FAU

FLORIDA ATLANTIC UNIVERSITY

NEW COURSE PROPOSAL

Graduate Programs

Department Biomedical Engineering

College Engineering and Computer Science (To obtain a course number, contact erudolph@fau.edu)

UGPC Approval
UFS Approval
SCNS Submittal
Confirmed
Banner
Catalog

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Prefix BME Number 5205	(L = Lab Course; C = Combined Lecture/Lab; add if appropriate) Lab Code	Type of Course Lecture	Course Title Advanced Orthop	oedic Biomechanics
Credits (See Definition of a Credit Hour) 3 Effective Date (TERM & YEAR) Spring 2025	Grading (Select One Option) Regular Sat/UnSat	Guidelines) This advanced cour complex mechanicathe latest research ankle, feet, and heathands-on projects. simulations, and de Graduate students	Course Description (Syllabus must be attached; see Guidelines) This advanced course delves deeper into orthopedic biomomplex mechanical behavior, advanced 3D modeling, so the latest research in the field. Covering the spine, should inkle, feet, and head, students will engage with both the chands-on projects. Special emphasis is placed on 3D principulations, and designing innovative solutions for orthoperaduate students will be expected to complete rigorous papers, and presentations on advanced topics.	
Prerequisites Undergraduate course in Biomechanics or equivalent or instructor's permission. Prerequisites, Corequisites and Registration Controls are enforced for all sections of course. 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.) Faculty Contact/Email/Phone			to this form.	st be indicated in syllabus and Registration Controls (For xample, Major, College, Level) BME, COECS, Graduate
		List textbook information in syllabus or here Basic Biomechanics of the Musculoskeletal System by Margareta Nordin and Victor H. Frankel. List/Attach comments from departments affected by new course		
Maohua Lin/mlin2014@fau.edu		NA.		

Approved by mach luli	Date
Department Chair	9/4/24
College Curriculum Chair Francisco Presuel-Moreno Optimi riguedo ly francis presu home no optimi riguedo ly francis presu home no optimi riguedo presu constante una versito, ou, emailimpresu listra edu, optimi riguedo presu constante una versito, ou, emailimpresu listra edu, optimi riguedo presu constante una versito presu constante una	9/23/24
College Dean Raquel Assis	9/21/24
UGPC Chair ————————————————————————————————————	
UGC Chair ————————————————————————————————————	E 2
Graduate College Dean	
UFS President	
Provost	

Email this form and syllabus to $\underline{\text{UGPC@fau.edu}}\ 10$ days before the UGPC meeting.



Office instructor/TA TBD
TA Office hours TBD
TA email: TBD
Telephone

Telephone Email

mlin2014@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 <u>University Regulation 4.001</u>.

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.