COURSE OUTLINE

EXRS 2010: Introduction to Exercise ScienceI. Course Information

A. Location - Room 203 Ramsey

B. Class Days & Time - Monday & Wednesday 1:25 to 2:15 pm

II. Instructor Information

A. Coordinator - Patrick J. O'Connor
B. Office Location - Room 115-L Ramsey Center
C. Office Hours - Mon & Weds 3:30-4:30 pm or by appointment
D. Office Phone - 542-4382
E. Email: poconnor@coe.uga.edu

III. Prerequisites - None

IV. Primary Objectives

A. To provide students an understanding of the breadth of the field of exercise science.
B. To gain an appreciation for the major questions being addressed and approaches being used by exercise and sport scientists.
C. To expose students to vocational opportunities within the field of exercise science.

V. Course Description: This course introduces students to the field of exercise science and the department of exercise science at the University of Georgia. This is done primarily by having departmental faculty and invited speakers discuss their area of expertise. Some introductory material about physical activity and health also is presented in readings. Note that this syllabus is a general plan for the course, and deviations announced to the class by the instructor may be necessary.

VI. Readings You will be required to read one chapter from the Surgeon General's Report on Physical Activity and Health (i.e., Chapter 4 titled "The Effects of Physical Activity on Health and Disease"). The chapter is available for purchase at Athens Blueprint located at 269 W. Dougherty (corner of Prince and Pulaski). The phone number is 548-0656.

VII. How your grade is earned

A. Attendance (0%). Daily attendance is not required and does not directly effect your grade. Failure to attend, however, will indirectly influence your grade since a substantial amount of the exam material is covered only in lecture.

B. Electronic Data Base Research (25% - Due Weds October 27th). One purpose of this assignment is for you to learn how to access and retrieve academic exercise science-related material using electronic data bases. A second purpose is for you to learn about an exercise science topic of interest to you.

Step 1. Identify an exercise-related question: (i) that you are interested in knowing the answer to, and (ii) about which research results have been published. If there is little or no published research on the topic that interests you then you will need to find another topic.

Since it is common for people to be interested in a specific exercise and health topic about which

little or no research has been conducted, the best first step is to learn if there is any published research on a **GENERAL** exercise and health topic of interest. You will do this by searching on a general topic in one or all of three major medical/ science data bases: *PsycINFO, Medline*, *and Current Contents.* These data bases are available at the University's Galileo webpage: http://www.galileo.peachnet.edu/ *PsycINFO* [this data base is listed on Galileo under "Social Science" and consists of psychology research articles], *Medline* [this data base is listed under "Medicine and Health" and contains research articles related to medicine], and *Current Contents* [this data base is listed under "Science and Technology" contains biological sciences and medically-related research articles].

Go to these data bases and enter a minimum of two terms. One term should be either "exercise" or "physical activity" or "fitness" or "inactivity" or a specific sport or activity such as soccer or volleyball. The other term should be your general topic of interest. General topics include (but are not limited to) the effects of exercise on muscle, bone, heart, heart disease, blood pressure, cholesterol, diabetes, mortality, metabolism, stroke, cancer, osteoarthritis, pain, obesity, chronic obstructive pulmonary disease, immunity, anxiety, depression, eating disorders, personality, self esteem, and sleep. Other general topics include perceived exertion, biomechanics, gait, footwear, hormones, aging, altitude, knee and other injuries, running, cycling or swimming performance.

When you see the results of your search you will find that many of the published research articles have a very narrow focus. This fact will be useful to you because it will narrow the scope of your assignment. You will not be able to provide a good answer to a question such as - what is the effects of exercise on immunity because the topic is too broad and complex. To get full credit you will want to find a specific question about which there are several research papers that provided an answer. For instance, a specific question (e.g., "Does visualization improve free throw shooting?") is much better than a more general question (e.g., "Does visualization improve athletic performance?") which itself is much better than the following vague question - ("Do psychological factors improve sports performance?"). It is expected that some topics will yield lots of articles from one data base but zero articles from the other data bases. For example, articles on the topic "Does visualization improve free throw shooting?" are expected to be found in the PsycINFO data base (but not in the Medline data base) because the question primarily concerns psychology not medicine.

You may obtain and read review articles in order to put your research topic into proper perspective, however, your focus should be on data-based articles and NOT on review articles. Data based articles contain data. That is, it is mentioned in the article that subjects were tested, methods of testing are described, and tables or figures of the data are presented. Review articles summarize a host of data based articles. Review articles can often be identified because they have the word "review" in the title or they have the word "meta-analysis" in the title, and they present no data. If you do come across a review article on a topic of interest, you may benefit by reading it and finding the data based articles in the reference list that the authors of the review paper read and used to address your question. You can then obtain these data based articles and use them for this assignment.

After you have searched the data bases and found the titles and abstracts of articles that seem generally interesting, you next need narrow your topic. Specifically, you are to find three articles that answer a specific question. You might be able to do this based solely on what is described in the abstract, however, for this assignment you will need to hand in a complete copy (including the reference list) of the three articles. This is done either by making a copy of journal articles that are physically housed in the library or by downloading the article from the web. Many science and medical journals make copies of articles available over the web for a fee. Since UGA pays this fee you may be able to obtain the articles you need via campus computers without physically going into the library. A great source for obtaining journal articles electronically at UGA is at the following web site: http://www.libs.uga.edu/ejournals/ Many articles cannot be obtained electronically and this will require you to go to the library.

If you find only one article on your topic of interest, look in the reference list at the end of the article in order to attempt to identify additional related articles. Related articles are often listed in the reference list. It is estimated that you will be able to find only ~50% of all the published articles on a topic using an electronic data base because of the limitations in the electronic data bases (e.g., people use different words in the titles of the articles).

Step 2. Once you think that you have identified an appropriate topic, inform the instructor as to the question that you want to pursue. This is best done by email or in the computer classes held that you will attend either on August 30 or Sept 1 or 13. He will either OK it, tell you to change it and make it more specific, or he will tell you to find a new question because someone else has selected your question. No two students will be allowed to pursue the exact same question. You will lose points if you do not get your question OK'd by the instructor.

Step 3. Once your topic is approved, then obtain copies of the three articles that appear to be most useful in addressing your question. Read these articles and find out the answer to your question. You will need to hand in a copy of each of these three articles. NOTE; A COPY OF THE ABSTRACT ONLY IS NOT ACCEPTABLE.

Step 4. Submit a typed summary that includes: (1) your question in a question format, (2) your brief answer to the question, and (3) a reference list of the articles you used (the references can be listed in any format). At the end of this document attach a copy of the three articles that you used to answer your question. The assignment does not have to be long, your question should be answerable in one page (SEE EXAMPLE PROVIDED ON THE PAGE FOLLOWING THIS COURSE OUTLINE.

C. Midterm & Final Exam (25% each - Wednesday October 13th and Friday December 17th). The midterm and final exam may include multiple choice, matching, short answer and fill-in type questions. The midterm exam will be based entirely on the lectures. The final exam will not be comprehensive, and it will be based on both the reading and the lectures presented after the first midterm. The reading consists of a single chapter (90 pages) from the Surgeon General's report on Physical Activity and Health. You will not be expected to know the details from the many tables presented in this chapter, but rather you will be expected to know the ***conclusions*** that are presented. Unfair or invalid exam questions, as determined by item analysis performed while scoring the exams, will be dropped from each exam.

D. Paper (25% - due Wednesday December 8). You are to write a paper about an exercise science-related career of interest. The paper should have the following sections: (A) Description of the Career, (B) Requirements for Success, (C) A List of Sources of Information about the Field of Interest, and (D) A job announcement and resume. In section A, describe what the career entails, the service it provides to society, who is involved in the field (e.g., any demographics that you can find such as the percentage of females vs males and the names of a few notable people [local and/or national] in the field), and something about its' history. In section B, describe what is required for people to first, successfully gain entry into the career, and second become successful in the career. This section should include information, for example, on the education and training required and your definition of success. When possible you should identify both the minimum education required for the career (e.g., an M.D. degree) and the additional experiences that are needed for a person to become outstanding. In section C, identify a list of sources of information about the career of interest. Sources of information include people, textbooks, academic and professional journals, newsletters, professional organizations, electronic data bases, and web pages. You should provide a total of at least 5 separate sources of information (only one web page!). The list must provide a brief description of the information source and how to contact or access the information. For example, it is inadequate to simply indicate that the American College of Sports Medicine is a national organization providing information about sports medicine - the address, phone number, web page or other relevant contact

information must be included. In section D, create a fictional job announcement and resume. The job announcement should specify the "perfect" entry-level job as well as what the job entails and what qualifications are needed. Then create a fictional resume (1 page max) making yourself the "perfect" job candidate. You can use any reasonable format for the paper and resume. I will not grade on format, but I do expect there to be no spelling or grammatical errors. The point of this is for you to envision what is required for you to obtain a job that you are interested in.

G. Extra Credit (3% maximum - due on or before Wednesday December 8).

Student may earn extra credit either by reading and summarizing published scientific research or by participating as a subject in *exercise science* research (only if it is available). To get credit, you must get prior approval from the instructor and all work must be handed in to the instructor on or before December 3rd.

Students interested in the first option are required to obtain approval from the instructor about the exact research article(s) to be read and summarized. Appropriate articles are data-based original research articles. Data-based means that data were obtained and that the article does not simply review other articles. You can usually determine if the paper is appropriate from the title (the word "review" should not appear), and the abstract (in which the methods of the experiment are summarized and statistical results are provided).

Students interested in the second option will be informed in class of any ongoing research projects and will be able to sign up for participation at that time.

Both options require the completion of a 1-2 page summary that includes the following sections: (1) Rationale for the study, (2) Methods employed (i.e., what was done), (3) Results (or if not available in option #2 then your prediction of what the results will show), and (4) Discussion/Evaluation (what did you think of the study, are there ways the methods could have been improved?, were important consideration ignored or de-emphasized by the researchers?, was there anything that you really thought was effective, well done, or unique?). Critical to getting full credit is including a meaningful discussion/evaluation section. The hope is that material learned in class and/or from the readings will enhance your ability to discuss/evaluate the articles or the research you participated in. With the first option, up to 1% extra credit can be obtained for each scientific article read and summarized. Scores usually range from 0.5 to 1.0% depending upon the ability of the student and the care with which the write-up is performed. For the second option, participation in studies requiring 1-3 hours of participation time yield up to a maximum of 1% extra credit while up to 2% and 3% extra credit can be obtained from participation in studies requiring 3.1 to 6 hours and more than 6 hours, respectively. As with first option, getting the full extra credit depends on how well the write-up is done.

Grading

A= 90% of total points
B = 80 - 89.9% of total points
C = 70-79.9% of total points
D = 60-69.9% of total points
F = 59.9% of total points

Exam Policy

You are required to take the midterm and final exams on the scheduled dates at the scheduled time. Exams will not be administered early, and will be administered late only for personal emergencies (e.g., death in the family). Many commitments that may be important to you such as a family ski trip are not considered to be emergencies. PLEASE REVIEW THE DATE AND TIME OF THE EXAMS AND PLAN TO BE THERE.

2002 Reading and Lecture Schedule for EXRS 2010

Day	Date	Topic
T	Aug 20	Introduction to the course (Pasley)
Th	Aug 22	Basic background information about exercise and physical activity (O'Connor)
T	Aug 27	Introduction to exercise physiology (Cureton)
Th	Aug 29	Introduction to library resources at UGA (Cutshall)
T	Sept 3	Computer lab (Last name starts with A to H) - **HELD IN ROOM 214 OF RAMSEY**
Th	Sept 5	Computer lab (Last name starts with I to P) - **HELD IN ROOM 214 OF RAMSEY**
T	Sept 10	Computer lab (Last name starts with Q to Z) - **HELD IN ROOM 214 OF RAMSEY**
Th	Sept 12	Cardiovascular exercise physiology (McCully)
T	Sept 17	Cognition and motor skill acquisition (Tomporowski)
Th	Sept 19	Exercise and aging (Cress)
T	Sept 24	Exercise and sport psychology (O'Connor)
Th	Sept 26	NO CLASS - Instructor away at a professional conference
T	Oct 1	Cardiac rehabilitation (DuVal)
Th	Oct 3	Measurement and Evaluation (Baumgartner)
T	Oct 8	Exercise and Sport Nutrition (Lewis)
Th	Oct 10	MIDTERM EXAM 1
T	Oct 15	Clinical athletic training (Mandy Markley, 542-6936)
Th	Oct 17	Physical therapy (Lake)
T	Oct 22	School athletic training (Ferrara)
Th	Oct 24	Personal training (Dee Prince: 425-9797)
T	Oct 29	Spinal cord injuries/disabilities (Bickle)
Th	Oct 31	NO CLASS - FALL BREAK
T	Nov 5	Physician assistant (Henry hCurran@uhs.uga.edu)
Th	Nov 7	Occupational therapy (Barb bSchell@lib.brenau.edu)
T	Nov 12	Introduction to biomechanics (Simpson)
Th	Nov 14	Graduate school - (OConnor)
T	Nov 19	**Massage** (David Bothe)
Th	Nov 21	Medicine (Elliot)
T	Nov 26	Pre-med advising (McCully)
Th	Nov 28	THANKSGIVING - NO CLASS
T	Dec 3	**(Exam review)**
Th	Dec 5	MIDTERM EXAM 2

Student-Faculty Communication Sheet

Please read the six statements below. After each statement write your initials on the line to indicate that you have read the statement. At the bottom sign and date the form.

Review this, initial it in the spaces provided, sign at the bottom and hand it in to Dr. O'Connor. You will not be allowed to take the midterm until this signed form is turned in.

1. Daily attendance is not required and does not factor directly into my grade, however, I recognize that failing to attend may negatively impact on my course grade because much of the exam material is only covered during lectures. _____

2. I am required to take one midterm on October 13 and the final on Friday December 17th. Exams will not be administered early and will be administered late only for personal emergencies such as a major illness or a death in the family. Students will receive zero credit on exams missed for other reasons such as working at a part time job or travel associated with personal (e.g., job interviews) or other university responsibilities (e.g., athletics) unless approved with the instructor during the first week of classes. _____

3. Extra credit assignments not approved by the instructor or completed by December 8rd will not be accepted _____

4. I have reviewed my schedule for the semester and found no current or pending conflicts that would prevent me from taking the exams on the scheduled dates at the scheduled times. _____

5. I recognize that I am expected to conform to the UGA Student Honor Code_____. This means that: " I will be academically honest in all of my academic work and will not tolerate academic dishonesty of others." Academic honesty means performing all academic work without plagiarism, cheating, lying, tampering, stealing receiving unauthorized or illegitimate assistance from any other person, or using any source of information that is not common knowledge. Examples of academic dishonesty are copying answers from another student during an exam, giving a false excuse for failing to show up for an exam, obtaining advance exam copies by unauthorized means, and damaging a computer disk to prevent evaluation of the work on that disk. Students who assist other students in academically dishonest acts are in violation of the policy. Consequences of academic dishonesty may include receiving a lower grade, community service, a notation on the student's transcript, or suspension or expulsion from the University. Students have the responsibility for knowing the University's policy and procedures on academic dishonesty, which are described in the publication, A Culture of Honesty. Copies of this publication can be obtained from the Office of the Vice President for Instruction or may be viewed at the following web site: http://www.uga.edu/ovpi/.

6. I am aware that Dr. O'Connor has office hours from 3:30-4:30 on Mondays, and that I can get assistance from him regarding the course during these hours or at other times by making an appointment with him. _____

I have read and agree to the above policies:

_____ _____

Signature Date

EXRS 2010: Electronic Data-base Assignment - EXAMPLE

Ima A. Student

Question: What genetic changes occur shortly after a sport-induced skeletal muscle injury?

Answer: The readings that I did showed that there are a large number of genetic changes that occur shortly after muscle injury. For example, 24 hours after an injury was made to a mouse skeletal muscle (the tibialis anterior muscle) 2.8% of 732 genes examined were upregulated. These genes were related to inflammation and oxidative stress. A total of 3.2% of the examined genes were downregulated and these genes were involved in metabolism and cell signaling (Summan et al., 2003). A separate study of mice involved an injury made to the gastrocnemius muscle. The muscle tissue was examined for up to 14 days after the injury. The genetic changes that occurred within the first day after the injury were primarily those associated with inflammation such as those involved with the production or regulation of cytokines (Goetsch et al., 2003). My third paper specifically profiled the cytokine response to muscle injury and found that 40 of 522 cytokine genes were increased 48 hours after injury. The gene that increased the most was osteopontin, a regulator of inflammation and tissue repair. It increased by more than 118-fold 48 hours after injury (Hirata et al., 2003). In summary, I found out that my question was too broad - there are lots of genes that change after a skeletal muscle injury. The primary finding was that most of the genes that change shortly after a muscle injury are involved in inflammation.

References:

Goetsch SC, Hawke TJ, Gallardo TD, Richardson JA, Garry DJ. Transcriptional profiling and regulation of the extracellular matrix during muscle regeneration. Physiological Genomics. 2003 Jun 10 [Epub ahead of print].

Hirata A, Masuda S, Tamura T, Kai K, Ojima K, Fukase A, Motoyoshi K, Kamakura K, Miyagoe-Suzuki Y, Takeda S. Expression profiling of cytokines and related genes in regenerating skeletal muscle after cardiotoxin injection: a role for osteopontin. American Journal of Pathology, 2003, 163(1):203-15.

Summan M, McKinstry M, Warren GL, Hulderman T, Mishra D, Brumbaugh K, Luster MI, Simeonova PP. Inflammatory mediators and skeletal muscle injury: a DNA microarray analysis. Journal of Interferon and Cytokine Research, 2003, 23(5):237-45.