

ENV H 569 A Sp 17: Occupational Biomechanics

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INDE / ENVH 569 – Occupational Biomechanics

Spring 2017

Class Times: Tuesday and Thursday 8:30 – 10:20pm **Room:** Mechanical Engineering Building (MEB) 102 **Credits:** 4

Instructor: Dr. Peter W. Johnson

Office: 4225 Roosevelt Way NE; Rm 120

E-mail: petej@uw.edu

Phone: 206-221-5240

Office Hours: Walk-in or by appointment

Required Text: Occupational Biomechanics, 4th Edition; Don B. Chaffin, Gunnar B Andersson, Bernard J. Martin; John Wiley & Sons, Inc.; 2006; ISBN 0-471-72343-6

Course Description: This graduate level course will meet twice a week. During selected weeks there will be labs where students will learn how to use various types of bioinstrumentation (e.g. Labview Data Acquisition Software, Electromyography, goniometry, 3D Static Strength Prediction Program, Heart Rate Monitors, inclinometers, accelerometers). Homework assignments will primarily consist of conducting simple lab experiments using the various types of bioinstrumentation presented in the class. There will be one take home mid-term and a take home final. To understand the application of occupational biomechanics, students are encouraged to participate in any ongoing data collection project being conducted in any UW Biomechanics labs.

Class Website: <https://canvas.uw.edu/courses/TBD>

Grading: Class Participation 25%, Homework-Labs 25%, Mid-Term 25%, Final 25%

Learning Objectives: By the end of this course you will be able to:

- Understand the structure and function of the musculoskeletal system
- Apply anthropometric methods to biomechanical analyses.
- Understand how a mechanical work capacity evaluation is performed.
- Be familiar with the various types of bioinstrumentation used in occupational biomechanics.
- Be familiar with methods to classify manual work, how to evaluate manual material handling processes and understand biomechanical considerations in machine control and workplace design.
- Be familiar with the various types of biomechanical models used in occupational biomechanics.

- Understand the important biomechanical concepts which drive hand tool design.
- Be familiar with the biomechanical considerations associated with hand-arm (segmental) and whole body vibration.







Access and Accommodations: Your experience in this class is important to us, and it is the policy and practice of the University of Washington to create inclusive and accessible learning environments consistent with federal and state law. If you experience barriers based on a disability or temporary health condition, please seek a meeting with DRS to discuss and address them. If you have already established accommodations with DRS, please communicate your approved accommodations to your instructor at your earliest convenience so we can discuss your needs in this course.

Disability Resources for Students (DRS) offers resources and coordinates reasonable accommodations for students with disabilities and/or temporary health conditions. Reasonable accommodations are established through an interactive process between you, your instructor(s) and DRS. If you have not yet established services through DRS, but have a temporary health condition or permanent disability that requires accommodations (this can include but not limited to; mental health, attention-related, learning, vision, hearing, physical or health impacts), you are welcome to contact DRS at 206-543-8924 or uwdrs@uw.edu (<mailto:uwdrs@uw.edu>) or [disability.uw.edu](http://depts.washington.edu/uwdrs/) (<http://depts.washington.edu/uwdrs/>)
















Academic Integrity Statement - Students at the University of Washington (UW) are expected to maintain the highest standards of academic conduct, professional honesty, and personal integrity.

The UW School of Public Health (SPH) is committed to upholding standards of academic integrity consistent with the academic and professional communities of which it is a part. Plagiarism, cheating, and other misconduct are serious violations of the University of Washington Student Conduct Code (WAC 478-120). We expect you to know and follow the university's policies on cheating and plagiarism, and the [SPH Academic Integrity Policy](http://sph.washington.edu/students/academicintegrity/) (<http://sph.washington.edu/students/academicintegrity/>). Any suspected cases of academic misconduct will be handled according to University of Washington regulations. For more information, see the University of Washington Community Standards and Student Conduct website

Course Summary:

Date	Details	
Tue Mar 28, 2017	 Introduction to Biomechanics (https://canvas.uw.edu/calendar?event_id=1011056&include_contexts=course_1151205)	8:30am to 9:20am
Thu Mar 30, 2017	 The Musculoskeletal System – Connective Tissue, Bones and Muscle (https://canvas.uw.edu/calendar?event_id=1011068&include_contexts=course_1151205)	9am to 10:20am
Tue Apr 4, 2017	 Anthropometry in Occupational Biomechanics (https://canvas.uw.edu/calendar?event_id=1011057&include_contexts=course_1151205)	9am to 10:20am
Thu Apr 6, 2017	 Mechanical Work Capacity Evaluation (https://canvas.uw.edu/calendar?event_id=1011069&include_contexts=course_1151205)	9am to 10:20am
Tue Apr 11, 2017	 Bioinstrumentation for Occupational Biomechanics (https://canvas.uw.edu/calendar?event_id=1011058&include_contexts=course_1151205)	9am to 10:20am
Thu Apr 13, 2017	 Bioinstrumentation in Occupational Biomechanics (https://canvas.uw.edu/calendar?event_id=1011069&include_contexts=course_1151205)	9am to 10:20am

[event_id=1011070&include_contexts=course_1151205\)](#)

Tue Apr 18, 2017	 Bioinstrumentation for Occupational Biomechanics - Goniometry https://canvas.uw.edu/calendar?event_id=1011059&include_contexts=course_1151205)	9am to 10:30am
Thu Apr 20, 2017	 Bioinstrumentation Incliniometry https://canvas.uw.edu/calendar?event_id=1011071&include_contexts=course_1151205)	9am to 10:30am
Tue Apr 25, 2017	 Goniometry and Incliniometry Lab https://canvas.uw.edu/calendar?event_id=1011060&include_contexts=course_1151205)	9am to 10:20am
Thu Apr 27, 2017	 Tour of the BARC Lab https://canvas.uw.edu/calendar?event_id=1011072&include_contexts=course_1151205)	9am to 10:30am
Tue May 2, 2017	 Biomechanical Modeling https://canvas.uw.edu/calendar?event_id=1011061&include_contexts=course_1151205)	9am to 10:30am
Thu May 4, 2017	 Biomechanical Modelling - 3 dimensional and Low Back https://canvas.uw.edu/calendar?event_id=1011073&include_contexts=course_1151205)	9am to 10:30am
	 EMG Homework https://canvas.uw.edu/courses/1151205/assignments/3729341)	due by 12pm
Tue May 9, 2017	 Untitled https://canvas.uw.edu/calendar?event_id=1011062&include_contexts=course_1151205)	9am to 10:30am
Thu May 11, 2017	 Untitled https://canvas.uw.edu/calendar?event_id=1011074&include_contexts=course_1151205)	9am to 10:30am
Tue May 16, 2017	 Untitled https://canvas.uw.edu/calendar?event_id=1011063&include_contexts=course_1151205)	9am to 10:30am
Thu May 18, 2017	 Untitled https://canvas.uw.edu/calendar?event_id=1011075&include_contexts=course_1151205)	9am to 10:30am
Tue May 23, 2017	 Untitled https://canvas.uw.edu/calendar?event_id=1011064&include_contexts=course_1151205)	9am to 10:30am
Thu May 25, 2017	 https://canvas.uw.edu/calendar?event_id=1011076&include_contexts=course_1151205)	12am
Tue May 30, 2017	 Untitled https://canvas.uw.edu/calendar?event_id=1011065&include_contexts=course_1151205)	9am to 10:30am
Thu Jun 1, 2017	 No Class - Take Home Final https://canvas.uw.edu/calendar?event_id=1011077&include_contexts=course_1151205)	12am