

Montgomery County Community College  
 ESW 224  
 Exercise Physiology with Lab  
 4-3-3

**COURSE DESCRIPTION:**

This ESW major’s course examines the physiological response and adaptations to acute and chronic bouts of exercise, training regimens, and environmental conditions. Through experiential learning, research, and technology, the student will analyze physiological responses to exercise. Training principles, nutritional considerations, and optimal human performance across the lifespan will be identified and analyzed. The lab component of the course will allow students to apply the concepts introduced in the lecture portion in hands-on and computer simulated learning opportunities.

**REQUISITES:**

*Previous Course Requirements*

BIO 129 Functional Human Anatomy and Physiology with a minimum grade of “C”  
**OR** BIO 131 and 132 Human Anatomy and Physiology I and II with a minimum grade of “C”

*Concurrent Course Requirements*

None

LEARNING OUTCOMES Upon successful completion of this course, the student will be able to:	LEARNING ACTIVITIES	EVALUATION METHODS
1. Describe the response and adaptation of the body’s major organ systems to the stress of exercise.	Formal Lecture Projects Formal Oral Presentations Research Paper Written Assignments Class Discussions Group Assignments Videos Internet Web Sites Journal Readings Exams Case Studies Metabolic Cart/Technology Research Labs	Exam Research Project Case Studies Lab Reports

LEARNING OUTCOMES	LEARNING ACTIVITIES	EVALUATION METHODS
2. Explain the metabolic processes responsible for powering human movement.	Formal Lecture Projects Formal Oral Presentations Research Paper Written Assignments Class Discussions Group Assignments Videos Internet Web Sites Journal Readings Exams Case Studies Metabolic Cart/Technology Research Labs	Exam Research Project Case Studies Lab Reports
3. Evaluate how muscles function, allowing for human movement.	Formal Lecture Projects Formal Oral Presentations Research Paper Written Assignments Class Discussions Group Assignments Videos Internet Web Sites Journal Readings Exams Case Studies Technology Research Labs	Exam Research Project Case Studies Lab Reports
4. Explain the central role of the nervous system in the integration of human movement and physical performance.	Formal Lecture Projects Formal Oral Presentations Research Paper Written Assignments Class Discussions Group Assignments Videos Internet Web Sites Journal Readings Exams Case Studies Labs	Exam Research Project Case Studies Lab Reports

LEARNING OUTCOMES	LEARNING ACTIVITIES	EVALUATION METHODS
5. Assess the impact that exercise physiology has on one's progress across the lifespan.	Formal Lecture Projects Formal Oral Presentations Research Paper Written Assignments Class Discussions Group Assignments Videos Internet Web Sites Journal Readings Exams Case Studies Metabolic Cart/Technology Labs Research	Exam Research Project Case Studies Lab Reports
6. Interpret current research data and techniques to develop an understanding of the importance of research in analyzing human movement.	Formal Lecture Projects Formal Oral Presentations Research Paper Written Assignments Class Discussions Group Assignments Videos Internet Web Sites Journal Readings Exams Case Studies Metabolic Cart/Technology Laboratory research Research	Research Project Lab reports
7. Conduct laboratory studies of human performance using the scientific method.	Laboratory research Case Studies Metabolic Analysis/ Technology Lab reports Class Discussions	Lab Reports Research Project

At the conclusion of each semester/session, assessment of the learning outcomes will be completed by course faculty using the listed evaluation method(s). Aggregated results will be submitted to the Associate Vice President of Academic Affairs. The benchmark for each learning outcome is that *70% of students will meet or exceed outcome criteria.*

## SEQUENCE OF TOPICS:

1. Introduction and Overview
2. Bioenergetics
3. Exercise Metabolism
4. Hormonal Responses to Exercise
5. Measurement: Work, Power, Energy Expenditure
6. Muscular Adaptations to Exercise
7. Circulatory Adaptations to Exercise
8. Respiration During Exercise
9. Acid-Base Balance During Exercise
10. Training for Health and Fitness
11. Training for Performance
12. Training for Special Populations
13. Pediatric Exercise Physiology
14. Body Composition
15. Nutrition and Performance
16. Exercise and the Environment
17. Ergogenic Aids
18. Research concepts
19. Technology
20. Use of the Metabolic analysis in measuring physiologic response

## LEARNING MATERIALS:

Katch, V., Katch, F., McArdle, William. (2015). *Essentials of Exercise Physiology* (4<sup>th</sup> ed.). Lippincott Williams and Wilkins.

*Research Quarterly*, AAHPERD (Periodical).

Other learning materials may be required and made available directly to the student and/or via the College's Libraries and/or course management system.

## COURSE APPROVAL:

Prepared by: Ken Black	Date: 2/2000
Revised by: Dr. Anne Livezey	Date: 2/2009
VPAA/Provost Compliance Verification: Dr. John C. Flynn, Jr.	Date: 9/12/2009
Revised by: Dr. Anne Livezey	Date: 6/2012
VPAA/Provost or designee Compliance Verification: Victoria L. Bastecki-Perez, Ed.D.	Date: 6/18/2012
Revised by: Amanda Wooldridge and Dr. Anne Livezey	Date: 7/2014
VPAA/Provost or designee Compliance Verification: Victoria L. Bastecki-Perez, Ed.D.	Date: 12/2014
Revised by: Amanda Wooldridge and Dr. Anne Livezey	Date: 9/29/2017

VPAA/Provost or designee Compliance Verification:  
Victoria L. Bastecki-Perez, Ed.D.

Date: 1/2018

Revised by: Amanda Wooldridge and Dr. Anne Livezey  
VPAA/Provost or designee Compliance Verification:

Date: 2/18/2020

Date: 2/27/2020



*This course is consistent with Montgomery County Community College's mission. It was developed, approved and will be delivered in full compliance with the policies and procedures established by the College.*