

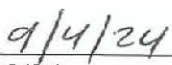


 FLORIDA ATLANTIC UNIVERSITY	NEW COURSE PROPOSAL Graduate Programs		UGPC Approval _____ UFS Approval _____ SCNS Submittal _____ Confirmed _____ Banner _____ Catalog _____	
	Department Biomedical Engineering College Engineering and Computer Science (To obtain a course number, contact erudolph@fau.edu)			
Prefix BME Number 5205	(L = Lab Course; C = Combined Lecture/Lab; add if appropriate) Lab Code	Type of Course Lecture	Course Title Orthopedic Biomechanics	
Credits (See Definition of a Credit Hour) 3	Grading (Select One Option) Regular <input checked="" type="radio"/> Sat/UnSat <input type="radio"/>	Course Description (Syllabus must be attached; see Template and Guidelines) This advanced course delves deeper into orthopedic biomechanics, focusing on complex mechanical behavior, advanced 3D modeling, surgical applications, and the latest research in the field. Covering the spine, shoulder, hand, hip, knee, ankle, feet, and head, students will engage with both theoretical concepts and hands-on projects. Special emphasis is placed on 3D printing, biomechanical simulations, and designing innovative solutions for orthopedic challenges. Graduate students will be expected to complete rigorous projects, research papers, and presentations on advanced topics.		
Effective Date (TERM & YEAR) Spring 2025				
Prerequisites Undergraduate course in Biomechanics or equivalent or instructor's permission. <i>Prerequisites, Corequisites and Registration Controls are enforced for all sections of course.</i>		Academic Service Learning (ASL) course <input type="checkbox"/> Academic Service Learning statement must be indicated in syllabus and approval attached to this form.		
		Corequisites N/A	Registration Controls (For example, Major, College, Level) BME, COECS, Graduate	
Minimum qualifications needed to teach course: Member of the FAU graduate faculty and has a terminal degree in the subject area (or a closely related field.)		List textbook information in syllabus or here Basic Biomechanics of the Musculoskeletal System by Margareta Nordin and Victor H. Frankel.		
Faculty Contact/Email/Phone Maohua Lin/mlin2014@fau.edu		List/Attach comments from departments affected by new course There is no other course affected.		

Approved by Department Chair  College Curriculum Chair Francisco Presuel-Moreno College Dean  UGPC Chair _____ UGC Chair _____ Graduate College Dean _____ UFS President _____ Provost _____	Date  9/23/24 9/21/24 _____ _____ _____ _____ _____
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Email this form and syllabus to UGPC@fau.edu 10 days before the UGPC meeting.

Orthopedic Biomechanics

TBD
3 credits

Spring 2025
Prof. Maohua Lin
Classroom: TBD
Office: TBD
Telephone:

Email: mmlin2014@fau.edu



Office instructor/TA	TBD
TA Office hours	TBD
TA email:	TBD
Telephone	
Email	mmlin2014@fau.edu

Course Description

This advanced course delves deeper into orthopedic biomechanics, focusing on complex mechanical behavior, advanced 3D modeling, surgical applications, and the latest research in the field. Covering the spine, shoulder, hand, hip, knee, ankle, feet, and head, students will engage with both theoretical concepts and hands-on projects. Special emphasis is placed on 3D printing, biomechanical simulations, and designing innovative solutions for orthopedic challenges. Graduate students will be expected to complete rigorous projects, research papers, and presentations on advanced topics.

Instructional Method

This class is designated as one mode: In person. Attendance: Optional but highly recommended.

Prerequisites/Corequisites

- Undergraduate course in Biomechanics or equivalent or instructor's permission.

Building: TBD
Room: TBD
Days: TBD
Time: 12:30 – 1:50pm

Course Evaluation Method

- Midterm Exam: 20%
- Final Exam: 20%
- Laboratory Reports: 10%
- Graduate Research Project: 30% (Research, simulation, and final presentation)
- Research Paper and Peer Critique: 20%

Course Grading Scale

Grade 90 and above: "A", 86-89: "A-", 82-85: "B+", 78-81: "B", 74-77 : "B-", 73-76: "C+", 69-72: "C", 65-68: "C-", 61-64: "D+", 57-60: "D", 51-56: "D-", 50 and below: "F."

Policy on Makeup Tests, Late Work, and Incompletes (if applicable)

Homework due one week after assignment in class. Late homework is accepted after one day with 50% penalty and not accepted after that unless there is a justifiable reason for late submission.

Classroom Etiquette Policy (if applicable)

Class attendance optional but recommended.

Attendance Policy

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.

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/>

Disability Policy

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/.

Code of Academic Integrity

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](#).

Required Texts/Readings

- *Basic Biomechanics of the Musculoskeletal System* by Margareta Nordin and Victor H. Frankel.
- *Orthopaedic Biomechanics: Mechanics and Design in Musculoskeletal Systems* by Donald Bartel, Dwight Davy, and Tony Keaveny.
- *Orthopedic Biomechanics: Analyzing Human Movement and Design of Human Devices* by Paul Brinckmann.

Tentative Topical Outline

- **Weeks 1-2:** Overview of Advanced Orthopedic Biomechanics; Complex Spine Biomechanics.
- **Weeks 3-4:** Surgical Techniques for the Spine; Simulation and Analysis of Spinal Implants.
- **Weeks 5-6:** Advanced Shoulder Biomechanics; Research in Rotator Cuff and Joint Disorders.
- **Weeks 7-8:** 3D Modeling, Simulation, and Fabrication for Shoulder Reconstruction.
- **Weeks 9-10:** Hand and Wrist Biomechanics; Pathologies and Surgical Interventions.

- **Weeks 11-12:** Advanced 3D Printing Applications for Hand and Wrist.
- **Weeks 13-14:** Hip/ Knee/ Ankle Biomechanics and Replacement; Joint Mechanics and Gait Analysis.

Mahsa Ranji

From: Mahsa Ranji
Sent: Wednesday, October 16, 2024 4:06 PM
To: Pierre-Philippe Beaujean
Cc: Javad Hashemi
Subject: RE: Finite Element Analysis in BME
Attachments: BME5205_AdvancedOrthopedicsBiomechanics.pdf

Dear Pierre,

I need to send you one more BME course, BME 5205, Advanced Orthopedic Biomechanics. Please send us your approvals or any feedback by Oct 21st or we assume that all is good.

Best,
Mahsa

Mahsa Ranji, Ph.D.
Professor and BME Associate Chair
BME and EECS Dept.
ISENSE & SNBI Fellow
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Tel: (561)-297-0089

IEEE senior editor: <https://www.embs.org/jtehm/editorial-board/>
Biophotonics lab director: <https://www.fau.edu/engineering/research/biophotonics/>



BIOPHOTONICS LAB

From: Mahsa Ranji
Sent: Wednesday, October 16, 2024 12:08 PM
To: Pierre-Philippe Beaujean <PBEAUJEA@fau.edu>
Cc: Javad Hashemi <jhashemi@fau.edu>
Subject: Finite Element Analysis in BME

Dear Dr. Beaujean,

As you may know BME is developing a new course, Advanced Finite Element Analysis in BME. Please see the attached information and let me know if you have any feedback by Oct 21st. If we don't hear back from you, we assume OME doesn't have any objections about this.

Best regards,
Mahsa

Mahsa Ranji, Ph.D.

Professor and BME Associate Chair
BME and EECS Dept.
ISENSE & SNBI Fellow
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Tel: (561)-297-0089

IEEE senior editor: <https://www.embs.org/jtehm/editorial-board/>

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BIOPHOTONICS LAB