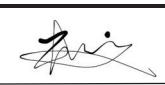

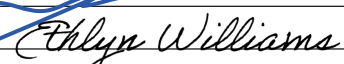

 FLORIDA ATLANTIC UNIVERSITY	NEW COURSE PROPOSAL Undergraduate Programs		UUPC Approval <u>10/10/22</u> UFS Approval _____ SCNS Submittal _____ Confirmed _____ Banner Posted _____ Catalog _____
	Department Electrical Engineering and Computer Science College Engineering & Computer Science <i>(To obtain a course number, contact erudolph@fau.edu)</i>		
Prefix BME Number 4503	<i>(L = Lab Course; C = Combined Lecture/Lab; add if appropriate)</i> Lab Code C	Type of Course <div style="border: 1px solid red; padding: 2px;">Lecture</div>	Course Title Biomedical Instrumentation and Measurements
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> This course covers design of biomedical instrumentation and diagnostic devices (aspects of electronic, mechanics, chemical and biological components) to measure physiological parameters. It also covers design of diagnostic devices and methods for point-of-care detection of biomarkers in tissue.	
Effective Date <i>(TERM & YEAR)</i> Spring 2023	Prerequisites, with minimum grade* EEL 3502 Signals and Digital Filters with minimum grade of "C"		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 <small>WAC/Gordon Rule criteria must be indicated in syllabus and approval attached to proposal. See WAC Guidelines.</small>		Intellectual Foundations Program (General Education) Requirement <i>(Select One Option)</i> None <small>General Education criteria must be indicated in the syllabus and approval attached to the proposal. See GE Guidelines.</small>	
Minimum qualifications to teach course MS in CS, CE, EE			
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 Hongbo Su College Dean  UUPC Chair  Undergraduate Studies Dean  UFS President _____ Provost _____		Date 5/6/2022 <u>9/30/22</u> 10/10/22 10/10/22 _____ _____	

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

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1. Course title/number, number of credit hours	
Biomedical Instrumentation and Measurements – BME 4503C	3 credit hours
2. Course prerequisites, corequisites, and where the course fits in the program of study	
Prerequisites: EEL 3502 Signals and Digital Filters	
3. Course logistics	
Term: TBD Class location and time:	
4. Instructor contact information	
Instructor's name Office address Office Hours Contact telephone number Email address	TBD
5. TA contact information	
TA's name Office address Office Hours Contact telephone number Email address	TBD
6. Course description	
This course covers design of biomedical instrumentation and diagnostic devices (aspects of electronic, mechanics, chemical and biological components) to measure physiological parameters. It also covers design of diagnostic devices and methods for point-of-care detection of biomarkers in tissue.	
7. Course objectives/student learning outcomes/program outcomes	
Course objectives	This course will introduce the student to the bases of biomedical instrumentation and the acquisition of physiological signals. <ul style="list-style-type: none"> • Identify the design blocks of a biomedical instrument/measuring device • Characterize sensors • Describe instrumentation regulation and safety considerations
Student learning outcomes & relationship to ABET 1-7 outcomes	TBD
8. Course evaluation method	
<ul style="list-style-type: none"> • 6 Homework Assignments (calculations and MATLAB simulations); 2 Labs (30%) • Exams (35% each), non-cumulative • Midterm (35%); Final (35%) 	
9. Course grading scale	

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A	A-	B+	B	B-	C+	C	C-	D+	D	D-	F
[90-100]	[87-90]	[83-87]	[80-83]	[77-80]	[73-77]	[70-73]	[67-70]	[63-67]	[60-63]	[51-60]	[0-51]
10. Policy on makeup tests, late work, and incompletes											
<p>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.</p> <p>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.</p>											
11. Special course requirements											
N/A											
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. Attendance policy statement											
<p>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. 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.</p> <p>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 grade as a direct result of such absence.</p>											
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

Medical Instrumentation: Application and Design, 4th edition by John G. Webster

18. Supplementary/recommended readings

Lecture notes.

19. Course topical outline (and associated readings)

Week - 1	Introduction/Characteristics of Measurement Systems
Week - 2	Basics of medical instrumentation
Week - 3	Data Acquisition basics/Biopotential
Week - 4	Biosensors
Week - 5	Biomarkers used in Diagnostics
Week - 6	Examples of biological signal measurement/ Measurement of ECG and EEG Signals
Week - 7	Blood Pressure and Flow Measurements
Week - 8	Review, exam 1
Week - 9	Fundamentals of Electrochemical Measurements
Week - 10	Measurement of Liquid and Gas Flows Light and Spectrophotometry
Week - 11	Mechanical Transducers Pressure, Motion, and Force Measurement
Week - 12	Point-of-care Diagnostic Systems
Week - 13	Wearable Devices/ instrumentation regulation and safety considerations
Week - 14	Applications/Review