



COURSE OUTLINE: FIT125 - INTRO TO BIOMECHANIC

Prepared: Tina Montgomery

Approved: Bob Chapman, Dean, Health

Course Code: Title	FIT125: INTRO TO BIOMECHANICS
Program Number: Name	3040: FITNESS AND HEALTH
Department:	FITNESS & HEALTH PROMOTION
Academic Year:	2023-2024
Course Description:	This course will provide the student with a biomechanical foundation in the principles of normal functional movement, mechanical, anatomical, and physiological aspects of human movement and performance. Essential terminology and concepts related to normal human movement, the articular system, components of movement, biomechanical analysis of movement, and skill acquisition will be introduced. Students will assess, analyze, and develop an understanding of proper posture, gait, and balance mechanics.
Total Credits:	3
Hours/Week:	3
Total Hours:	42
Prerequisites:	FIT111
Corequisites:	There are no co-requisites for this course.
Substitutes:	OPA104
Vocational Learning Outcomes (VLO's) addressed in this course:	3040 - FITNESS AND HEALTH
Please refer to program web page for a complete listing of program outcomes where applicable.	VLO 1 Conduct an assessment of the physical fitness, activity level and lifestyle of the client using standardized protocols, to build an individualized exercise program.
	VLO 2 Develop, implement and evaluate safe training programs grounded in fundamentals of anatomy, bio-mechanics, cardiorespiratory physiology, and nutrition to support the fitness and wellness goals of clients.
	VLO 10 Communicate information persuasively and accurately in oral, written, and other media formats.
Essential Employability Skills (EES) addressed in this course:	EES 1 Communicate clearly, concisely and correctly in the written, spoken, and visual form that fulfills the purpose and meets the needs of the audience.
	EES 2 Respond to written, spoken, or visual messages in a manner that ensures effective communication.
	EES 7 Analyze, evaluate, and apply relevant information from a variety of sources.
	EES 10 Manage the use of time and other resources to complete projects.
	EES 11 Take responsibility for ones own actions, decisions, and consequences.
General Education Themes:	Science and Technology
Course Evaluation:	Passing Grade: 50%, D



A minimum program GPA of 2.0 or higher where program specific standards exist is required for graduation.

Books and Required Resources:

Applied Sport Mechanics by Burkett
 Publisher: Human Kinetics Edition: 4
 ISBN: 9781492558439
 Additional Texts may be used by See the Professor

Course Outcomes and Learning Objectives:

Course Outcome 1	Learning Objectives for Course Outcome 1
Demonstrate an understanding of terminology and concepts related to normal movement of the human body.	1.1 Describe the following aspects of normal functional movement and where appropriate, normal changes across the lifespan: a) motor b) sensory c) cognitive d) perceptual e) psychological f) environmental 1.2 Explain the following biomechanical concepts and the implications of these on normal functional movement: a) weight b) gravity c) force d) leverage e) momentum f) inertia g) equilibrium h) base of support i) center of mass
Course Outcome 2	Learning Objectives for Course Outcome 2
Demonstrate an understanding of the articular system and resulting movement.	2.1 Identify and describe: a) types of joints and associated movements including normal range of motion for each joint b) directional terms (adduction, abduction, extension ect.) 2.2 Identify age related changes of the articular system throughout the lifespan
Course Outcome 3	Learning Objectives for Course Outcome 3
Demonstrate an understanding of the role of muscles in the production of movement.	3.1 Define the following terms: origin, insertion, prime mover/agonist, synergist, fixator 3.2 Describe graded response, tetanus, muscle fatigue and muscle tone as they apply to skeletal muscle 3.3 Identify and describe different types of muscle contractions: a) isometric b) isotonic, eccentric, concentric c) isokinetic 3.4 Describe and demonstrate the following types of



	<p>movement: resistive, active, active assistive, passive</p> <p>3.5 Describe the length-tension relationship of muscle tissue (active and passive insufficiency)</p> <p>3.6 Identify normal age related changes of the muscular system throughout the lifespan</p>
Course Outcome 4	Learning Objectives for Course Outcome 4
Demonstrate knowledge of normal posture and postural control.	<p>4.1 Describe balance strategies and their impact on postural control</p> <p>4.2 Identify and describe proper body alignment</p> <p>4.3 Identify normal age-related changes related to posture</p> <p>4.4 Describe how to maintain good posture and body alignment</p> <p>4.5 Analyze and conduct postural assessment</p>
Course Outcome 5	Learning Objectives for Course Outcome 5
Demonstrate knowledge of terminology and concepts related to normal gait patterns.	<p>5.1 Identify the normal functional sequence of gait throughout the lifespan</p> <p>5.2 Describe normal gait using correct terminology</p> <p>5.3 Identify factors affecting gait (vertical and horizontal displacement, width of base of support, lateral pelvic tilt, step length, stride length)</p> <p>5.4 Analyze and conduct gait assessment</p>
Course Outcome 6	Learning Objectives for Course Outcome 6
Demonstrate knowledge and analysis of various biomechanical factors/concepts that relate to normal functional movements.	<p>6.1 Identify and describe biomechanical concepts such as:</p> <p>a)linear motion</p> <p>b)kinematics</p> <p>c)angular motion</p> <p>d)biomechanics of muscular strength</p> <p>e)clinical biomechanics</p> <p>f)measure of energy output</p> <p>6.2 Apply biomechanical concepts to activities of daily living, sport, and fitness</p> <p>6.3 Calculate and assess human motion using biomechanical concepts and formulas</p> <p>6.4 Identify appropriate laboratory equipment to evaluate and reinforce biomechanical concepts</p>

Evaluation Process and Grading System:

Evaluation Type	Evaluation Weight
Assignments	30%
Lab Activities	30%
Tests	40%

Date:

December 11, 2023

Addendum:

Please refer to the course outline addendum on the Learning Management System for further information.

