrad—Revised September 2013

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

1. Course title/number, number of credit hours	
Stem Cell Engineering BME~~6XXX~~ 6324	# of credit hours:3
2. Course prerequisites, corequisites, and where the course fits in the program of study	
No prerequisites	
3. Course logistics	
Term: TBA This is a classroom lecture course *Class location and time: TBA* This course has limited design content.	
4. Instructor contact information	
Instructor's name *Office address* *Office Hours* *Contact telephone number* *Email address*	Mirjana D. Pavlovic, MD, PhD EE-96 # 515 TBA 561-297-2348 mpavlovi@fau.edu; Pmirjana@aol.com
5. TA contact information	
TA's name	None
6. Course description	
This course will focus on the stem cell's research and engineering/application in its endeavor to clarify the nature of these cells; their sources, categories; engineering of these cells for different purposes, their role as novel cellular therapeutic approach, reprogramming of ordinary cells into stem cells, through an exciting combination of readings, penetrating discussions, and animation of new techniques and tools (short movies). This course enhances students' understanding of human ordinary stem cells and cancer stem cells, clarifies what is stemness, elevates student's experience through the search and study of literature resources and the use of modern technologies and tools, piques their intellectual curiosity in the complex science of stem cells, and helps to guide them in matching their interests to their academic pursuits.	
7. Course objectives/student learning outcomes/program outcomes	
Course objectives	The class lectures will cover both conceptual and practical aspects. Furthermore, this course will help each student to develop logical thinking, balanced skepticism, tolerance for ambiguity and uncertainty, and a knowledge and appreciation of the stem cell world in all its richness and complexity. Students will understand that it is at the intersection of disciplines where the grand challenges are found and differences resolved. They will realize that stem cell engineering is the basic aspect of integral thinking in bioengineering as a novel, modern scientific field. The ultimate goal is to show them that it requires integral knowledge and involves essential principles of basic sciences including :biology, physics, chemistry and mathematics. At the completion of this course, each student will be able to: • Better understand scientific, engineering, therapeutic views of stem cell phenomenology, including recent theories of complexity in their cellular therapies in scientific community. • Understand and be able to apply models of dynamics, evolution, engineering and reprogramming within stem cell entities.

	• Compare similarities and differences between stem cell renewal and differentiation and be able to design and conduct experiments and analyze the data • Consider and reflect upon the ethical and social consequences of the various models used in cellular treatments and apply them in practice • Consider and reflect upon the implications of the mobilization, harvesting, stem cell transplant and engraftment in this system • Name principles and practice of stem cell cryopreservation • Know the basics of cancer stem cell concepts and engineering of targeted cancer stem cell therapy Recognize the need for, and be able to engage in life-long learning Get a knowledge on contemporary issues ion this subject Gain ability to use the techniques, skills and modern stem cell engineering tools necessary for the practice Improve individual and team work and gain idea on many laboratory-related techniques

8. Course evaluation method

Projects -	20%
Homework -	60 %
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

Exams will be given only at the scheduled times and places. No one is exempt from the final examination.
Makeup exams are given only if there is solid evidence of a medical or otherwise serious emergency that prevented the student from participating in the exam. *Late work* is not acceptable.
A grade of *incomplete* will be assigned only in the case of solid evidence of medical or otherwise serious emergency situation.
Attendance to class is required. You are expected to attend and participate in all class sessions.
Final grades will be reduced by one letter for every three (3) unexcused absences (as determined by the Instructor).

11. Special course requirements

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

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.
URL to be added

14. Honor code policy

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

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

15. Required texts/reading

1. Mirjana Pavlovic and Bela Balint: Stem Cells and Tissue Engineering (Springer Briefs in Electrical and Computer Engineering),NY, Heidelberg, 2013

   ISSN: 2191-8120 (electronic)

   ISBN: 978-1-4614-5505-9 (printed)

16. Supplementary/recommended readings

Will be given at class, dependent on student's interest

17. Course topical outline, including dates for exams/quizzes, papers, completion of reading

Topics and # of 1.5 hr classes (approximation) :

1. **Introduction (1)**
2. **Stem Cell Concept (2)**
3. **Embryonic Stem Cells (1)**
4. **Adult (Tissue's) Stem cells (1)**
5. **Cord blood Stem cells (1)**
6. **Hematopoietic Stem cells (1)**
7. **Ethical aspects of stem cell research (1)**
8. **Stem Cell Renewal and Differentiation (1)**
9. **Stem Cell Sources, Harvesting and Clinical Use (2)**
10. **HLA Typization : Choice of Donors (1)**
11. **Peritransplant blood component therapy (1)**
12. **Engraftment: homing and use of genetic markers (1)**
13. **Principles and practice of stem cell cryopreservation (2)**
14. **Cord Blood cryopreservation (1)**
15. **Stem cell expansion (1)**
16. **Current status and perspectives in Stem cell research : the concept of Cancer stem cell (2)**
17. **Stem cell therapy: optimization, regeneration, reprograming ,Tissue Engineering (TE) (4)**
18. **Cellular therapy/engineering: Heart stem cell therapy (1)**
19. **Neurological diseases and stem cell therapy (1)**
20. **Presentations (4)**
21. **Final Exam**

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
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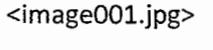
Website: http://www.fau.edu/research



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