FLORIDA ATLANTIC UNIVERSITY

COURSE CHANGE REQUEST
Undergraduate Programs

Department Biomedical Engineering

College COECS

UUPC Approval _____
UFS Approval _____
SCNS Submittal _____
Confirmed _____
Banner Posted _____
Catalog _____

***Current* Course Prefix and Number**	BME 4201	***Current* Course Title**	Orthopedic Biomechanics

*Syllabus must be attached for **ANY** changes to current course details. See Template. Please consult and list departments that may be affected by the changes; attach documentation.*

Change title to:

Change prefix

From: **To:**

Change course number

From: **To:**

Change credits*

From: **To:**

Change grading

From: **To:**

Change WAC/Gordon Rule status**

Add ☐ **Remove** ☐

Change General Education Requirements***

Add ☐ **Remove** ☐

*See Definition of a Credit Hour.

**WAC/Gordon Rule criteria must be indicated in syllabus and approval attached to this form. See WAC Guidelines.

***GE criteria must be indicated in syllabus and approval attached to this form. See Intellectual Foundations Guidelines.

Change description to:

Change prerequisites/minimum grades to: From

From EGN3321, BSC 2085 and BSC 2085L to EGN 1111C Engineering Graphics

Change corequisites to:

Change registration controls to:

Please list existing and new pre/corequisites, specify AND or OR and include minimum passing grade (default is D-).

Effective Term/Year for Changes:	Fall 2026	**Terminate course? Effective Term/Year for Termination:**	

Faculty Contact/Email/Phone Javad Hashemi / jhashemi@fau.edu / 7-3438

Approved by		***Date***
Department Chair	Javad Hashemi	1/14/26
College Curriculum Chair	Galan Liu	1/14/26
College Dean		1/15/26
UUPC Chair		
Undergraduate Studies Dean		
UFS President		
Provost		

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

FLORIDA ATLANTIC UNIVERSITY

BME 4201

Orthopedic Biomechanics

Date: Spring 2026 W/F 12:30 PM - 01:50 PM

Building: Boca Raton Campus | Fleming Hall Boca

Room: 404

3 Credit(s)

Instructor Information

Instructor: Maohua Lin

Email: mlin2014@fau.edu

Office: Engineering West Room 108

Office Hours: W/F 2:20PM-3:20PM

TA: Rudy Paul

Email: paulr2017@fau.edu

Course Description

This course provides an in-depth exploration of orthopedic biomechanics, focusing on the mechanical behavior and function of key joints, including the spine, shoulder, hand, hip, knee, ankle, feet, and head. Emphasizing the integration of biomechanical theory with practical application, the course covers current surgical techniques, advanced 3D modeling, and 3D printing methods specific to orthopedic structures. By the end of the course, students will be equipped with both theoretical knowledge and hands-on skills relevant to careers in biomedical engineering, orthopedics, and related fields.

- **Weeks 1-2**: Overview of Advanced Orthopedic Biomechanics; Complex Spine Biomechanics.
- **Weeks 3-4**: Surgical Techniques for the Spine; AI FEA for Spinal Implants.
- **Weeks 5-6**: Advanced Shoulder Biomechanics; Research in Rotator Cuff and Joint Disorders.
- **Weeks 7-8**: AI, 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.

Prerequisites/Corequisites

Prerequisite(s): The following course:

- Engineering Graphics (EGN 1111C)
- Strong foundation in human anatomy, physiology, and mechanical principles.

Required Texts/Materials

- *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.

Course Objectives/Student Learning Outcomes

Course Objectives:

- To deepen understanding of the biomechanics of key joints, including their anatomical structures and functional dynamics.
- To analyze and assess the mechanical behavior of orthopedic structures under various conditions.
- To familiarize students with contemporary surgical techniques used for each joint.
- To develop proficiency in 3D modeling, printing, and fabrication technologies as applied to orthopedic biomechanics.
- To synthesize biomechanical theory with practical, real-world fabrication techniques.

Learning Outcomes: Upon successful completion of this course, students will be able to:

- Demonstrate a thorough understanding of the biomechanics of major joints and orthopedic regions.
- Apply principles of mechanics to evaluate the structural integrity and function of orthopedic joints.
- Utilize diagnostic imaging tools, such as CT scans, for 3D modeling of orthopedic structures.
- Design, fabricate, and evaluate models of orthopedic joints using 3D printing technologies.
- Critically assess the biomechanical outcomes of various surgical interventions.

Faculty Rights and Responsibilities

Florida Atlantic University respects the rights of instructors to teach and students to learn. Maintenance of these rights requires classroom conditions that do not impede their exercise. To ensure these rights, faculty members have the prerogative to:

• Establish and implement academic standards.

• Establish and enforce reasonable behavior standards in each class.

• Recommend disciplinary action for students whose behavior may be judged as disruptive under the Student Code of Conduct University Regulation 4.007.

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/.

Course Evaluation Method

- **Midterm Exam:** 20% (assessing theoretical knowledge and understanding of biomechanics)
- **Final Exam:** 30% (comprehensive assessment covering all course material)
- **Laboratory Reports:** 20% (evaluation of practical lab work and 3D modeling proficiency)
- **Final Project:** 30% (integrative project applying course concepts to a real-world biomechanical problem)

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.

Attendance Policy Statement

Students are expected to attend all 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 fora 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.

- Late Submission Policy: Assignments submitted after the deadline will incur a deduction of 10% per day, up to a maximum of three days.

- Academic Integrity: Plagiarism and unauthorized collaboration will result in severe consequences as per the university's academic integrity policy.

Religious Accommodation Policy Statement

In accordance with the rules of the Florida Board of Education and Florida law, students have the right to reasonable accommodations from the University in order to observe religious practices and beliefs regarding admissions, registration, class attendance, and the scheduling of examinations and work assignments. University Regulation 2.007, Religious Observances, sets forth this policy for FAU and may be accessed on the FAU website at www.fau.edu/regulations.

Any student who feels aggrieved regarding religious accommodations may present a grievance to the executive director of The Office of Civil Rights and Title IX. Any such grievances will follow Florida Atlantic University's established grievance procedure regarding alleged discrimination.

Time Commitment Per Credit Hour

For traditionally delivered courses, not less than one (1) hour of classroom or direct faculty instruction each week for fifteen (15) weeks per Fall or Spring semester, and a minimum of two (2) hours of out-of-class student work for each credit hour. Equivalent time and effort are required for Summer Semesters, which usually have a shortened timeframe. Fully Online courses, hybrid, shortened, intensive format courses, and other non-traditional modes of delivery will demonstrate equivalent time and effort.

Course Grading Scale

Letter Grade	Letter Grade

Letter Grade	Letter Grade
A	94 - 100%
A-	90 - 93%
B+	87 - 89%
B	83 - 86%
B-	80 - 82%
C+	77 - 79%
C	73 - 76%
C-	70 - 72%
D+	67 - 69%
D	63 - 66%
D-	60 - 62%
F	Below 60

Grade Appeal Process

You may request a review of the final course grade when you believe that one of the following conditions apply:

• There was a computational or recording error in the grading.

• The grading process used non-academic criteria.

• There was a gross violation of the instructor's own grading system.

University Regulation 4.002 of the University Regulations contains information on the grade appeals process

Policy on Make-up Tests, Late work, and Incompletes

1. Make-up Tests:

- Make-up tests will be considered under exceptional circumstances, such as medical emergencies, family emergencies, or other unforeseen events. Students are required to notify the instructor as soon as possible and provide appropriate documentation.

- Make-up tests must be scheduled within a reasonable timeframe, typically within one week of the original test date. The format and content of the make-up test may differ from the original to maintain fairness.

- Failure to notify the instructor in a timely manner or provide valid documentation may result in the forfeiture of the opportunity for a make-up test.

2. Late Work:

- Late submissions will be accepted, but a penalty will be applied for each day of delay. The penalty will be clearly communicated in the course syllabus. It is the responsibility of the student to be aware of and adhere to the deadlines.

- In cases of extenuating circumstances, such as documented medical issues or family emergencies, students may request an extension before the due date. The instructor will evaluate such requests on a case-by-case basis.

3. Incompletes:

- The grade of "Incomplete" (I) may be assigned in exceptional cases where a student is unable to complete the coursework by the end of the term due to documented, unforeseen circumstances.

- Students seeking an Incomplete must submit a formal request, including supporting documentation, to the instructor before the end of the term. The instructor will review the request and, if approved, outline a specific timeline for completion of the remaining coursework.

- If the outstanding work is not completed within the agreed-upon timeframe, the Incomplete may be converted to a permanent grade based on the work completed.

General Guidelines:

- Clear communication is crucial. Students are encouraged to communicate proactively with the instructor regarding any anticipated issues related to tests, assignments, or coursework completion.

- All requests for make-up tests, extensions, or incompletes must be submitted in writing and accompanied by appropriate documentation (medical certificates, official statements, etc.).

- The instructor reserves the right to deny requests for make-up tests, extensions, or incompletes if the documentation provided is deemed insufficient or if the circumstances do not meet the criteria outlined in this policy.

Policy on the Recording of Lectures

Students enrolled in this course may record video or audio of class lectures for their own personal educational use. A class lecture is defined as a formal or methodical oral presentation as part of a university course intended to present information or teach students about a particular subject. Recording class activities other than class lectures, including but not limited to student presentations (whether individually or as part of a group), class discussion (except when incidental to and incorporated within a class lecture), labs, clinical presentations such as patient history, academic exercises involving student participation, test or examination administrations, field trips, and private conversations between students in the class or between a student and the lecturer, is prohibited. Recordings may not be used as a substitute for class participation or class attendance and may not be published or shared without the written consent of the faculty member. Failure to adhere to these requirements may constitute a violation of the University's Student Code of Conduct and/or the Code of Academic Integrity.

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/

Student Support Services and Online Resources

- Center for Learning and Student Success (CLASS)
- Counseling and Psychological Services (CAPS)
- FAU Libraries
- Math Learning Center
- Office of Information Technology Helpdesk
- Center for Global Engagement
- Office of Undergraduate Research and Inquiry (OURI)
- Science Learning Center
- Speaking Center
- Student Accessibility Services
- Student Athlete Success Center (SASC)
- Testing and Certification
- Test Preparation

- University Academic Advising Services
- University Center for Excellence in Writing (UCEW)
- Writing Across the Curriculum (WAC)

Artificial Intelligence Preamble

FAU recognizes the value of generative AI in facilitating learning. However, output generated by artificial intelligence (AI), such as written words, computations, code, artwork, images, music, etc., for example, is drawn from previously published materials and is not your own original work.

FAU students are not permitted to use AI for any course work unless explicitly allowed to do so by the instructor of the class for a specific assignment. **[Policy 12.16 Artificial Intelligence]**

Class policies related to AI use are decided by the individual faculty. Some faculty may permit the use of AI in some assignments but not others, and some faculty may prohibit the use of AI in their course entirely. In the case that an instructor permits the use of AI for some assignments, the assignment instructions will indicate when and how the use of AI is permitted in that specific assignment. It is the student's responsibility to comply with the instructor's expectations for each assignment in each course. When AI is authorized, the student is also responsible and accountable for the content of the work. AI may generate inaccurate, false, or exaggerated information. Users should approach any generated content with skepticism and review any information generated by AI before using generated content as-is.

If you are unclear about whether or not the use of AI is permitted, ask your instructor before starting the assignment.

Failure to comply with the requirements related to the use of AI may constitute a violation of the **Florida Atlantic Code of Academic Integrity, Regulation 4.001.**

Proper Citation: If the use of AI is permitted for a specific assignment, then use of the AI tool must be properly documented and cited. For more information on how to properly cite the use of AI tools, visit **https://fau.edu/ai/citation**

AI Flexible: The use of AI to assist in work assigned in this specific course is permitted only for specific assignments as indicated by the instructor. Use must be properly documented and cited per instructor guidelines.