

**STATE UNIVERSITY OF NEW YORK
COLLEGE OF TECHNOLOGY
CANTON, NEW YORK**



MASTER SYLLABUS

HEFI 300 -- Biomechanics

Created by: Dr. Janet L. Parcell Mitchell

SCHOOL OF SCIENCE, HEALTH, AND CRIMINAL JUSTICE
Health and Fitness Promotion
April 2020

A. **TITLE:** Biomechanics

B. **COURSE NUMBER:** HEFI 300

C. **CREDIT HOURS:** 3 credits. 3 hours lecture per week for 15 weeks

D. **WRITING INTENSIVE COURSE:** No

E. **GER CATEGORY:** N/A

F. **SEMESTER(S) OFFERED:** Spring

G. **COURSE DESCRIPTION:** This course provides students the knowledge to analyze and evaluate anatomical and mechanical factors influencing motor skill activities. Musculoskeletal ailments are among the most prevalent disorders in the world, and knowledge and understanding of how to correctly move and exercise is of utmost importance when working with the general population. This course will allow students to acquire a working knowledge of biomechanical principles for use in the field of exercise prescription. This course applies and builds on musculoskeletal anatomy.

H. **PRE-REQUISITES/CO-REQUISITES:**

a. Pre-requisite(s): Pre-requisite: BIOL 217 or permission of instructor

b. Co-requisite(s): N/A

c. Pre- or co-requisite(s): N/A

I. **STUDENT LEARNING OUTCOMES:**

<u>Course Student Learning Outcome [SLO]</u>	<u>PSLO</u>	<u>GER</u>	<u>ISLO</u>
a. Describe biomechanical principles as they apply to each joint (knee, hip, foot/ankle, lumbar spine, cervical spine, shoulder, elbow, wrist/hand)	P4: Capably communicate, orally and in writing, as a health and fitness professional within various health and fitness settings. P8: Utilize knowledge of foundational science and/or business principles to guide decision making in the health and fitness setting.		1. Communication Skills (Written) 5. Industry, Professional, Discipline Specific Knowledge and Skills 2. Critical Thinking (Critical Analysis)

<p>b. Describe functional movement patterns throughout the body in terms of joint motion and muscle activity.</p>	<p>P4: Capably communicate, orally and in writing, as a health and fitness professional within various health and fitness settings.</p> <p>P8: Utilize knowledge of foundational science and/or business principles to guide decision making in the health and fitness setting.</p>		<p>1. Communication Skills (Written)</p> <p>5. Industry, Professional, Discipline Specific Knowledge and Skills</p> <p>2. Critical Thinking (Critical Analysis)</p>
<p>c. Describe components of the gait cycle including joint motions and muscle actions.</p>	<p>P4: Capably communicate, orally and in writing, as a health and fitness professional within various health and fitness settings.</p> <p>P8: Utilize knowledge of foundational science and/or business principles to guide decision making in the health and fitness setting.</p>		<p>1. Communication Skills (Written)</p> <p>5. Industry, Professional, Discipline Specific Knowledge and Skills</p> <p>2. Critical Thinking (Critical Analysis)</p>

KEY	<u>Institutional Student Learning Outcomes [ISLO 1 – 5]</u>
ISLO #	ISLO & Subsets
1	Communication Skills Oral [O], Written [W]
2	Critical Thinking <i>Critical Analysis [CA], Inquiry & Analysis [IA], Problem Solving [PS]</i>
3	Foundational Skills <i>Information Management [IM], Quantitative Lit./Reasoning [QTR]</i>
4	Social Responsibility <i>Ethical Reasoning [ER], Global Learning [GL], Intercultural Knowledge [IK], Teamwork [T]</i>
5	Industry, Professional, Discipline Specific Knowledge and Skills

J. APPLIED LEARNING COMPONENT:

Yes _____

No X _____

- K. TEXTS:**
Nordin, M., & Frankel, V. (2012). *Basic Biomechanics of the Musculoskeletal System, Fourth Edition*. Philadelphia, PA. Lippincott Williams & Wilkins. (ISBN: 978-1-60913-335-1)
- L. REFERENCES: None**
- M. EQUIPMENT:** Technology enhanced classroom. Occasional use of treadmills and treatment tables found in Wicks 214 classroom/lab space.
- N. GRADING METHOD: A-F**
- O. SUGGESTED MEASUREMENT CRITERIA/METHODS:**
Tests
Quizzes
Written Homework
Summary of peer-reviewed journal article
- P. DETAILED COURSE OUTLINE:**
I. Basic Terminology and Concepts
II. Biomechanics of Bone
III. Biomechanics of Articular Cartilage
IV. Biomechanics of Tendons and Ligaments
V. Biomechanics of Skeletal Muscle
VI. Biomechanics of the Knee
VII. Biomechanics of the Hip
VIII. Biomechanics of the Foot and Ankle
IX. Biomechanics of the Lumbar Spine
X. Biomechanics of the Cervical Spine
XI. Biomechanics of the Shoulder
XII. Biomechanics of the Elbow
XIII. Biomechanics of the Wrist and Hand
XIV. Biomechanics of Gait
- Q. LABORATORY OUTLINE: N/A**