

COURSE OUTLINE
EXRS 2010: Introduction to Exercise Science

I. Course Information

- A. Location - Room 100 Forest Resources (Auditorium beneath main lobby of Forest Resources main building, Building 1140 on the campus map)
- B. Class Days & Time - Monday & Wednesday 1:25 to 2:15 pm

II. Instructor Information

- | | |
|---|------------------------------------|
| A. Coordinator Patrick J. O'Connor, Ph.D. | Teaching Assistant - Timothy Puetz |
| B. Office Location - Room 115-L Ramsey Center | Room 102-B |
| C. Office Hours - 1:30 to 2:30 Fridays
or by appointment | By appointment |
| D. Office Phone - 542-4382 | 542-4381 |
| E. Email: poconnor@uga.edu | twpuetz@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 some of 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 make presentations about 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: There is one reading for each exam - history for exam 1, technology for exam 2 and a summary of the Surgeon General's report for exam 3. The readings are available for purchase at Athens Blueprint located at 269 W. Dougherty (corner of Prince and Pulaski). The phone number is 548-0656. <http://www.cdc.gov/nccdphp/sgr/chap4.htm>

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% total; 20% for the 1-page summary that is due on September 26th and 5% for a copy of an email from the instructor indicating your topic has been approved and that the approval was obtained on or before September 14 at 4:30 pm [points will be taken off for topics with late approval or none at all]. One purpose of this assignment is for you to

learn how to access and retrieve scholarly exercise science-related material using electronic data bases. A second purpose is for you to learn in-depth, state-of-the-art information 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 either *Google Scholar* (<http://www.google.com/>) or one of the following major medical or psychological science data bases: Medical = *Medline* or *PubMed Psychological* = *PsycInfo* or *PsycArticles*. PubMed is found at <http://www.ncbi.nlm.nih.gov/entrez/query.fcgi>. The other data bases are available at the University's Galileo webpage: <http://www.galileo.peachnet.edu/> *PsycINFO* and *PsycArticles* are found in Galileo under "Social Science" and consists of psychology research articles. *Medline* is found in Galileo under "Medicine and Health" and contains research articles related to medicine.

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, fatigue, 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 need 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. Thus, you need to know what is meant by the term data-based article. Data based articles contain data. That is, it is mentioned in the article that animals or 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" "summary" or "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 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 if you are interested in any of these articles you will need to go to the library to make a copy.

Even if you find only one article on your topic of interest via computer searching, there is a good chance that ultimately you will be able to find two more articles because each paper has a reference list. 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. Get feedback from the instructor as to whether the question is adequate. Initially, this is best done in person just before or after class or in the computer classes held that you will attend either on August 29, 31 or Sept 7. It is often useful to bring copies of the abstracts or the full articles that you are considering. Regardless, the instructor will either OK the question, 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.

Step 3. Once your question is approved, then obtain copies of the three articles that are most similar in order to address 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 including the reference lists. **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). Use your own words, do not use the words of the authors whose work you are summarizing. At the end of this document attach a copy of the three articles that you used to answer your question. Also attach a copy of the email you received from the instructor approving the topic. The summary should be short, one page only. (SEE EXAMPLE PROVIDED ON THE PAGE FOLLOWING THIS COURSE OUTLINE.

The assignment will be graded on both substance (i.e., how accurately you summarized the research and drew a conclusion) and style (e.g., points will be taken off for failure to follow instructions as well as grammatical errors). Plagiarism will be alleged if you use the exact words of the authors in your summary without quotations and you may be assigned a grade of “F” for the paper.

C. Midterms & Final Exam (20% each - Monday October 10th, Wednesday November 9th, and Friday December 16th). The midterm and final exam may include multiple choice, matching, short answer and fill-in type questions. The midterm and final exams will be based on lectures and readings. The reading for the first exam is about the history of exercise science. The reading for the second exam is

about exercise, sport and material science. The reading for the third exam is a summary of the Surgeon General's report on physical activity and health. Invalid exam questions, as determined by item analysis performed when the exams are scored, will be dropped from each exam. The final exam is not comprehensive.

D. Fictitious Job Application (15% - due Wednesday December 7). The aims of this assignment are for you: (1) to learn where to find job announcements in a career field of interest to you, (2) to learn what educational background and other experiences are required or expected to get the job, and (3) to gain experience in applying for a career-type position.

There are three parts to this assignment. First, you need to find a real position announcement that comes close to your ideal job. The announcement must list the qualifications and responsibilities needed for the job. Obtain a hard copy of the job announcement to hand in. Position announcements can be obtained from various professional organizations and journals as well as the internet. An example of a position announcement is shown at the end of this course outline.

Second, create a fictional resume (1 page maximum). For full credit the resume must show that you meet the minimum qualifications for the job. You should also include other fictional experiences that make you an ideal candidate for the job. The format of the resume will not be graded, but points will be taken off for spelling or grammatical errors.

Third, write a 1 page maximum fictional business style letter applying for the job (see the example at the end of this course outline). The letter should emphasize how your experience meets the employers needs.

G. Extra Credit (3% maximum - due on or before Wednesday December 7).

Student may earn extra credit either: (1) by reading and summarizing published scientific research or (2) 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 on or before Wednesday October 26th. All work must be handed in to the instructor on or before December 7th.

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.

Tentative Lecture Schedule for EXRS 2010

<u>Class</u>	<u>Day</u>	<u>Date</u>	<u>Topic</u>
1	M	Aug 22	Introduction to the course (O'Connor)
2	W	Aug 24	Finding scientific articles electronically (O'Connor)
3	M	Aug 29	Computer lab (Last name starts with A to F) - ROOM 214 OF RAMSEY
4	W	Aug 31	Computer lab (Last name starts with G to Me) - ROOM 214 OF RAMSEY
	M	Sept 5	NO CLASS - LABOR DAY
5	W	Sept 7	Computer lab (Last name starts with Mi to Z) - ROOM 214 OF RAMSEY
6	M	Sept 12	Basic background information about exercise and physical activity (O'Connor)
7	W	Sept 14	¹ Question due today! Cardiovascular exercise physiology (McCully)
8	M	Sept 19	Overview of exercise physiology (Cureton)
9	W	Sept 21	Exercise and aging (Cress)
10	M	Sept 26	¹ Data-based research assignment due today! Muscle biology (Dudley)
11	W	Sept 28	Athletic training (Ferrara)
12	M	Oct 3	Exercise and sport psychology (Dishman)
13	W	Oct 5	Cognition and motor skill acquisition (Tompsonowski)
14	M	Oct 10	EXAM 1
15	W	Oct 12	Introduction to biomechanics (Simpson)
		Oct 14	Midpoint withdraw deadline
16	M	Oct 17	Measurement and Evaluation (Baumgartner)
17	W	Oct 19	Cardiac Rehabilitation (DuVal)
18	M	Oct 24	Personal training (Dee Prince: 425-9797)
19	W	Oct 26	¹ Approval for extra credit due today!
20	M	Oct 31	<i>Physician Assistant</i> (Kara Whyte)
21	W	Nov 2	Exercise and Sport Nutrition (Lewis)
22	M	Nov 7	Physical therapy (Lake)
23	W	Nov 9	EXAM 2
24	M	Nov 14	Osteopathic medicine - Doer?
25	W	Nov 16	<i>Occupational therapy</i> (Barb Schell; bschell@brenau.edu)
26	M	Nov 21	Graduate school - (O'Connor or graduate students)
	W	Nov 23	NO CLASS - THANKSGIVING
27	M	Nov 28	Pre-med advising (McCully)
28	W	Nov 30	Medicine (Elliot) or exercise and the military or 2 nd PT or massage
29	M	Dec 5	<i>Physical Activity Research at the Centers for Disease Control</i> (Bill Kohl)
30	W	Dec 7	(Exam review)
31	F	Dec 16	Final Exam - noon to 3 pm

¹See section above on how your grade is earned for details

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 first 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 two midterms on October 10 and November 9th and the final on Friday December 16th. 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 not completed by December 7rd will not be accepted and be given a score of zero _____

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. All students are responsible for maintaining the highest standards of honesty and integrity in every phase of their academic careers. The penalties for academic dishonesty are severe and ignorance is not an acceptable defense. 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 1:30-2:30 on Fridays, 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, McKinsty 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.