



**Measurements and Techniques in Exercise Science
(KIN 5371)**

Department of Kinesiology, College of Health Sciences,
The University of Texas at El Paso

Spring 2020



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GRADUATE STUDENT: Michael Sanchez; HSSN 448; mjsanchez6@miners.utep.edu
CLASS TIME: Monday 3:30 PM – 6:20 PM (136 HSSN)
OFFICE HOURS: Wednesday 12:00 PM – 1:00 PM (445 HSSN)
(by appointment)

COURSE DESCRIPTION: In this course students will learn to use equipment relevant to measurement and understanding of exercise physiology. Alongside learning laboratory techniques to collect data, students will also learn how to develop research proposals, analyze and interpret scientific data relevant to the area of exercise physiology.

COURSE OBJECTIVE:

1. Learn various research methods relevant to measurements of metabolic health and physiological response to exercise.
2. Learn and demonstrate scientific data collection and data analyses
3. Learn and demonstrate scientific literature review, developing research questions, answering those questions by analyzing collected data and meaningful data interpretations

COURSE TEXT

ACSM’s Guideline for Exercise Testing & Prescription, 10th ed.; Handouts, journal articles

EVALUATION OF STUDENTS

Quizzes	15%
Data Collection and participation	10%
Research Project	70%
Module 1 (15%)	
Module 2 (25%)	
Module 3 (30%)	
Research abstract	5%

GRADING SCALE*

A = 90-100%
B = 80-90%
C = 70-80%
D = 60-70%
F = below 60%

* Total points possible in quizzes are subject to change.

**All students are expected to participate in classroom as well as be proactive and cooperate in laboratory testing.

REQUIREMENT:

- You are required to work with class members for data collection.
- You are required to come and participate in data collection outside of scheduled class time (some measurements require you to fast).
- You must be present to take the quizzes during class – no exceptions.
- Data submission/report MUST be turned in to receive a final grade.
- Cell Phones should be OFF and should not be seen in the class and during data collection in laboratory (contact me in advance if you must take a call in case of an emergency)

KIN 5371 - TENTATIVE SCHEDULE (*subject to change*)

Date	Important Dates/Deadlines
Tentative Dates (Subject to change)	Research Project, Module I – February 17/24, 2020
	Research Project, Module II – March 16/23, 2020
	Research Project, Module III – April 27, 2020
	Research Project, abstract – May 4, 2020
03/16-20	<i>Spring Break</i>
03/27	<i>Course Drop Deadline</i>
Tentative Schedule	
Week 1 – 8	<ul style="list-style-type: none"> ➤ Introduction ➤ Goals and objectives ➤ Requirements ➤ Introduction, goals, and objectives; course requirements ➤ Methods and data collection <ul style="list-style-type: none"> ○ Body Composition (Skin folds, Bioelectrical Impedance, Underwater Weighing, BOD POD, DEXA) ○ Maximal Oxygen Consumptions (VO₂max) ○ Maximal Anaerobic Capacity/Running Economy (Wingate, Margaria Stair Run, 40yd dash) ○ Insulin Sensitivity: Fasting Glucose, Glucose Tolerance Test, Hyperinsulinemic-Euglycemic Clamp ○ Physical activity level - accelerometer ○ Calorie intake, calorie expenditure ○ Metabolic Gas Volumes – Resting Metabolic Rate ○ data analyses ➤ Research Project <ul style="list-style-type: none"> ○ Developing research questions <i>Recommended: Briefly present your weekly progress in research question development in each class if you wish to receive feedback)</i> ○ Literature review ○ Data analyses ○ Data interpretation ➤ Peer Feedback
Week 9 – 15	<ul style="list-style-type: none"> ➤ Methods <ul style="list-style-type: none"> ○ Western Blotting ○ Cell Culture ○ Immunohistochemistry ➤ Research Project <ul style="list-style-type: none"> ○ Literature review ○ Developing research questions ○ Data analyses ○ Data interpretation ➤ Research Abstract ➤ Peer Feedback

ADDITIONAL COURSE INFORMATION

This course focuses on methods, techniques, and procedures for health evaluation and the instrumentation used in these tests. The level of presentation of this course necessitates a current understanding of the physiological concepts presented in other courses. You are **expected** to have a basic understanding of exercise physiology and to have reviewed outside material before lecture to enhance your comprehension of these concepts.

The laboratory assignments of this course are an integral part of your understanding and participation is expected. All of the experiments require close contact with other students, computation of values, development of tables and figures for the effective presentation of data, and critical thinking to interpret the data. It is important that you plan ahead and work efficiently. *Procrastination will be your undoing.*

RUBRICS AND GRADING CRITERIA

Quizzes (15% of grade):

You will be tested on the materials presented in the class. Each student **MUST** complete quizzes and exams during the designated class period. Students will not be allowed to make-up a missed quiz or exam without **prior** arrangement made in case of emergency. Quizzes will be given unannounced throughout the semester. If you come late/leave early – you will not be allowed to make up for the quiz.

Data Collection and participation (10% of grade): Each student is responsible for collecting data throughout the semester with full integrity and update the data on the document that will be shared with all the students. ***Data should be updated on the datasheet within 2 days*** after the data collection. In the interest of fairness to all students, lack of integrity in data collection, absence, mistakes in calculation, lack of organization in updating data sheet, inability to update the data sheet within 2 days of data collection etc. will lead to a ***penalty of 2% of the grade or the equivalent of a letter grade for every day late.***

Research Project (70% of grade):

After determining the primary research focus (*example: insulin sensitivity, maximal aerobic capacity, physical activity level, body composition etc.*), each group will work together to review relevant literature, develop research question(s), analyze data and present the study outcomes. This will be completed in three modules.

Students must upload the presentation and relevant articles using the link on blackboard. PowerPoint Presentations are due before class time.

Relevant articles are due midnight before the scheduled presentation.

Please name the pdf copy of the articles in following format:

Author last name_year of publication_title of the article

(you may need to abbreviate the article title as blackboard may not allow long file name)

*****Some of the basic segments below do not have specific points assigned. However, inability to include those section will result in losing overall points.***

Presentation Module 1 (15% of grade):

1. Primary research questions you intend to answer (1 slide) (1%)

2. Introduction, relevant terminology, definitions etc. related to your research topic (5%)
3. Literature Review: Present at least 6 original research articles directly aligned to your research questions in following format. (6%)
 - a. Title, author information, purpose of the study (1 slide)
 - b. Methods used (1 slide)
 - c. Clearly present the relevant data from the article (figures and tables must be interpreted accurately)
 - d. Conclusion of the study
4. Overall summary/conclusion(s) from the articles you have presented (1 slide) (2%)
5. Revised research question(s) based on the literature review (if any)
6. Clear plan for module 2 (example: based on the literature you presented how will you revise your research question (if you decide to revise)? What literature will you search to answer those questions? etc.) (1%)
7. Feedback and Discussion – This may lead to additional research questions/literature review

Presentation Module 2 (25% of grade):

1. Revised research questions developed from Module 1 (1 slide)
2. Summarize relevant literature that were presented in module 1 (1 slide)
3. Discuss additional literature (at least 6 original research articles) to solidify the research questions (figures and tables directly relevant to research questions). Your literature review, at this point, should clearly indicate your in-depth understanding in the topic you have chosen and the gap in literature that you are planning to answer in module 3. (10%)
4. Any final modification to the research questions based on literature review in module 2.
5. Methods: You are expected to demonstrate *in-depth* understanding on the research methods you have chosen for your project and demonstrate your in-depth understanding about the principle(s) of each method(s), detailed protocol of the methods, strength and limitations of the methods, and critical thinking related to method(s) and technique(s) used in your articles of interest. (10%)
6. Data analyses plan – How the data will be analyzed to answer the specific questions (specifics on statistics, data presentations etc.) (3%)
7. Expected outcome results based on the literature review (hypotheses) (2%)

Presentation Module 3 (30% of grade):

1. Background Literature (*briefly summarize* your findings from previous presentations and include any additional data that may be relevant to complete your literature review) (3%)
2. Research Questions (1 slide)
3. Methods
 - a. summarize methods
 - b. Data analyses/statistics
4. Results – Present the relevant data in a format that is appropriate for a *peer reviewed research article* (tables and figures). (15%)
 - a. Study design and specific statistics used for analyzing data
 - b. Descriptive statistics in a table
 - c. Relevant Figures directly aligned to answering research questions asked

5. Discussions – discuss the findings and evaluate how these results relate to the objectives as well as present body of scientific literature. You will be evaluated for your critical thinking in interpretation of data. You should discuss possible sources of error, and conclusions derived from the data. (10%)
6. Summary/Conclusion (2%)

Research Abstract (5% of grade):

Based on the research project outcome results, students will write an abstract following ACSM National abstract writing guidelines (200 characters not including spaces). Look up guidelines for abstract submission on <https://www.acsm.org>

CHEATING, PLAGIARISM, SCHOLASTIC DISHONESTY, AND STUDENT DISCIPLINE:

Cheating is unethical and not acceptable. Plagiarism is using information or original wording in your paper without giving credit to the source of that information: it is also not acceptable. *Do not submit work under your name that you did not do yourself, ever.* You may not submit work for this class that you did for another class. If you cheated or plagiarized, you will be subject to disciplinary action.

"Scholastic dishonesty, which includes the attempt of any student to present the work of another as his or her own, or any work which s(he) has not honestly performed, or attempting to pass any examination by improper means is a serious offense and will subject the student to disciplinary action. The aiding and abetting of a student in any dishonesty is held to be an equally serious offense. All alleged acts of scholastic dishonesty will be reported to the Dean of Students for disposition. It is the Dean of Students' responsibility to investigate each allegation, dismiss the allegation, or proceed with disciplinary action in a manner, which provides the accused student his or her rights of due process."

PROFESSIONAL CONDUCT

During this course you will be expected to deal with your subject area, your colleagues, and yourself as a professional. You are expected to approach learning with offensive strategies rather than with defense and evasion. Demonstrate pride in your chosen profession through both your actions and your attitude. This includes being on time for class, be respectful during the class and coming to class prepared. **Attendance is expected. Contact the instructor if you are going to miss a class.**

Students in Need of Assistance: UTEP seeks to provide reasonable accommodations for all qualified individuals who need accommodations or support for their learning. This university adheres to all applicable federal, state, and local laws, regulations and guidelines with respect to providing reasonable accommodations as required, affording equal educational opportunity. It is the *student's responsibility* to register with the **Center for Accommodations and Support Services** <http://sa.utep.edu/cass/> in the UTEP Union Bldg. East Wing, Room 106 **within the first two weeks of classes**, and inform the faculty member to arrange for appropriate accommodations or support.