

Topics in Biology: Exercise Physiology

Spring 2003 Syllabus

Dr. Ken Prestwich
Office: O'Neil 108

Class on M, W, and F at 8 AM in O'Neil 101

Office Hours: Tue. & Thur. 8-9:30, Wed & Fri. 12 - 1:30

Review Sessions: We will have review sessions in the late afternoon about every two weeks as needed.

Course website and class schedule:

<http://www.holycross.edu/departments/biology/kprestwi/exphys/>

Textbook: S. K. Powers and E. T. Howley. *Exercise Physiology*. Fourth edition. McGraw-Hill. Please do not get an earlier edition.

About the Course: This will be, I hope, far more than an exercise physiology course. Although we will focus on the mechanisms that account for physical performance, we will also:

- examine and critique the scientific process,
- examine issues relating to the roles of genes, environment, race and sex in performance; and, hopefully,
- we will learn how to debunk the often plausible yet ridiculous or even dangerous claims of businesses selling supplements, drugs, and sports equipment. Thus, some emphasis will be placed on making you sophisticated consumers of sports-related products.

Being able to look critically at science and ideas supposedly derived from science (for example, training and nutrition claims) requires the development of a reasonably sophisticated understanding of science. That is the most important thing you can take away from this course -- a knowledge base, a familiarity with where to go to get more information, and the logical tools required in judging scientific claims. Thus, this is a science course. **It is NOT a course focused mainly on training techniques, nutrition, or health.** You will learn about the scientific process as it is applied to the study of an interesting topic -- human performance. In the process, you will learn something about how the body functions and how knowledge of physiology leads to rational training regimes and realization of a healthful, enjoyable life.

Physiological science is not beyond the comprehension of any Holy Cross student who is willing to put in the time required to achieve comprehension. There is a requirement for learning both a thought process and "data base" To master the course material, I expect you to attend all classes, and put in about 7 to 10 hours of per week outside of class. Outside time should be devoted to reading the course material and thinking about and discussing the homework

problems and questions. *Urge you-- please do not to concentrate all of your studies near exams*; those who have done so in the past have seldom done well. You will find that I am pleased to go over material in class and answer questions both inside and outside of class, provided I believe that you have made an effort to understand readings and previous classes.

Class Format: Class will be a mix of lecture and discussion. Lecture notes, reading study questions, and problems will be distributed via the class webpage prior to class (in most cases). The idea of distributing notes is so that we can spend time only on the sections you have trouble understanding and so that you spend less time writing. Handing notes out via the web is not a device to allow you to miss class. You are expected to attend all classes and missing class will adversely affect your quiz and participation grade.

The URL of the class website is:

<http://www.holycross.edu/departments/biology/kprestwi/expphys/>

It can also be found by going to my homepage or the "Electronic Resources" page at the Biology Department homesite. Please note that **this is not a blackboard page** but is instead a "normal" web page.

Regarding our textbook: Be aware that we will not strictly follow the textbook but will instead use it as a reader and reference source. You should read each assigned chapter but use the study questions to guide you to the material that is most significant for our class (read this as material you will be tested on!).

Grading: Grades will be based on the following measures:

<u>Source</u>	<u>Points</u>
2 Midterm exams (100 pts. each)	200 (33 %)
One Mini-Exam (25 min, 40 pts.)	40 (7%)
Final Exam (Partially Comprehensive)	150 (25 %)
Quizzes and Participation	110 (18%)
Short papers (50 points each)	100 (17%)
Total	600

Exams and the mini-exam will consist of about 70% objective-type questions (multiple choice, fill-ins, definitions, and when appropriate, problems) and the remainder essay (usually one or two per exam). As in any science course, emphasis will be on a **precise understanding of the factual knowledge, interpretation of these facts**, and on the **methodologies** used in exercise physiology. An important note: objective exams are not all memorization. It is quite easy to design objective questions that require you to think and a certain percentage of the objective questions on our exams will be so designed. However, if you have been an active participant in discussion and have kept up, you should be well-prepared to answer all types of questions.

All exams, especially the final exam, are comprehensive. What this means is that major concepts and important pieces of factual information, especially those which members of the class have had difficulty with, will show up on more than one exam. My purpose here is not punishment but learning. I especially want to discourage "cramming" for exams.

Since our class meets at 8 AM and therefore there is no class occupying room 101 before, you may start your exams at 7:45 (but no later than 8 AM).

Quizzes and Participation: There will be an indeterminate number of quizzes spread over the semester. Each will be worth 6 to 10 points. They will be either announced or unannounced, will always be at the start of class and will take about five minutes to complete. There are **no make-ups for quizzes**. If you arrive in class late, you will have to turn in your quiz at the same time as everyone else. Quizzes cover material dealing with the last two or three classes and associated assignments. The purpose of the quizzes is to encourage you to keep up and to give you experience with the same types of questions that I use on exams.

The better the class participation and class performance on exams, generally the fewer the quizzes. Thus, the exact number of quiz points is not set, it will probably be around 40 pts but could be higher or lower (you will be apprised of this in class).

The remainder of the points will be given as a participation grade. It will be arrived at in a number of ways. For instance, on a number of occasions I will simply ask you to submit questions (in writing) based on lecture and readings. We will in turn discuss some of these in class. In addition, you will see that I run a class that is a mix between lecture, question and answer, and hopefully, discussion. Everyone will be asked to participate and grades will be based on preparation and the thoughtfulness of what you have to say. You can learn your present participation grade at any point simply by asking; you will also be given your grade in participation when each exam is returned. Please note that missing class will adversely affect your participation grade.

Papers: There are two papers, each worth 50 points. These will be five pages in length and will take the form of a researched essay related to a major theme in class. All will be submitted electronically. Late papers are not accepted unless excused by the Class Dean.

Grading Scale: Grades are based on a scale, not a curve. I use the following scale: above 93 = A, 93 to 90 = A-, 89 to 87 = B+, 86 to 83 = B, 82 to 80 = B-, 79 to 77 = B+, 76 to 73 = B, 72 to 70 = C, 69 to 67 = D+ and 66 to 60 = D. Any average below 60 fails. Thus to earn an A in this course you will need at least 493 points ($530 * 0.93$). Similar calculations can be made for other grades.

There is **absolutely no extra credit** in this course. **If you must miss an exam** because of a college-sanctioned activity (such as a sport team trip) or a medical appointment, you will normally be expected to take the exam before

leaving on the trip. If you miss an exam because you sick, you will only be excused if you obtain an excuse from your class dean. **All unexcused exams and quizzes are graded as zeros** (see special note about quizzes, above).

Academic Honesty: Honest is the foundation of the academic and scientific enterprise. If we are assured of an honest environment, class morale tends to be good and the trust allows for a high degree of respect. Therefore dishonesty in the form of cheating¹ on exams, quizzes and papers or falsifying an excuse for a missed exam or assignment will not be tolerated. Anyone whom I have sufficient reason to believe has cheated or lied will receive a zero for the exam or quiz and a report of the incident will be relayed to the appropriate class dean.

Order of Topics - (Please note that this schedule is tentative)

- I. An overview of science, biology, and exercise physiology
- II. Measuring performance
- III. Cellular and Tissue Biology of Exercise
 - A. Function: Muscles, the skeleton, and neural control
 - B. Function: energy production
 - C. Function: genes, muscles and metabolism (genes and the microphenotype)
- IV. Organ and Organismal Physiology
 - A. The circulation
 - B. Respiration
 - C. Water balance during exercise
 - D. Temperature regulation and exercise
- V. Performance and the macrophenotype.
 - A. Nature/Nurture and the phenotype (as measured by athletic performance)
 - B. This biologists (and many others) view of "race" and "race" and performance.
 - C. Differences in performance between women and men
- VI. Training, Diet, Supplements and Performance
 - A. Training for strength, power and aerobic capacity
 - B. Diet and fluids
 - C. "Supplements"

Schedule of Papers and Exam:

Date	Assignment
Friday Jan. 31	Mini-exam
Friday Feb. 28	Exam #1
Friday, March 21	First Paper
Friday April 4	Exam #2
Wednesday April 16	Second Paper
Thursday May 8 at 2:30 PM	Final Exam

¹ Cheating is defined as taking, receiving, or intentionally giving aid -- except where explicitly allowed.

