KIN/GRON 428 - Physical Activity & Exercise for Older Adults  
(Physical Dimensions of Aging)  
Spring 2016

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ACSM’s Senior Fitness Test Manual
ACSM’s Guidelines for Exercise Testing and Prescription

I. Course Description: This course is designed to familiarize the learner with the effects of aging on the different physiological functions in humans. A basic knowledge of cardiovascular, respiratory and musculoskeletal systems is necessary. The course will investigate the effects of exercise on the aging process. The course will also introduce fitness assessment and exercise prescription of aging as well as some of the chronic diseases associated with aging, such as hypertension, coronary heart disease, diabetes mellitus and arthritis.

II. Objectives (the learner will be able to):
   a. Describe aging and how it is measured.
   b. Examine the issues involved in trying to delay the aging process
   c. Show how physical aging affects the quality of life of all individuals
   d. Introduce the theories that are currently used to explain aging
   e. Explain between-group, and within-individual variability in aging
   f. Discuss several sources that contribute to the individuality of older adults
   g. Clarify how research design, test selection, and test administration can affect the appearance and interpretation of individual differences
   h. Describe the concept of biological age and how it contributes to individual differences
   i. Summarize changes in height, weight, and body mass index across the life span and discuss factors that affect these changes
   j. Identify the major changes in body composition in older adults and discuss factors that might modify these changes
   k. Describe joint changes with normal aging and osteoarthritis and the effects of exercise on joint structure and function
   l. Describe changes in skin with aging and what can be done to slow the aging effects
   m. Describe the changes in the structure and function of the cardiovascular system with age
n. Detail how aging affects the structure and function of the respiratory system
o. Clarify the extent to which regular physical activity may postpone age-related declines in the cardiovascular and respiratory systems
p. Describe the effects of aging on muscular strength and power
q. Detail the effects of resistance training on strength and power
r. Explain the relationship among strength, power and physical function
s. Identify ways in which the multiple systems in the body contribute to balance and mobility
t. Describe the important age-associated changes in posture, balance and locomotion
u. Describe how balance and gait are measured in laboratory settings
v. Identify the extrinsic and intrinsic risk factors that contribute to falls in older populations
w. Become familiar with the various types of intervention strategies used to lower the risk for falls among older adults
x. Describe how aging affects the speed with which older adults react and move about in their environment
y. Show how reactivity and movement speed are measured in older adults
z. Describe how changes in the sensorimotor system affect basic mechanisms of motor coordination and skill
aa. Describe the physical-psychosocial relationships between health, exercise, cognitive function and aging.
bb. Understand the physical performance and achievement capabilities of older adults.

III. Topic Outline

<table>
<thead>
<tr>
<th>Unit</th>
<th>Topic</th>
<th>Chapter</th>
<th>Readings</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Quantity and Quality of Life</td>
<td>1</td>
<td>Spirduso, 3-28</td>
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<td></td>
<td>Individual Differences</td>
<td>2</td>
<td>Spirduso, 31-50</td>
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<td>Physical Development and Decline</td>
<td>3</td>
<td>Spirduso, 55-82</td>
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<tr>
<td>2</td>
<td>Cardiovascular and Pulmonary Function</td>
<td>4</td>
<td>Spirduso, 87-101</td>
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<td></td>
<td>Muscular Strength and Power</td>
<td>5</td>
<td>Spirduso, 107-127</td>
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<tr>
<td></td>
<td>Balance, Posture, and Locomotion</td>
<td>6</td>
<td>Spirduso, 131-155</td>
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<tr>
<td></td>
<td>Behavioral Speed</td>
<td>7</td>
<td>Spirduso, 157-176</td>
</tr>
<tr>
<td></td>
<td>Motor Coordination and Control</td>
<td>8</td>
<td>Spirduso, 177-204</td>
</tr>
<tr>
<td>3</td>
<td>Health, Exercise and Cognitive Function</td>
<td>9</td>
<td>Spirduso, 211-232</td>
</tr>
<tr>
<td></td>
<td>Health Related Quality of Life</td>
<td>10</td>
<td>Spirduso, 233-260</td>
</tr>
<tr>
<td>4</td>
<td>Physical Function of Older Adults</td>
<td>11</td>
<td>Spirduso, 261-285</td>
</tr>
<tr>
<td></td>
<td>Physically Elite Older Adults</td>
<td>12</td>
<td>Spirduso, 287-316</td>
</tr>
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<td></td>
<td>Fitness Assessment of Older Adults</td>
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<td>ACSM’s Senior Fitness Test Manual</td>
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IV. Evaluation:

a. Exams: the midterm exam will cover Units 1 & 2; the final exam will cover units 3 & 4. Both exams are worth 100 points each. **Exams need to be scheduled and taken through the testing center at Morris Library** (http://testingservices.siu.edu/).

b. Article Critiques: two article critiques will be completed, one prior to the midterm and one prior to the final exam. Article critiques must be done on peer-reviewed original scientific articles – please ask me if you are unsure what a peer-reviewed original investigation is. Guidelines for the critiques are attached. Each critique is worth 50 points.

c. A review paper on a selected topic concerning aging and physical activity/exercise is due Friday February 5th. The topic must be approved by the instructor by the third week of the course. Guidelines for the review paper are attached. The paper is worth 100 points.

**Due Dates!**

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<tr>
<th>Assignment</th>
<th>Percentage</th>
<th>Dates</th>
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<tbody>
<tr>
<td>Critiques (2, 50 pts ea.)</td>
<td>25%</td>
<td>February 26 (1), April 8 (2)</td>
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<td>Midterm Exam (100 pts)</td>
<td>25%</td>
<td>March 7-11</td>
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<td>Review Paper (100 pts)</td>
<td>25%</td>
<td>April 29</td>
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<tr>
<td>Final Exam (100 pts)</td>
<td>25%</td>
<td>May 9-13</td>
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Critical Reviews of Research Articles (50 points each)

A 2-3 page (double-spaced, excluding references), type-written report is required for an article related to course material. The references in the back of the Physical Dimensions of Aging book would be a good place to start looking for these articles. The standardized format below must be followed:

Reading a scientific article is different from reading other kinds of texts. The writing densely packs so much information into a conventional format that just reading from beginning to end isn’t the best way to grasp all the ideas or to pick out the most important ones. These study questions prompt you to look for the key ideas any time you read a scientific article reporting research results (different questions are helpful when you read a review article).

1. **Heading.** Your name, date of report, and article citation.
2. What was the research issue—the unresolved area of science to which this study contributed? Think in terms of an answer that is smaller than “exercise physiology” and bigger than the focus of the immediate study, and that indicates something unresolved. Coordinate your answer with #3.
3. What is (are) the specific research question(s) that this study focused on? If there was a hypothesis, what was it?
4. What was the general research approach? Were participants humans or other animals? Was the study done in the laboratory or in some other arena (if so, what arena)? Was the data gathered by measurement or questionnaire?
5. What specific procedures did the researcher(s) employ?
6. What were the important terms of the paper, and were they defined in the paper?
7. What were the most important results? How do the authors interpret the meaning of the results? Is it a valid interpretation that is supported by the data?
8. What unique contribution did this study make to our scientific knowledge and/or practical applications?
9. What are some of the limitations of these results that these authors mention (by “limitations,” we mean factors that keep us from knowing all the answers)? Can you think of any that they didn’t mention?
10. After we add these results to the body of knowledge, what questions still remain about this issue?
11. Provide an example of a potential connection between this research and an area of interest that you have in the field of exercise physiology.
12. **References.** Your report should include properly cited literature to support statements. *You may only have the article you critiqued.*
Students must select and write an 8-10 page review of the literature on a specific topic in aging and exercise. Pick a topic in which you are interested. Make sure there are at least 10 articles about your topic from peer-reviewed or refereed journals! You must provide the instructor with your topic by email by the third week of class (February 5, 2016).

A review of literature should summarize current knowledge on a topic. All of your sources should be peer-reviewed original investigations. You may want to consult a review article that has been published to get an example of a literature review. A review does not just give details about each of the articles you have included, but synthesizes the body of knowledge that has been gained. Details of articles are given when necessary to make a point (i.e. methodology, participants, etc).

The paper should be organized similar to other papers in that you have an introduction, a body and a conclusion. Within the body of your paper you will organize your journal articles by logical content area (3-4 articles per section). Please contact the instructor if you are struggling with this organization or even if you are struggling to come up with a topic.

**Evaluation of the final paper:**

1. Length and format: 8-10 double spaced, full-length pages of text in APA format. This does not include the title or reference pages (5 points).
2. A clear and concise statement of the purpose of the paper (5 points).
3. Content and substance (70 points).
4. Validity of the conclusion: Is there support for the conclusion? (5 points)
5. Technical quality of the writing (10 points).
6. 10-15 sources from peer-reviewed research journals (see below for a list of examples of acceptable journals). Do not cite review papers (5 points).

This paper is due no later than 5pm on Friday April 29, 2016!