

Department of Human Performance and Health Education



WESTERN MICHIGAN UNIVERSITY
Human Performance
and Health Education

CRN #: 42311
Course #: HPER 6720
Course Title: Laboratory Techniques
in Exercise Science
Credits: 3
Times: 6 – 8:30PM Tuesday
Location: 1055 SRC (HPRL)

Instructor: Christopher C. Cheatham, Ph.D.
Office: 4021 SRC
Office Hours: 12 – 12:50 PM M,W,F
Or by appointment
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E-Mail: chris.cheatham@wmich.edu
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[Exercise Science / Physiology Programs Website](http://www.wmich.edu/hper-esp)
<http://www.wmich.edu/hper-esp>

Course Description:

This course will provide the students with theoretical knowledge and hands-on experience using laboratory equipment and conducting various assessments of human performance and physiology. For many of the topics covered, we will conduct “mini” research projects which will provide the students with experience in data collection, the analysis of data, and the interpretation of data.

Course Objectives:

Upon completion of this course, students will:

- Gain theoretical knowledge on a variety of assessments of physiological function and human performance
- Gain hands-on experience utilizing laboratory equipment and resources
- Gain a basic understanding of principles of phlebotomy
- Gain experience in the scientific style of writing.
- Gain experience in conducting independent research using different methodologies typically utilized in exercise science
- Gain experience in data collection, analysis, and the write-up of results.

Required Text:

Cheatham, C.C. Laboratory Techniques in Exercise Science Course Pack. CoursePack ID# TBD. Available at the WMU Bookstore. Price: \$TBD

Note: If the WMU Bookstore runs out of copies (which they might), please inform one of the bookstore staff. A copy will typically be available for you the next day. If it is not available within 24 hours, please let me know.

Grading:

Laboratory Write-ups:	80%	100 – 92%	A	77 – 70%	C
Attendance:	20%	91 – 87%	BA	69 – 65%	DC
		86 – 83%	B	64 – 60%	D
		82 – 78%	CB	59 – 0%	E

Course Content:

The following topics will be covered in this course:

Topic 1 – Maximal Oxygen Consumption (VO_{2max}) Testing

Laboratory Manual Section 02

Laboratory Exercise: Assessment of VO_{2peak} using a treadmill and cycle ergometer

Topic 2 – Determination of the Lactate and Ventilatory Thresholds

Laboratory Manual Section 03

Laboratory Exercise: Demonstration of a lactate threshold test

Topic 3 – Body Composition

Laboratory Manual Section 04

Laboratory Exercise: Determination of body composition using hydrostatic weighing, skinfold thickness, bioelectrical impedance analysis, and circumferences

Topic 4 – Electromyography (EMG)

Laboratory Manual Section 05

Laboratory Exercise: Various surface EMG demonstrations and analyses of data.

Topic 5 – Muscle Function Testing

Laboratory Manual Section 06

Laboratory Exercise: Force production during isometric and isokinetic knee extensions, isokinetic fatigue test.

Topic 6 – Wingate Anaerobic Test

Laboratory Manual Section 07

Laboratory Exercise: Performing the Wingate Power Test, gender differences in power production.

Topic 7 – Pulmonary Function Testing

Laboratory Manual Section 08

Laboratory Exercise: FVC and MVV Tests, Simulation of COPD and Restrictive Lung Disease

Topic 8 –Phlebotomy

Laboratory Manual Section 09

Laboratory Exercise: Phlebotomy demonstration, biochemistry assays

Topic 9 – Measurements in Environmental Physiology

Supplemental Readings

Laboratory Exercise: Measurements of temperature, sweat rate, and skin blood flow

Miscellaneous:

- Students should come prepared each week to exercise. This typically means short-sleeve shirt, shorts, and athletic shoes.
- If a student has a medical reason not to perform any of the laboratory exercises, it is the student's responsibility to notify the instructor.
- All written work must be typed. Assignments will be assessed a 10% penalty/day late.
- Students are encouraged to work together. However, assignments should be **independently prepared**.
- For many of the topics, we will need to compile the class data before we can perform the required statistical analyses. To aid in this process, we will be using Google Documents available on a Google website that I have developed for this course. For these topics, I will create a "template" spreadsheet for the compiling of data. Students will be able to login to this website, open the spreadsheet, and enter their data into the spreadsheet. Once all of the data is entered, I will make an SPSS document available for the data analysis.
 - To gain access to the spreadsheet, follow these steps:
 - Go to <http://documents.google.com>
 - Login using the following information:
 - E-mail: **wmu.hper6720@gmail.com**
 - Password: **wmu-hper6720**
 - On the left, click on the folder for the given topic and then click on the appropriate spreadsheet.
 - As you enter your information, the document will automatically save.

Things to Remember:

- This outline/Syllabus is subject to change.
- **Cell phones, computers must be silenced and PUT AWAY during class time. No texting, etc. The only exception is if you use your computer to take notes.**
- All written work must be typed.
- Students should bring a calculator to class every day.
- You are responsible for making yourself aware of and understanding the policies and procedures in the Undergraduate and Graduate Catalogs that pertain to Academic Honesty. These policies include cheating, fabrication, falsification and forgery, multiple submission, plagiarism, complicity and computer misuse. [The policies can be found at <http://catalog.wmich.edu> under Academic Policies, Student Rights and Responsibilities.] If there is reason to believe you have been involved in academic dishonesty, you will be referred to the Office of Student Conduct. You will be given the opportunity to review the charge(s). If you believe you are not responsible, you will have the opportunity for a hearing. You should consult with your instructor if you are uncertain about an issue of academic honesty prior to the submission of an assignment or test.
- Students are directed to <http://osc.wmich.edu> and www.wmich.edu/registrar to access the Code of Honor and general academic policies on such issues as diversity, religious observance, student disabilities, etc.
- Reasonable accommodations will be made for students with disabilities.
- Any assignment turned in after the due date will receive a 10% deduction per day late. Failure to turn in an assignment will result in a score of 0% for that assignment.