

**WAYNE STATE UNIVERSITY
COLLEGE OF EDUCATION**

DIVISION: Kinesiology, Health and Sport Studies
<http://www.kinesiology.wayne.edu>

PROGRAM AREA: Exercise and Sport Science

COURSE: KIN 3570 - Physiology of Exercise I

COURSE REF. NUMBER: 22371 (lecture)
22372, 22373, 22733 (laboratory sections)

COURSE CREDIT: 3 Credits

SEMESTER/YEAR: Winter 2017

COURSE LOCATION/TIME: Lecture: 1107 Old Main Bldg.
Tuesday & Thursday 11:30am - 12:20am

Laboratory: 0006 Old Main Bldg. (& 1225 APHS Bldg.)
Friday 8:30am - 10:10am (# 22372)
Friday 10:30am - 12:10pm (# 22373)
Friday 12:30pm - 2:10pm (# 22733)

INSTRUCTOR: Dr. Hermann-J. Engels

OFFICE ADDRESS: 4512 APHS Bldg.

OFFICE HOURS: Tuesdays & Thursdays: 9:00am - 11:00am
Tuesdays & Thursdays: 3:00pm – 4:00pm
and by individual appointment

OFFICE PHONE: (313) 577-5896

OFFICE E-MAIL: Hermann-J. Engels: Engels@wayne.edu

COURSE DESCRIPTION: Basic physiological concepts as they relate to exercise and human performance. Practical applications incorporated into the laboratory component.

Prerequisite: Introductory Anatomy and Physiology
(BIO 2870 or equivalent)

COURSE OUTCOMES:

At the conclusion of the course the student will have an understanding of the:

1. field of exercise physiology and its place within the broader arenas of kinesiology and sports medicine.
2. cellular bioenergetic sources and pathways available to humans at rest and during various forms of exercise.
3. basic physiological responses during the recovery from exercise.
4. meaning of work, energy, and power and how to evaluate these characteristics in humans.
5. characteristics of the respiratory system and its responses to exercise, including alveolar and pulmonary ventilation.
6. basic components of the gas (O₂, CO₂) transport system.
7. cardiac and vascular responses to exercise, including blood pressure changes and blood flow distribution during exercise.
8. structure and function of skeletal muscle, its relationship to human performance, and the nervous control of muscular activity.
9. general principles of physical training and the major physiological adaptations to training.
10. interaction between exercise, nutrition and weight control.
11. role of exercise and physical activity for fitness and health.
12. basic clinical and laboratory research techniques to evaluate human functional abilities, including cardiovascular and pulmonary characteristics, anaerobic and aerobic power, and body composition.
13. basic process and unique challenges of performing human experimental research in the area of exercise physiology.

REQUIRED TEXT: McArdle, W.D., Katch, F.I., & Katch, V.L. (2015). *Exercise Physiology. Energy, Nutrition, and Human Performance* (8th edition). Baltimore, MD: Lippincott, Williams & Williams (www.lww.com)

CLASS POLICIES:

This course uses a blend of instructional methods consisting of lecture and laboratory-based learning experiences. Students are expected to attend all lectures and laboratories regularly. At the discretion of the instructor, repeated late arrivals or leaving the classroom/laboratory early will result in a lowering of the course grade. All course-related laboratory sessions are conducted in a hands-on type learning atmosphere and require students to actively participate either as an experimental subject and/or a laboratory technician. Truncated PowerPoint presentation slides of lectures given and specific PDF handouts for the various exercise physiology laboratory sessions will be made available online for downloading through the Blackboard course website.

Course Assignments:

It is recommended that students engage in self-directed readings of the appropriate pages in the accompanying course textbook to enhance the understanding of the exercise physiology concepts covered in the course. Students are also asked to purchase a 3-ring binder and to assemble the various PDF handouts made available online throughout the semester into an organized laboratory manual. Students are expected to complete all course work assignments indicated in the laboratory handouts as soon as the topic has been covered in the laboratory part of the class. This includes the necessary calculations, graphing of results, and answering of questions related to a given topic. It is mandatory that the laboratory manual is always kept up-to-date as it may be collected for review purposes anytime during the semester.

Academic Dishonesty, Plagiarism and Cheating:

The College of Education has a “zero tolerance” approach to plagiarism and other forms of academic dishonesty. (See Student Code of Conduct <http://doso.wayne.edu/assets/student-code-of-conduct-brochure.pdf>). Plagiarism includes copying material (any more than 5 consecutive words) from outside texts or presenting outside information as if it were your own by not crediting authors through citations. It can be deliberate or unintended. Specific examples of academic dishonesty, including what constitutes plagiarism, can be found in the University’s Undergraduate Bulletin (<http://bulletins.wayne.edu/ubk-output/index.html>) and Graduate Catalog (<http://www.bulletins.wayne.edu/gbk-output/index.html>) under the heading “Student Ethics.” These university policies are also included as a link on Blackboard within each course in which students are enrolled. It is every student’s responsibility to read these documents to be aware which actions are defined as plagiarism and academic dishonesty. Sanctions could include failure in the course involved, probation and expulsion, so students are advised to think carefully and thoroughly, ask for help from instructors if it is needed, and make smart decisions about their academic work.

Enrollment / Withdrawal Policy:

Students must add classes no later than the end of the first week of classes. This includes online classes. Students may continue to drop classes (with full tuition cancellation) through the first two weeks of the term.

Students who withdraw from a course after the end of the 4th week of class will receive a grade of WP, WF, or WN.

- WP will be awarded if the student is passing the course (based on work due to date) at the time the withdrawal is requested
- WF will be awarded if the student is failing the course (based on work due to date) at the time the withdrawal is requested
- WN will be awarded if no materials have been submitted, and so there is no basis for a grade

Students must submit their withdrawal request on-line through Pipeline /Academia. The faculty member must approve the withdrawal request before it becomes final, and students should continue to attend class until they receive notification via email that the withdrawal has been approved. The last day to withdraw from the course will be at the end of the 10th full week of classes (i.e., Sunday, March 26 2017). Students enrolled in the 10th week and beyond will receive a grade. Because withdrawing from courses may have negative academic and financial consequences, students considering course withdrawal should make sure they fully understand all the consequences before taking this step. More information on this can be found at: http://reg.wayne.edu/Withdrawing_From_a_Course.php

Attention Students with Disabilities:

If you have a documented disability that requires accommodations, you will need to register with Student Disability Services (SDS) for coordination of your academic accommodations. The SDS office is located at 1600 Adamany Undergraduate Library in the Student Academic Success Services department. SDS telephone number is 313-577-1851 or 313-202-4216 (video phone). Once you have your accommodations in place, I will be glad to meet with you privately during my office hours to discuss your special needs. Student Disability Services' mission is to assist the university in creating an accessible community where students with disabilities have an equal opportunity to fully participate in their educational experience at WSU. Please be aware that a delay in getting SDS accommodation letters for the current semester may hinder the availability or facilitation of those accommodations in a timely manner. Therefore, it is in your best interest to get your accommodation letters as early in the semester as possible.

Religious Observance Policy:

Because of the extraordinary variety of religious affiliations represented in the University student body and staff, the Wayne State University calendar makes no provision for religious holidays. It is University policy, however, to respect the faith and religious obligations of the individual. Students who find that their classes or examinations involve conflicts with their religious observances are expected to notify their instructors well in advance so that alternative arrangements as suitable as possible may be worked out.

EVALUATION/
GRADING:

FINAL COURSE GRADES are determined based on a student's demonstrated performance in the following grading areas:

Grading Area	Possible Points	Percent of Total Grade
First Written Examination (sectional)	60	20%
Second Written Examination (sectional)	60	20%
Final Written Examination (cumulative)	90	30%
Active Laboratory Participation and Satisfactory Completion of Laboratory Exercises/Assignments	90	30%
Total	300	100%

Grades will be determined according to the following standard point system:

283 - 300 points = A	219 - 230 points = C
270 - 282 points = A-	210 - 218 points = C-
261 - 269 points = B+	201 - 209 points = D+
249 - 260 points = B	189 - 200 points = D
240 - 248 points = B-	180 - 188 points = D-
231 - 239 points = C+	less than 180 points = F

WINTER 2017

LECTURE SCHEDULE

DATES	TOPIC
01/10-02/02	Introduction to Exercise Physiology Bioenergetics, Anaerobic and Aerobic Energy Pathways Recovery from Exercise Lactate Threshold, Respiratory Exchange Ratio Measurement of Energy, Work, and Power - Applications
Tuesday 2/07	*** FIRST WRITTEN EXAMINATION ***
02/09-03/07	Characteristics of the Respiratory System Alveolar and Pulmonary Ventilation, Gas Exchange and Transport Circulatory System and Exercise Cardiac Output, Blood Flow Distribution Electrocardiography, Blood Pressure Structure and Function of Skeletal Muscle Nervous Control of Muscular Activity
Thursday 3/09	*** SECOND WRITTEN EXAMINATION ***
03/13-03/18	Spring break (no classes)
03/21-04/20	Prediction and Measurement of Human Work Capacity Design of Exercise Programs for Health and Fitness Body Composition Assessment Energy Balance, Weight Control Review for Cumulative Final Examination
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FINAL EXAMINATION – Tuesday, May 2 nd , 10:15am – 12:15pm	

WINTER 2017

LABORATORY SCHEDULE

(Note: Except where indicated, all lab sections will be taught in room 0006 Old Main)

DATE	TOPIC	LAB #
01/13	Introduction to the Exercise Physiology Laboratory	1
01/20	Assessment of Anaerobic Power	2
01/27	Recovery Oxygen Consumption Oxygen Debt, Oxygen Deficit, EPOC	3
02/03	Selected Work Considerations	4
02/10	Examination of Pulmonary Function Characteristics	5
02/17	Resting Heart Rate and Blood Pressure Characteristics	6
02/24	Cardiovascular Adjustments to Acute Submaximal Exercise At Progressive Intensities and in the Recovery from Exercise	7
03/03	Muscular Functioning (specific isometric or isokinetic focus)	8/9
03/10	Open (topic to be determined)	
03/17	Spring Break (No Laboratory Sessions)	
03/24	Estimation of Aerobic Work Capacity Using Clinical Techniques Cycle Ergometry: Submaximal Exercise Heart Rate	10
03/31	Estimation of Aerobic Work Capacity Using Clinical Techniques Questionnaire Data and Post-Exercise Recovery Heart Rate	11
04/07	Skinfold Technique for the Evaluation of Body Composition	12
04/14	Body Composition Assessment using Hydrostatic Weighing	13(in 1225 APHS)
04/21	Integration and Review	14