

George Mason University
College of Education and Human Development
PhD in Education – Exercise, Fitness and Health Promotion Specialization
EFHP 825.001 – Data Analytics in Exercise, Fitness, and Health Promotion
3 Credits, Spring 2020

Friday: 10:30AM – 1:10PM | Katherine Johnson Hall Room 252 | Science & Technology Campus

Faculty

Name: Dr. Joel Martin / Dr. Nelson Cortes

Office hours: By Appointment

Office location: KJ Hall 201E / 201E

Office phone: 703-993-7607 / 703-993-9257

Email address: jmarti38@gmu.edu / ncortes@gmu.edu

Prerequisites/Corequisites

Graduate Standing or Permission of Instructor

University Catalog Course Description

Examines data processing, analysis and interpretation using software applications common in Exercise, Fitness and Health Promotion.

Course Overview

Not Applicable

Course Delivery Method

This course is delivered using classroom instruction (face-to-face) and laboratory experiences.

Learner Outcomes or Objectives

This course is designed to enable students to do the following:

1. Critique the appropriate analytic methodology to process data in Exercise, Fitness and Health Promotion.
2. Select and design data processing procedures to analyze data from measurement techniques and instrumentation.
3. Synthesize literature in data analytics in Exercise, Fitness and Health Promotion.
4. Interpret data processing results from various equipment commonly used.

Optional Texts

Payton C, Bartlett R. *Biomechanical evaluation of movement in sport and exercise: the British Association of Sport and Exercise Sciences guide*. Routledge; 2007.

Other important resources:

During this course, we will primarily use MATLAB software. You can have access to this software using Virtual Computing Lab (VCL), <https://doit.gmu.edu/faculty-and-staff/computer-labs/virtual-computing-lab/>. You can also access it remotely. For that you just need to be connected to the Virtual Private Network (VPN), https://itservices.gmu.edu/services/view-service.cfm?customel_dataPageID_4609=6169, and then connect to VCL. The classroom for this class is a computer lab, and every computer has MATLAB.

You may also download a student version from the MATLAB website:

<https://www.mathworks.com/products/matlab/student.html>

Tutorials are available here:

https://www.mathworks.com/learn/tutorials/matlab-onramp.html?s_cid=learn_ONRAMP_BAN

<https://www.tutorialspoint.com/matlab/index.htm>

Course Performance Evaluation

Students are expected to submit all assignments on time in the manner outlined by the instructor (e.g., Blackboard, Tk20, hard copy).

Assignments and Examinations

- **Data Analysis Assignments & Portfolio** – The intent of the portfolio is to apply the theory learned in EFHP 815 class as well as this class to a variety of data analysis applications. During the class meetings, students will conduct data analyses and interpretation of data collected previously. Assignments can be finished off class, and turned in at the beginning of next class. The portfolio will be submitted at the end of the semester and include all materials developed during the semester. Detailed instructions will be provided to students at the start of the semester. A total of 7 assignments and one portfolio will be required.
- **Final Project & Presentation** – Each student will be required to complete a final project data analyses where the student will write a matlab script, to call/import/read data, visually inspect data, process data, compute descriptive & inferential analysis and plot graph(s). The student will have to write a brief report on the process and respective data interpretation, as well as submit the respective matlab script with the report. American Medical Association Manual (AMA) of Style (10th edition) format must be used for all written work in this class (e.g., citations, references, creation of tables, and formatting headers for paper sections). Topics will be initially discussed during the first week of class. *Students must notify both instructors by email no later than 5 pm on February 14 of their final project topic and scope of data analysis.*

Course Performance Evaluation Weighting

This course will be graded on a point system, with a total of 100 possible points.

ASSESSMENT METHOD	POINTS
Assignment #1	10
Assignment #2	10
Assignment #3	10
Assignment #4	10
Assignment #5	10
Assignment #6	10
Assignment #7	10
Portfolio	10
Final Project Presentation	10
Final Project	10
TOTAL	100

Grading Policies

The student's final letter grade will be earned based on the following scale:

Grade	Percentage
A	94 – 100%
A-	90 – 93%
B+	88 – 89%
B	84 – 87%
B-	80 – 83%
C	70 – 79%
F	0 – 69%

Note: Although a B- is a satisfactory grade for a course, students must maintain a 3.00 average in their degree program.

Professional Dispositions

See <https://cehd.gmu.edu/students/policies-procedures/>

Class Schedule

Week	Topic	Assignment Due Date
1 – 1/24	Introduction to course ICC based on demographics and anthropometrics data. ICCs, types of ICCs and why it is important to establish rater or testing reliability	
2 – 1/31	Introduction to Matlab 1 – The Basics	
3 – 2/7	VO2 analysis (Dr. Robison) Introduction to Matlab 2 – Applications to Human Movement Data Assignment #1	
4 – 2/14	Basics of Smoothing and Filtering Data Introduction to Matlab 3 – Function and Algorithm Development Assignment #2	Assignment #1 Due Final Project Proposal Email due to instructors by 5 pm
5 – 2/21	Processing EMG Assignment #3	Assignment #2 Due
6 – 2/28	Kinematics: Residual Analysis – Determine optimum filtering Assignment #4	Assignment #3 Due
7 – 3/6	Kinetics: Processing & Filtering Force Plate Data Determining ‘events’ from the data Assignment #5	Assignment #4 Due
8 – 3/13	<i>Spring Break</i>	
9 – 3/20	Balance & Stability: Center of Pressure Data Analysis Assignment #6	Assignment #5 Due
10 – 3/27	TBD	

11 – 4/3	Data Mining & Machine Learning: WEKA Tutorial	Assignment #6 Due
	Assignment #7	
12 – 4/10	EFHP 811 Data Collection – No EFHP 825 Class	Assignment #7 Due
13 – 4/17	Final Project Workday	
14 – 4/24	Final Project Workday	Portfolio Due by Midnight
15 – 5/1	Final Project Presentations	Presentation Slides Due by 9 am
		Final Project Due by Midnight on May 10

Core Values Commitment

The College of Education and Human Development is committed to collaboration, ethical leadership, innovation, research-based practice, and social justice. Students are expected to adhere to these principles: <http://cehd.gmu.edu/values/>.

GMU Policies and Resources for Students

Policies

- Students must adhere to the guidelines of the Mason Honor Code (see <https://catalog.gmu.edu/policies/honor-code-system/>).
- Students must follow the university policy for Responsible Use of Computing (see <https://universitypolicy.gmu.edu/policies/responsible-use-of-computing/>).
- Students are responsible for the content of university communications sent to their Mason email account and are required to activate their account and check it regularly. All communication from the university, college, school, and program will be sent to students **solely** through their Mason email account.
- Students with disabilities who seek accommodations in a course must be registered with George Mason University Disability Services. Approved accommodations will begin at the time the written letter from Disability Services is received by the instructor (see <https://ds.gmu.edu/>).
- Students must silence all sound emitting devices during class unless otherwise authorized by the instructor.

Campus Resources

- Support for submission of assignments to Tk20 should be directed to tk20help@gmu.edu or <https://cehd.gmu.edu/aero/tk20>. Questions or concerns regarding use of Blackboard should be directed to <https://its.gmu.edu/knowledge-base/blackboard-instructional-technology-support-for-students/>.
- For information on student support resources on campus, see <https://ctfe.gmu.edu/teaching/student-support-resources-on-campus>

Notice of mandatory reporting of sexual assault, interpersonal violence, and stalking:

As a faculty member, I am designated as a “Responsible Employee,” and must report all disclosures of sexual assault, interpersonal violence, and stalking to Mason’s Title IX Coordinator per University Policy 1202. If you wish to speak with someone confidentially, please contact one of Mason’s confidential resources, such as Student Support and Advocacy Center (SSAC) at 703-380-1434 or

Counseling and Psychological Services (CAPS) at 703-993-2380. You may also seek assistance from Mason's Title IX Coordinator by calling 703-993-8730, or emailing titleix@gmu.edu.

For additional information on the College of Education and Human Development, please visit our website <https://cehd.gmu.edu/students/> .