GEORGE MASON UNIVERSITY
School of Recreation, Health and Tourism
PHED 450-001 – Physiology of Exercise (4)
Lecture: Tues & Thurs 9:00 – 10:15 AM
Lab: Tues 10:30 – 11:45 AM
Fall 2010

Professor: Dr. Nelson Cortes
Teaching Assistant: TBD
Office: Room 210 Bull Run Hall (Prince William Campus)
Office Hours: Tuesday: 12PM – 1PM; Thurs: 10:30AM – 11:30AM
Email: ncortes@gmu.edu
Office Phone: (703) 993 – 9257 – If you cannot reach me there, send an e-mail directly to my Mason account (not via Blackboard) and I will get back to you ASAP.

Class Location:
Lecture: Room 256 Bull Run Hall
Lab: Room 257 Bull Run Hall or in the Freedom center as needed.

Prerequisites:
BIOL 124, 125, or BIOL 103, 228; and PHED 300

Course Description:
Lecture: This portion of the course is a demanding study in the theory of exercise physiology. Its purpose is to introduce students to the physiologic, neuroendocrine, and biochemical changes of the human body that are associated with either a single bout of exercise or chronic work.
Lab: The laboratory portion of this course will be treated as a seminar on current topics in the field of exercise science. Weekly evidence-based presentations will take place, and article reviews will be assigned to reinforce concepts discussed in the seminar sessions. Material presented during seminar is fair game for the final exam.

Objectives:
Upon successful completion of this course, students will be able to:
1. Obtain a workable theoretical knowledge relative to the human's physiologic responses to and capacity for exercise
2. Apply the principles of exercise physiology to help themselves and others achieve optimum work performance
3. Provide intelligent and factual answers related to the effects of work on the human body
4. Attain knowledge toward understanding current topics in the practice of exercise physiology
5. Demonstrate the ability critically review current research and link findings with those discussed in the lab/seminars

Course Overview:
The material for the lecture portion of this class will be presented in lecture/discussion format. All class lectures are available in PowerPoint 2007 format, and are found on BLACKBOARD. Assessment will include 4 unit examinations for the lecture portion of the class and a final exam. In addition, there will be 1 – 12 article reviews based on assignments given in the lab portion of the class.

Required Readings:
No texts are required but you may want to pick up the following texts to facilitate your learning of class material

Articles to be assigned in class. (REQUIRED)

Class Policies:

✓ Attendance is not required for the lecture or the lab, but is imperative for success in this class. The student is responsible for any information presented, discussed and assigned in class regardless of whether or not the student was present. Make-up tests, quizzes, assignments, or other grades will be granted for excused absences only:
  • serious illness (doctor’s note required)
  • official university excused absences (with proper documentation and prior notification)
  • extenuating circumstances (PRIOR approval should be obtained or direct contact made with the instructor within 24 hours of the event)
  • Please be aware that any student who does not attend the lecture during the initial drop/add phase and has not communicated with me is subject to being administratively dropped from the roster. Roll will be taken up until the last day to add a class only and will not be used in grade calculation with the exception of possible extra credit which will be dealt with at the discretion of the instructor.

✓ When contacting the instructor in reference to class issues via e-mail or other method (for example a note in my mail box or on my office door), if you do not receive confirmation that I have received your message, project, etc., within a reasonable time period (2 work days), then I did not get it! In other words, if you do not hear back from me, please follow up to make sure we are communicating effectively!

✓ Please check Blackboard e-mail account prior to coming to class. If I am ill or there is a change in the class location, materials required, or meeting time, I will send an e-mail out via blackboard to all of your Mason student accounts.

✓ Students are always encouraged to come to office hours in order to ask additional questions on the material.

✓ All students are expected to conduct their work for this class as spelled out in the George Mason University Honor Code. All class projects are subject to evaluation under plagiarism detection software such as “Turn It In” or “SafeAssign”.

✓ Student employment does not take priority over academic obligations. I recognize that many students need to work in order to meet living expenses, however, there are distinct guidelines for students in terms of the number of credit hours which should be attempted based on how many hours per week a student has outside employment. For additional information on this subject, please see the GMU student handbook.

Evaluation:

EXAM REVIEWS:
As time allows in class and depending on class progress in each unit, a review may be offered before each exam. At that time, students can ask any content question that they would like. Students are not required to participate in the review, and can participate or leave as they choose. If there are no questions related to the content of the unit, the review session will be ended. Whether or not a review is conducted in class depends on class progress through the material for each unit and class participation in previous reviews. If there is no time to have a formal review or, if review sessions are not being utilized, students will need to come to office hours to address any questions on class material.
UNIT EXAMS:
There will be 4 unit exams worth 30 points each. Unit exams will be in short answer/written format. Following handing out of exams and any announcements, you will have the remainder of the class period to complete unit examinations 1 – 4. Please return exams promptly when time is called. Students who give prior notification for a university excused absence will be allowed to complete an alternate version of the exam outside of class. Students who miss an exam for what would not be considered a university excused absence or who do not give prior notification of excused absences will not be allowed to take the exam at an alternate time. Exams one – four will be given during normal class times.

EXAM PICKUP:
For privacy reason, students are not allowed to pick up exams for other students without my having prior written permission from the student who’s exam is being collected. If you have extenuating circumstances and wish to e-mail me permission prior to handing back exams, I will be more than happy to allow the person designated in your letter to pick up your exam.

TEST REDEMPTION:
Since the major purpose of this course is to establish whether or not a student has an understanding of exercise physiology principles and can explain these principles to others, students will be given a second chance to show that they do understand the material and are able to communicate that knowledge. Following the first three unit exams, for any sub-question that a student earns \( \leq \frac{1}{2} \) of their points, the student can meet with the instructor to explain the information verbally and answer additional questions, (without notes), and earn some points back toward their grade. The amount of points a student may earn is limited to \( \frac{1}{2} \) of the points missed on a particular sub-question.

For Example: If a student earns a score of 2 out of 4 possible points on sub-question 3-B, then the student may earn back 1 point with a successful redemption. If the same student earns a score of 1.25 out of 3 possible points on sub-question 4-C, then the student may earn back 0.75 points with a successful redemption. If the same student earned a score of 2 out of 3 possible points on sub-question 5-A, that question is not eligible for redemption. The amount of points that are earned back during any test redemption is at the discretion of the instructor and will be based on the completeness and accuracy of information presented, as well as the ability answer follow-on questions related to that material.

Please make sure when signing up for a redemption time that you are 100% certain that you will be able to attend that time. There are a set amount of slots available based on the number of students in the class and once they are filled no further slots will be allocated. If you sign up for a time and need to change it at a later date, you will only be allowed to do so if other slots are open or if you can switch your spot with another willing student. Please be on time to your redemption time. If you are late and/or miss your spot, you will not have an opportunity to do the redemption for that exam. Students are not allowed to sign up for redemption slots for other students. There will be no redemption for unit exam four.

Redemption slots are 15 minutes long. Students will only be allowed to redeem those questions that can be covered in the allotted time. If a student cannot answer questions related to the material within a reasonable amount of time, we will move on to the next question. If time allows, we may return to earlier questions but this is not guaranteed due to time constraints. In other words, if you are not prepared for the redemption appointment, you will limit the number of questions we have time to cover.

EXAM FOUR BONUS QUESTION:
On exam four there will be no test redemption. However, there will be one bonus question in the same format as other test questions. This question will be worth a possible 4 points. The final grade on the exam will still be determined out of a possible 30 points with a maximum of 30 possible points. For example, if you get a 28/30 on the regular portion of the exam, the max you can earn on the bonus question is 2 points. If you earn \( \leq 25/30 \), you
can earn the full 4 points on the bonus for an exam grade maximum of 29/30. Participation in the bonus question cannot hurt your grade, it can only help you.

FINAL EXAM:
The final exam will be similar in format to the unit exams but will cover information presented in the lab/seminar portion of the course. Students will be expected to answer questions related to practical application of exercise physiology concepts, cite relevant literature to support their claims on specific topics, and point out areas which represent gaps in the literature that should be explored in the future. Students will also be evaluated as to their ability to utilize the information presented in class to their specific area of study (e.g. PHED, ATEP, Ex Sci, etc.) and contrast the current body of evidence with currently accepted or common practices in said fields of study.

Students must bring two bluebooks to the final exam session. Any student who does not have two bluebooks will not be allowed to sit for the exam.

There are no bonus or redemption points on the final exam. However, students will be allowed to choose certain questions that they wish to answer out of the total amount of questions presented. For example, there may be 12 questions and the students may be required to complete 8 out of the 12. The actual number of questions will be determined at a later date and will be announced to the students in class as well as on blackboard via mass e-mail. This information will be announced no later than 1 month prior to the final exam in order to allow students sufficient time to prepare.

ARTICLE REVIEWS:
There will be 1 – 12 article reviews worth 5 points each. The number and content of reviews will depend on class progress throughout the semester. The article reviews will be related to practical application of exercise science principles that will be covered as part of the laboratory and lecture portion of the class. On days that article reviews are due, papers will be collected at the beginning of class. If an article review is turned in within the first 24 hours after it is due, the assignment will be graded as normal and then 1/3 of the earned points will be taken off of the grade as a late turn in penalty. If the assignment is turned in from 24 – 48 hours late, the article review will be graded as normal and then 2/3 of the earned points will be taken off for late turn in. Articles turned in more than 48 hours late will not be accepted and students will earn zero points. If there is a university excused absence, article reviews can be turned in at a time arranged between the student and the instructor, with prior approval. Late article reviews will not be accepted for full credit without prior approval from the instructor. Students are required to turn in a full text paper copy version of the article that they reviewed. Electronic article reviews or articles will not be accepted. All work will be subject to scrutiny by plagiarism detection software such as Turnitin or SafeAssign.

POINTS POSSIBLE BREAKDOWN:
4 Unit Exams * 30 pts. each = 120 Points
Final exam = 30 Points
1 – 12 Article Reviews * 5 pts. each = 5 – 60 Points
• TOTAL POINTS POSSIBLE: = 155 – 210 Points
GRADING SCALE:
Student’s letter grade is based on the individual point score converted into a percentage grade. Based upon the student’s class performance the following letter grades will be assigned:

98 – 100 % = A+
93 – 97.99 % = A
90 – 92.99% = A-

87 – 89.99 % = B+
83 – 86.99 % = B
80 – 82.99 % = B-

77 – 79.99 % = C+
73 – 76.99 % = C
70 – 72.99 % = C-

60 – 69.99 % = D
< 60 % = F

Minimally Acceptable

GRADING PROCEDURES:
An example of a C grade for an exam could be, knowing the basic tenants of a concept discussed in class and basic competency with practical exercises such that it is evident that the person has read the material but has poor understanding. An A grade on an exam could be having a complete understanding of all material to a level of detail that goes beyond memorization of the notes, and a demonstrated ability to make extensions of the material to several different exercise and work situations.

An example of a C grade on an assignment could be providing the minimum information required and having an acceptable format with acceptable grammatical structure. An example of an A grade on an assignment would be providing all information required, presenting information in a logical and professional manner, writing in a clear and grammatically correct fashion, use of correct citation methods, use of appropriate sources for citation, use of proper units of measurement such as SI units, and a well thought out/logical interpretation/discussion of results and information.

Please remember, a C is average, an A is exceptional. Your work will be graded accordingly.

GRADING CONCERNS:
Students who believe there is a grading error or who do not understand why they earned a particular score on unit exams 1 - 4 are encouraged to sign up for a redemption slot to address their concerns at that time. Once the redemption process is complete, grades for that particular exam will be set. Please be sure to address any grading concerns you have on unit exams 1 – 4 during that process.

Students who feel there is a grading error or who wish to gain greater knowledge as to why a particular grade was earned on a homework assignment have one week following the date papers are handed back to the class to express their concerns. Following that one-week period, all homework grades are set and will not be altered. Students are encouraged to come and look at their grade on the final exam prior to submission of final grades via Patriot Web. After submission is complete, no grade alterations will be made so please come by during office hours of finals week if you have concerns.

NO STUDENT WILL BE THOUGH OF ANY DIFFERENTLY OR PUNISHED IN ANY WAY FOR BRINGING A POTENTIAL GRADE CONCERN TO MY ATTENTION. I want all students to walk away with an understanding
of why you earned the grade that you did. In addition, I want to make sure that any potential mistakes in grading on
my part are taken care of immediately.

Assumption of risk:
As with any activity there is an assumed risk while participating. We will do all we can to provide a safe
environment; however, you are ultimately responsible for your well-being. The university will not be held liable
for any injuries that occur.

Any student who has a documented medical condition, (e.g. Asthma, Hypertension, Cardiac Condition, etc.), or
any injury that may preclude participation in a specific activity should inform the instructor immediately.
Arrangements will be made with an alternate activity for your participation.

The instructor reserves the right to make changes to the course syllabus and/or schedule at any time.
Students will always be informed of any changes made.

Tentative course outline - Lecture:

Unit #1: The Bioenergetics of Work and Exercise
Topics: 1. Enzymatic energy systems
        2. Fuels for exercise
        3. Exercise recovery
        4. Adaptations and implications for training and performance

Unit #2: The Endocrine System in Exercise and Performance
Topics: 1. Basic structure and function of hormones and tissues
        2. Response of hormones to aerobic training
        3. Endocrine response to anaerobic training
        4. Implications for training
        5. The role of the endocrine system in substrate availability for work performance

Unit #3: The Role of the Neuromuscular System in Work and Exercise
Topics: 1. Nervous system
        2. Structure and function of skeletal muscle
        3. The cross-bridge cycle and power production
        4. Manipulating power
        5. Muscle soreness
        6. Adaptations to training

Unit #4: The Role of the Cardiovascular and Respiratory systems in Work and Exercise
Topics: 1. Respiration during exercise
        2. Acid-Base balance during exercise
        3. Circulatory adaptations to exercise
        4. Cardiac and smooth muscle physiology
        5. Factors controlling oxygen consumption
        6. Response to acute and chronic training
**Tentative schedule – Lecture:**

Week 1 – Aug 30\textsuperscript{th}
- Tues: Syllabus, course intro, and Bioenergetics
- Thurs: Bioenergetics

Week 2 – Sep 6\textsuperscript{th}
- Tues: Bioenergetics
- Thurs: Bioenergetics

Week 3 – Sep 13\textsuperscript{th}
- Tues: Bioenergetics
- Thurs: Bioenergetics, and in-class review if time allows

Week 4 – Sep 20\textsuperscript{th}
- Tues: *Unit Exam 1*
- Thurs: Endocrinology

Week 5 – Sep 27\textsuperscript{th}
- Tues: Endocrinology
- Thurs: Endocrinology

Week 6 – Oct 4\textsuperscript{th}
- Tues: Endocrinology
- Thurs: Endocrinology

Week 7 – Oct 11\textsuperscript{th}
- Tues: NO CLASS
- Thurs: Endocrinology, and in-class review if time allows

Week 8 – Oct 18\textsuperscript{th}
- Tues: *Unit Exam 2*
- Thurs: Neuromuscular

Week 9 – Oct 25\textsuperscript{th}
- Tues: Neuromuscular
- Thurs: Neuromuscular

Week 10 – Nov 1\textsuperscript{st}
- Tues: Neuromuscular
- Thurs: Neuromuscular

Week 11 – Nov 8\textsuperscript{th}
- Tues: Neuromuscular, and in-class review if time allows
- Thurs: *Unit Exam 3*

Week 12 – Nov 15\textsuperscript{th}
- Tues: Respiratory and Cardiovascular
- Thurs: Respiratory and Cardiovascular

Week 13 – Nov 22\textsuperscript{nd}
- Tues: Respiratory and Cardiovascular
- Thurs: NO CLASS

Week 14 – Nov 29\textsuperscript{th}
- Tues: Respiratory and Cardiovascular
- Thurs: Respiratory and Cardiovascular

Week 15 – Dec 6\textsuperscript{th}
- Tues: Respiratory and Cardiovascular, and in-class review if time allows
- Thurs: *Unit Exam 4*

*Final Exam*: Tues, Dec 16\textsuperscript{th}, 7:30 – 10:15 AM
ARTICLE REVIEWS – Sample Format

- Intro
  o Definition of any important terms
  o Highlight the author’s review of literature and the identification for the need for this particular research
  o What was the purpose of this work, was it justified in your opinion? Why or why not?
  o What was the hypothesis?

- Methods
  o Subject Data/Demographics
  o Description of protocols used – Reference and explain what the tests are design to investigate
  o Equipment needed, detailed description of type, manufacturer, and location
  o Any Statistical tests performed (If Needed) – explain why individual statistical treatments were chosen, what those tests are designed to accomplish, and whether or not they met the assumptions required to perform the test.
  o Were the methods appropriate? Why or why not? – Does the overall study design allow the investigator to actually measure the phenomenon they are trying to test? Explain in detail.

- Results
  o Summary and/or table/graphic representation of the results reported by the author(s)

- Discussion
  o What was the authors’ interpretation of their findings? Do you agree, why or why not?
  o Did they match the original hypothesis?
  o Relate back to important points highlighted in the introduction
  o Do the results obtained by the author(s) match what is found in the body of literature prior to this study being performed?

- Conclusion
  o What is the take home message, summarize the most important findings and tell why they are important.
  o What do these results mean to YOU? How can you use them in your profession?
  o What are some future directions related to this topic that should be researched?

✓ Hints for success on Article reviews:
  o Reference everything as needed (AMA format)
  o Always state units of measurement
  o Use SI units
  o Related conclusions from authors as well as your own personal conclusions back to the theory learned in the lecture as well as the broader theme of what was presented in the lab related to this material.
  o Double space and use times’ new roman 12 pt. font.
  o Label all graphs and tables clearly
    - References/sources MUST be either a recent (within the past 5 years) peer-reviewed journal article of original research. No textbooks or review articles, though those can be very helpful in finding articles of interest.
    - Websites, popular media, or opinion type articles are NOT acceptable sources – you can, however use those sources to track down their references for use in your own report/project
    - If you have any questions about the sources you are planning on using feel free to check with me ahead of time and I will be more than happy to give you some feedback or steer you in the right direction.

o  http://writingcenter.gmu.edu/index.php
- All students are held to the standards of the George Mason University Honor Code [See http://www.gmu.edu/catalog/apolicies/#Anchor12]

- University policy states that all sound emitting devices shall be turned off during class unless otherwise authorized by the professor

- Students with disabilities who seek accommodations in a course must be registered with the Disability Resource Center (DRC) and inform the instructor, in writing, at the beginning of the semester [See www.gmu.edu/student/drc]

- For additional School of Recreation, Health, and Tourism information, please visit the website at http://rht.gmu.edu