

EXERCISE PHYSIOLOGY 3010

Dramitus Personae

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5:30 to 6:15pm Office Hours or by appointment

Discipulae et

Discipuli: Those that have completed a Human Physiology course. **Retain this syllabus for graduate program applications.**

Textbook: McArdle, Katch, & Katch

Readings: Required: **1.** Oakland University, Academic conduct policy, in *Oakland University Undergraduate Catalog* (Under: “Academic Policies and Procedures” => “Other Academic Policies” => “Academic conduct policy”); **2.** Choose any one reading from the *Great Books of The Western World* (AC1.G3 V.1 to AC1.G72 V.42) or the *Harvard Classics* (AC 12.A4 V.1 to V.50). **3.** Introduction to textbook. First reading submit online (Reading 1) first then the others are to be submitted online (Reading 2&3) as a single document on. Turn in typed one to two pages per reading with your name, date reading was completed, title & author of reading, and statements of the most salient points. Spelling, grammar, etc. all count toward grade. Must be Times New Roman 12 pt font, 1 ½ spaced lines with 1 inch margins all around page.

Grades: 92% = 4.0, 84% = 3.6, 76% = 3.0, 71% = 2.5, 66% = 2.0

%Grade = Average % of Weekly Quizzes * 0.75 + % Project Grade * 0.15 + %Project in class assignment & Final Essay * 0.08 + % Reading Grade * 0.02

Instructor discretion ± 5% pts.

You have only one shot at each quiz. Make-ups are possible for quizzes—make a 20-30 minute appointment to see me and you will undergo oral questioning of the subject matter for that quiz and you will give oral answers though any calculations you will be allowed to use paper, pencil, and calculator.

Project: You have four choices: 1) group oral presentation, 2) individual poster presentation, 3) **assist** in a research study (**approved by instructor**) with a summary of four research papers related to the research study + complete CITI training, 4) be a **participant** in a research study (**approved by instructor**) with a summary of three research papers related in some way to the research study.

1. **Group Oral:** Three to four individuals per group decide on a common hypothesis (must be something relating exercise and physiology). The hypothesis is supported or refuted by **comparing** and **contrasting** at least **twelve** Original **EXPERIMENTAL** research articles from **peer-review** journals (*exempli gratia*, *Medicine and Science in Sports and Exercise*, *Journal of Applied Physiology*). The group will present its findings to the class at the end of the semester. At that time the group will submit a packet to me online (Project Part D). Each **person** will maintain a log of their work, your group members will initial your log.
2. **Individual Poster:** you’ll decide on a hypothesis (must be something relating exercise and physiology). The hypothesis is supported or refuted by **comparing** and **contrasting** at least six Original **EXPERIMENTAL** research articles from **peer-review** journals (*exempli gratia*, *Medicine and Science in Sports and Exercise*, *Journal of Applied Physiology*). You will present your findings in a poster session at the end of the semester. At that time you will submit to me a packet online (Project Part D).

Group or individual hypothesis to be set & turned in online (Project Part A) as a **Typed** statement with your name or names of group members and the hypothesis. **Typed** hypothesis statement & draft of data table to be turned in online (Project Part B). First draft of abstract, reference list, and power point turned in online (Project Part C). The corrections (*corrigenda*) are expected by the presentation.

3. If you **assist** with data collection or establishing procedures in an exercise related research study you will keep a log of your assistance (must be signed by the investigator when completed) and write a one-two page summary for each of four published original **EXPERIMENTAL** research papers (*exempli gratia*, *Medicine and Science in Sports and Exercise*, *Journal of Applied Physiology*) Summary must follow research paper format & be fully referenced (see above journals for reference format) and in Times New Roman 12 pt font, 1 ½ spaced lines with 1 inch margins all around page). In addition, you must complete & pass the CITI training & submit that result. Online submit (Project Part A) the name of the investigator and what you might be doing. Online submit (Project Part B) your reference list. Online submit (Project Part C) as one document drafts of the summary papers (including reference list). Online submit (Project Part D) the final drafts of summary papers, reference list, the CITI training test result, and your log signed by the investigator as one document.
4. If you **participate** in an exercise related research study you must turn in to me a statement that you have completed your participation in the study and have it signed by the investigator and write a one-two page summary for each of three published original **EXPERIMENTAL** research papers (*exempli gratia*, *Medicine and Science in Sports and Exercise*, *Journal of Applied Physiology*). Summary must follow research paper format & be fully referenced (see above journals for reference format) and in Times New Roman 12 pt font, 1 ½ spaced lines with 1 inch margins all around page). If you do drop out as a participant in a research study before completing everything, then you must complete one of the other project choices. Submit online (Project Part D) the signed completion statement and summary of research papers. Online submit (Project Part A) the name of the investigator and what you might be doing. Online submit (Project Part B) the reference list. Online submit (Project Part C) as one document drafts of the summary papers & reference list. Online submit (Project Part D) the final drafts of summary papers, reference list, and the signed statement from the investigator that you completed the project.

Group/Individual Project

- 1) Oral or Poster **Power Point** Presentation: The percentages below indicate importance/weighting of effort.

Title & Author(s) slide and Introduction slide (10%)

Explain the background & significance of your project, state your **definitions**, & *most importantly* state your **HYPOTHESIS/QUESTION**.

Methods slide (15%)

Describe the Indexes, key words, etc. that you used to find your articles. State your Criteria for selection of the articles to be used and rejected.

Results slides (60%)

Analyze your results: How many articles reviewed,? How many articles supported your thesis & Quantitatively what did they find?
How many articles refuted your thesis & Quantitatively what did they find?
How many articles were inconclusive ?
Display results in a graph. (see example)

(Oral presentation) Describe one experiment for an example.

Conclusion/Recommendation slide (10%)

Argue for acceptance, rejection or suspending judgment on your hypothesis: what can you conclude about what the experiments say in regards to your thesis ? Based upon the findings are there any **recommendations**?

2) Individual Poster or Group Oral Packet: submit online as one document (due at the time of your presentation)

Abstract (Not more than one page)

Title, Author(s), Institution

Hypothesis, Methods, Results, Conclusion

Data Table

Reference list: Use the same format as *Medicine and Science in Sports and Exercise*.

A copy of each slide with the name of the student who prepared it.

Copy of Your log

For the group oral - Grades for your co-workers: see below

For the group oral presentation (10% of project grade):

Each individual will submit online that contains a grade for each member of their group. Failure to turn in your grading & in the proper format can result in the loss of these points for your grade. The grade should be *from 0 to 10 points* and must follow the following format:

Guideline for grading

0 – 1.5 Setting hypothesis/question & data table structure development

0 – 4.0 Finding research articles & contribution to data table formation

0 – 1.0 Preparation of Abstract

0 – 3.5 Preparation of Presentation

_____ **Total Points**

Optional Comments

Materiae — arrectis auribus

Salvete—

Below are the primary objectives but you should also note objectives listed in the textbook. The underlined words, with all but the first, refer to source material in the textbook. If you miss a lecture you are expected to find out from your classmates what lecture material was covered and any announcements made.

Research

From their titles & brief description, **select** the Experimental, Review/meta-analysis, Clinical, and Case Study research articles. **Define** Theoretical, Empirical, Basic, and Applied research. From their titles & brief description, **select** which articles are primary sources and which are secondary. **Define** statistically significant, mean differences, $p < .05$, and control group. **Identify** the type of research articles that can be used for your project. **List & Define** the major areas of scientific misconduct. **State** the important points of scientific conduct regarding research using humans subjects as indicated in the Nuremberg Code. Lecture.

Alimentum:

List & define the energy nutrients. **Describe** the relationship between dietary nutrient content and exercise performance. **Describe** the relationship between nutrient use as an energy source and intensity of exercise or duration of exercise. **Describe** a method for measuring nutrient uptake/output of an exercising muscle. Section 1 & Chapter 4

Vis:

Explain the different energy systems and identify the associated energy nutrient(s). **Compare** and **contrast** the different energy systems and their relationship to exercise. **Explain** the significance of RQ and **contrast** and **compare** it to RER. **Describe** the relationships among age, sex and BMR. **Evaluate** if a BMR result is normal. **Describe** the factors that affect the thermic effect of food. **Describe** the factors that affect the metabolic rate during exercise. **Describe** the relationship between VO₂ and time during submaximum exercise. **Describe** two methods of measuring energy expenditure. **Use** VO₂ and VCO₂ to calculate energy expenditure. Section 2

Anima:

Describe the relationship between thoracic muscle recruitment and intensity of exercise. **Describe** the relationship between minute ventilation and exercise intensity--**identify** the ventilation threshold. **Describe** the relationships among minute ventilation, breathing frequency, and tidal volume during exercise. **Explain** how Fb and TV affect alveolar ventilation. **Describe** three functional pulmonary measures and use them to **evaluate** exercise ventilation. **Describe** the relationship between exercise and the Vd/TV ratio. Chapter 12 & 14 (part 2)

Sanguis:

Describe the factors that affect gas diffusion. **Describe** the relationship between exercise and the diffusion capacity. **Use** the pH, PO₂, Hb, and the oxygen pressure-saturation curve to calculate the oxygen content of blood. **Explain** how acute and chronic exercise affects the oxygen pressure-saturation relationship and indicate the significance of this. **Describe** how CO₂ is transported in the blood and its relationship to pH & Hb-O₂ Saturation changes during exercise. **Describe** the changes in plasma volume with acute and chronic exercise. Chapter 13 & 14(part3)

Cor:

Define cardiac output and **describe** the relationship between it and exercise intensity. **Describe** the relationship between the factors of cardiac output (in regards to the heart) and acute and chronic exercise. **Describe** the relationship between the factors of cardiac output (in regards to the vascular system) and acute and chronic exercise. **Describe** one method for measuring cardiac output and its factors. **Use** cardiac output or factors of cardiac output or both to calculate other factors of cardiac output. Chapter 15 & 17

Musculus:

List the different kinds of muscle and **compare & contrast** them. **Describe** the skeletal muscle fiber types. **Describe** the relationship between exercise intensity and motor unit recruitment. **Describe** the length-tension relationship and **apply** it to the heart and **define** contractility. **Describe** the muscle fiber changes with acute and chronic exercise. **Describe** the different modes of muscle contraction, **contrast** them, and **describe** how to measure the different modes. Chapter 18 & 19

Imperium:

Explain how the endocrine and nervous systems regulate the body's systems to bring about the physiological changes described in the preceding weeks. **Compare** and **contrast** the exercise response of smooth muscles located in different tissues. Chapter 14(part1), 16, 19, & 20

Amplificatio:

Describe the components of overload and **apply** them to aerobic and resistance training. Section 4

Corpus:

Describe three methods of body composition analysis. **Describe** the relationship between nutrient intake, exercise, and body composition changes. **Define** the different terms for the two compartment model of body composition. **Use** an individual's body composition results to specify a recommended body mass. Describe the limitations of the different methods of measuring/estimating body composition. Section 6

Other topics for lecture depend on topics chosen for projects.

Offero: Exercise Physiology Conference: groups & individuals present their project to the class-Project Questions given during presentations, to be answered and handed in at the end of the presentations.

Final Essay: Speculate or **argue** for a relationship between the three readings. Spelling, grammar, organization, and neatness are most important. Make specific references to content of readings to demonstrate that you actually read the material. Equivalent to 1 ½ to 2 pages typed, 1 ½ line spacing, Times New Roman 12 pt font, and 1 inch margins all around page. Submit online (Essay), Due at the end of the semester.

Acta est fabula, Valete!

EAMPLE OF LOG

EXS 3010 Project Log for the Research Assistance or the Group Oral Presentation

Name:

Date	Duration	Describe specifically what you did.
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Initials of co-workers for group project or investigator signature for assisting with a research study: _____

EXAMPLE OF COMPLETION STATEMENT

EXS 3010 Research participant completion of study statement.

I, _____, have complete my portion as a participant in a study during the _____
semester.

PI signature: _____