

 FLORIDA ATLANTIC UNIVERSITY	NEW COURSE PROPOSAL Undergraduate Programs		UUPC Approval <u>2-28-22</u> UFS Approval _____ SCNS Submittal _____ Confirmed _____ Banner Posted _____ Catalog _____
	Department Electrical Engineering and Computer Science College Engineering and Computer Science <i>(To obtain a course number, contact erudolph@fau.edu)</i>		
Prefix BME Number 4512	<i>(L = Lab Course; C = Combined Lecture/Lab; add if appropriate)</i> Lab Code	Type of Course <div style="border: 1px solid red; padding: 2px;">Lecture</div>	Course Title Introduction to Bioluminescence
Credits <i>(Review Provost Memorandum)</i> 3	Grading <i>(Select One Option)</i> Regular <input checked="" type="radio"/> Pass/Fail <input type="radio"/> Sat/UnSat <input type="radio"/>	Course Description <i>(Syllabus must be attached; Syllabus Checklist recommended; see Guidelines)</i> The course fits within the goals of the school to foster and facilitate interdisciplinary research, and it will provide students with the necessary fundamental concepts to do research in biomedical imaging. Topics of the course will cover, image characteristics, Fourier transforms, image acquisition, image processing and analysis, convolution, sampling, resolution, contrast, filtering; principle of imaging tools such as radiography; CT; ultrasound; MRI and optical imaging.	
Effective Date <i>(TERM & YEAR)</i> Fall 2022	Prerequisites, with minimum grade* EEL 3502 Signals and Digital Filter Design with minimum grade of "C" or permission from instructor		Corequisites _____
		Registration Controls <i>(Major, College, Level)</i> _____	
*Default minimum passing grade is D-. Prereqs., Coreqs. & Reg. Controls are enforced for all sections of course			
WAC/Gordon Rule Course <input type="radio"/> Yes <input checked="" type="radio"/> No WAC/Gordon Rule criteria must be indicated in syllabus and approval attached to proposal. See WAC Guidelines .		Intellectual Foundations Program (General Education) Requirement <i>(Select One Option)</i> None General Education criteria must be indicated in the syllabus and approval attached to the proposal. See GE Guidelines .	
Minimum qualifications to teach course PhD in CS, CE or EE or a related field			
Faculty Contact/Email/Phone Hanqi Zhuang, zhuang@fau.edu, 5612973413		List/Attach comments from departments affected by new course _____	
Approved by Department Chair _____ College Curriculum Chair <u>Hongbo Su</u> College Dean _____ UUPC Chair <u>Eblyn Williams</u> Undergraduate Studies Dean <u>Daniel Meeroff</u> UFS President _____ Provost _____		Date 11/8/21 <u>2-12-22</u> 2-28-22 2-28-22 _____ _____	

Email this form and syllabus to mjenning@fau.edu seven business days before the UUPC meeting.

Department of Electrical Engineering and Computer Science
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Course Syllabus

1. Course title/number, number of credit hours	
Introduction to Bioluminescence - BME 4512	3 credit hours
2. Course prerequisites, corequisites, and where the course fits in the program of study	
Prerequisites: EEL 3502 Signals and Digital Filter Design with minimum grades of "C" or permission from instructor	
3. Course logistics	
Term: TBD Class location and time:	
4. Instructor contact information	
<i>Instructor's name</i>	Mahsa Ranji
<i>Office address</i>	EE 513
<i>Office Hours</i>	TBD
<i>Contact telephone number</i>	TBD
<i>Email address</i>	mranji@fau.edu
5. TA contact information	
<i>TA's name</i>	TBD
<i>Office address</i>	
<i>Office Hours</i>	
<i>Contact telephone number</i>	
<i>Email address</i>	
6. Course description	
Provide students of engineering and science with an introduction to the physical and signal processing aspects of biomedical imaging systems.	
7. Course objectives/student learning outcomes/program outcomes	
<i>Course objectives</i>	The course fits within the goals of the school to foster and facilitate interdisciplinary research, and it will provide students with the necessary fundamental concepts to do research in biomedical imaging. Topics of the course will cover, image characteristics, Fourier transforms, image acquisition, image processing and analysis, convolution, sampling, resolution, contrast, filtering; principle of imaging tools such as radiography; CT; ultrasound; MRI and optical imaging.
<i>Student learning outcomes & relationship to ABET 1-7 outcomes</i>	TBD
8. Course evaluation method	
<ul style="list-style-type: none"> • 10 Homework Assignments (30%). • Exams (35% each), non-cumulative • Midterm (35%); Final (35%) 	
9. Course grading scale	

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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

Students must turn in homework on time. Students will lose 25% (after 1 day) and 50% of marks (after 2 days) if they turn in late. Submissions are not accepted after 3rd day of due date.

Students are strongly suggested to inform the instructor in advance in the case of emergency (if possible) for exam attendance. Makeup exams are given only if there is solid evidence of a medical or otherwise serious emergency that prevents the student of participating in the exam.

11. Special course requirements

N/A

12. Classroom etiquette policy

To enhance and maintain a productive atmosphere for learning, personal communication devices such as cell phones are to be disabled during class sessions.

13. Attendance policy statement

Students are expected to attend all of their scheduled University classes and to satisfy all academic objectives as outlined by the instructor. The effect of absences upon grades is determined by the instructor, and the University reserves the right to deal at any time with individual cases of non-attendance.

Students are responsible for arranging to make up work missed because of legitimate class absence, such as illness, family emergencies, military obligation, court-imposed legal obligations or participation in University-approved activities. Examples of University-approved reasons for absences include participating on an athletic or scholastic team, musical and theatrical performances and debate activities. It is the student's responsibility to give the instructor notice prior to any anticipated absences and within a reasonable amount of time after an unanticipated absence, ordinarily by the next scheduled class meeting. Instructors must allow each student who is absent for a University-approved reason the opportunity to make up work missed without any reduction in the student's final course grade as a direct result of such absence.

Special note: *"After two full weeks of face to face instruction with consecutive 'no show' of any students in person in the classroom, the modality of this course section may be changed to remote instruction only at the discretion of the university."*

14. Disability policy statement

In compliance with the Americans with Disabilities Act Amendments Act (ADAAA), students who require reasonable accommodations due to a disability to properly execute coursework must register with Student Accessibility Services (SAS) and follow all SAS procedures. SAS has offices across three of FAU's campuses – Boca Raton, Davie and Jupiter – however disability services are available for students on all campuses. For more information, please visit the SAS website at www.fau.edu/sas/.

15. Counseling and Psychological Services (CAPS) Center

Life as a university student can be challenging physically, mentally and emotionally. Students who find stress negatively affecting their ability to achieve academic or personal goals may wish to consider utilizing FAU's Counseling and Psychological Services (CAPS) Center. CAPS provides FAU students a range of services – individual counseling, support meetings, and psychiatric services, to name a few – offered to help improve and maintain emotional well-being. For more information, go to <http://www.fau.edu/counseling/>.

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16. Code of Academic Integrity policy statement	
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 an unfair advantage over any other. Academic dishonesty is also destructive of the university community, which is grounded in a system of mutual trust and places high value on personal integrity and individual responsibility. Harsh penalties are associated with academic dishonesty. For more information, see University Regulation 4.001 .	
17. Required texts/reading	
<ol style="list-style-type: none"> 1) <i>Introduction to Biomedical Imaging</i>, Andrew Webb, Wiley Inter-Science 2003. (required) 2) <i>Medical Imaging Signals and Systems</i>, 2nd edition Jerry L. Prince and Johnathan M. Links, Prentice Hall, 2015. (recommended) 	
18. Supplementary/recommended readings	
Lecture notes.	
19. Course topical outline (and associated readings)	
Week - 1	Introduction to imaging, Image characteristics (contrast, resolution, accuracy)
Week - 2	Image Characteristics/ Image Processing and Analysis
Week - 3	Image Processing and Analysis
Week - 4	Fourier Transforms in Spatial Domain
Week - 5	Sampling, Filtering of 2D/3D images
Week - 6	Projection Radiography (x ray production and imaging)
Week - 7	Computed Tomography (Radon Transform and reconstruction)
Week - 8	Review, exam 1
Week - 9	Sound wave propagation, Reflection/Transmission
Week - 10	MRI (physics of magnetic resonance, magnetization, relaxation)
Week - 11	MRI (Spin echoes, T ₁ /T ₂ contrast mechanisms)
Week - 12	Tissue Optics
Week - 13	Optical Imaging
Week - 14	Applications/Review