Kinesiology and Health Studies
University of Central Oklahoma
PHED 3503 – 10952 Physiology of Exercise

Instructor: Dr. Darla Fent  
E-mail: dfent@uco.edu

Office: Wantland Hall #12, Box 189, 974-3599  
Office Hours: M/W/F: 10 – 11 a.m.; T/R: 9 - 10 a.m.  
*Other times by appointment

Classroom Schedule: M-W-F 1:00-1:50 p.m. in HPE 014  
Credit Hours:  3

The College of Education and Professional Studies and the Department of Kinesiology and Health Studies are committed to helping students learn by providing a range of transformative learning experiences in discipline knowledge and in the five core areas: leadership; research, creative and scholarly activities; service learning and civic engagement; global and cultural competencies; and health and wellness

Course Description: The course will examine the physiological effects of exercise, the responses and adaptations of body systems to exercise, the essentials of an adequate diet, and the function of nutrients in exercise.

Course Prerequisite: HLTH 3223 – Applied Anatomy


General Course Objectives:
The student will develop a functional knowledge of the human body and the physiological adaptations of the body to physical activity. The student will also apply scientific principles to the coaching and teaching of physical activity and the conduction of an exercise program.

Specific Course Objectives:  
(Knowledge, Skills, and Abilities (KSA’s) are indicated for programs seeking accreditation in the Exercise Sciences (as per ACSM’s Guidelines for Exercise Testing and Prescription, 8th edition) via CAAHEP).

Upon completion of this course, the student will be able to:
1) Describe and explain the role of proper nutrient and caloric intake on exercise performance.

<table>
<thead>
<tr>
<th>KSA</th>
<th>Description</th>
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<tbody>
<tr>
<td>1.8.1</td>
<td>Knowledge of the role of carbohydrates, fats, and proteins as fuels for aerobic and anaerobic metabolism.</td>
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<tr>
<td>1.8.5</td>
<td>Knowledge of the importance of an adequate daily energy intake for healthy weight management.</td>
</tr>
<tr>
<td>1.8.6</td>
<td>Knowledge of the difference between fat-soluble and water-soluble vitamins.</td>
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</table>

2) Differentiate between the different energy systems and their functions.

<table>
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<tbody>
<tr>
<td>1.1.9</td>
<td>Ability to describe the systems for the production of energy.</td>
</tr>
<tr>
<td>1.1.10</td>
<td>Knowledge of the role of aerobic and anaerobic energy systems in the performance of various activities.</td>
</tr>
</tbody>
</table>
1.1.17 | Knowledge of the physiological adaptations that occur at rest and during submaximal and maximal exercise following chronic aerobic and anaerobic exercise training.

3) Employ various units of measure and methods of computing in the computation of work, power and energy.

<table>
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<tbody>
<tr>
<td>1.7.14</td>
<td>Knowledge of approximate METs for various sport, recreational, and work tasks.</td>
</tr>
<tr>
<td>1.7.36</td>
<td>Ability to convert between the U.S. and Metric systems for length/height (inches to centimeters), weight (pounds to kilograms) and speed (miles per hour to meters per minute).</td>
</tr>
<tr>
<td>1.7.37</td>
<td>Ability to convert between absolute (mL.min&lt;sup&gt;-1&lt;/sup&gt; or L.min&lt;sup&gt;-1&lt;/sup&gt;) and relative oxygen costs (mL.kg&lt;sup&gt;-1&lt;/sup&gt;.min&lt;sup&gt;-1&lt;/sup&gt;) and/or METs.</td>
</tr>
<tr>
<td>1.7.38</td>
<td>Ability to determine the energy cost for given exercise intensities during horizontal and graded walking and running stepping exercise, cycle ergometry, arm ergometry and stepping.</td>
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4) Describe and explain physiological changes during exercise recovery.

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<tr>
<td>1.1.16</td>
<td>Knowledge of the common theories of muscle fatigue and delayed onset muscle soreness (DOMS).</td>
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</table>

5) Describe and explain the basic structure and function of muscles and nerves.

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<tr>
<td>1.1.7</td>
<td>Knowledge of the stretch reflex and how it relates to flexibility.</td>
</tr>
<tr>
<td>1.1.14</td>
<td>Knowledge of the anatomical and physiological adaptations associated with strength training.</td>
</tr>
<tr>
<td>1.1.19</td>
<td>Knowledge of the structure and function of the skeletal muscle fiber</td>
</tr>
<tr>
<td>1.1.20</td>
<td>Knowledge of the characteristics of fast and slow twitch fibers.</td>
</tr>
<tr>
<td>1.1.21</td>
<td>Knowledge of the sliding filament theory of muscle contraction.</td>
</tr>
<tr>
<td>1.1.24</td>
<td>Knowledge of muscle fatigue as it relates to mode, intensity, duration, and the accumulative effects of exercise.</td>
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</table>

6) Demonstrate knowledge gained in the areas of pulmonary ventilation and mechanics, cardiovascular events, and gas exchange and transportation as a result of physical exercise.

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<tr>
<td>1.1.12</td>
<td>Ability to describe normal cardiorespiratory responses to static and dynamic exercise in terms of heart rate, stroke volume, cardiac output, blood pressure, and oxygen consumption.</td>
</tr>
<tr>
<td>1.1.18</td>
<td>Knowledge of the differences in cardiorespiratory response to acute graded exercise between conditioned and unconditioned individuals.</td>
</tr>
<tr>
<td>1.1.26</td>
<td>Knowledge of the response of the following variables to acute static and dynamic exercise: heart rate, stroke volume, cardiac output, pulmonary ventilation, tidal volume, respiratory rate, and arteriovenous oxygen difference.</td>
</tr>
<tr>
<td>1.1.27</td>
<td>Knowledge of blood pressure responses associated with acute exercise including change in body position</td>
</tr>
<tr>
<td>1.1.28</td>
<td>Knowledge of and ability to describe the implications of ventilatory threshold (anaerobic threshold) as it relates to exercise training and cardiorespiratory assessment.</td>
</tr>
<tr>
<td>1.1.29</td>
<td>Knowledge of and ability to describe the physiological adaptations of the pulmonary system that occur at rest and during submaximal and maximal exercise following chronic aerobic and anaerobic training.</td>
</tr>
<tr>
<td>1.1.30</td>
<td>Knowledge of how each of the following differs from the normal condition: dyspnea, hypoxia, and hyperventilation.</td>
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<tr>
<td>1.4.3</td>
<td>Knowledge of the basic properties of cardiac muscle and the normal pathways of conduction in the heart.</td>
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7) Explain and discuss the basic adaptation to “acute and chronic” bouts of exercise and how these affect the principles of exercise training and programming.

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<td>1.1.13</td>
<td>Knowledge of the heart rate, stroke volume, cardiac output, blood pressure, and oxygen consumption responses to exercise.</td>
</tr>
<tr>
<td>1.1.15</td>
<td>Knowledge of the physiological principles related to warm-up and cool-down.</td>
</tr>
</tbody>
</table>
1.1.27 Knowledge of blood pressure responses associated with acute exercise, including changes in body position.

1.1.31 Knowledge of how the principles of specificity and progressive overload relate to the components of exercise programming.

1.1.32 Knowledge of the concept of detraining or reversibility of conditioning and its implications in exercise programs.

1.1.33 Knowledge of the physical and psychological signs of overreaching/overtreining and to provide recommendations for these problems.

1.7.10 Knowledge of the recommended intensity, duration, frequency and type of physical activity necessary for development of cardiorespiratory fitness in an apparently healthy population.

1.7.18 Knowledge of the advantages and disadvantages of implementation of interval, continuous, and circuit training programs.

1.7.27 Ability to differentiate between the amount of physical activity required for health benefits and the amount of exercise required for fitness development.

### Instructional Methods and Techniques

1. Lecture/
2. Independent study/labs
3. Class and small group discussion/exercises/labs
4. Audio/visual support
5. Other as needed

### Method of Evaluation

A = 90% and above; B = 80% and above; C = 70% and above; D = 60% and above; F = below 60%

- A final grade of “C” or better is required of all majors in KHS.

### Course Requirements

The final grade will be based upon total points possible including all of the areas listed below:

**Written Exams**

The student will participate in 5 exams, which will address the course competencies. **Each exam is worth approximately 100 points & the comprehensive final will be 150 points.** There are NO unscheduled makeup exams.

1. Material on these exams will not necessarily be covered in class, but may be taken from the assigned readings; it is each student’s responsibility to read the text and ask questions on the material that is not understood.

2. Exams must be taken on the scheduled date unless prior arrangements are made with the instructor. Late tests should occur within 1 class period of scheduled exam.

3. Class members who schedule their exam after the original exam date will automatically receive a **20-point deduction on the exam.**

4. Students who participate in university-sanctioned obligations, such as choir, athletics, etc., must **notify the instructor by the second day of class** to review any conflicts with exams or assignments.

### Attendance and Class Participation

Out of respect for your time, class will begin promptly at 1:00 p.m. and will finish at 1:50 p.m.
1. Each student is expected to be prepared for the class by reading assignments prior to class. Students are responsible for all assigned readings, class lectures, discussions, films, etc. Therefore, it is the student’s responsibility to obtain copies of assignments, handouts, and notes if absent from class.

2. Class Discussion Points—Read the daily assignment and take notes prior to coming to class. Class time will be used to clarify, highlight, and discuss key points. It will not be spent covering material for the first time. Most days (excluding test days) you will be awarded “discussion” points based on the reading for that class period: 3 pts. for an active and informed contribution; 2 pts. for an active & uniformed contribution; 1 pt. for minimal participation; and 0 pts. for no participation. If a student is absent or tardy, 0 points will be awarded. These points are subjective and awarded after class each day discussion occurs.

   - Bring your texts to class daily. You will need your notes in class (to make additions to them); however, you will not refer to your text during discussion.
   - Obviously, “not being prepared” for class discussion and “not actively participating” will have a negative impact on your final grade.

3. You will be counted absent if you are not in class. Reasons for being absent include: illness, being tired, blowing off class, mental health day, oversleeping, and any other reasons not listed here. Absences will impact your “total points” which determine your final grade. If you do not miss any class sessions, you will receive 5 points added to you total points; 1 absence will add 3 points to your total points; 2 absences will result in 1 point being added to your total points; and with 3 absences, no points will be added or taken from your total points. However, there will be a 5 point deduction from the overall total points accumulated for the class for each and every absence after three (3).

   Absences will be counted from the first day of class, not the first day of attendance by the student. It is up to the student to inform the professor if he/she comes in late to class after roll is taken. A roll sheet will be passed out each day: no signature = absent. And, it is the student’s responsibility to find out about any missed work and submit it on time. Students are strongly encouraged to discuss absences with the professor.

4. Class attendance is expected of each person enrolled in the class and each student is expected to arrive on time and remain for the entire class period. Two tardies and/or early departures will equal one absence. Please be respectful of class time, your instructor, and your fellow classmates.

5. All assignments are due at the beginning of the class period. Any assignment not turned in after this time will be considered late. Late assignments will be accepted within one class day of their due date. An assignment turned in at this time will receive a maximum 75% credit. No assignments will be accepted after this time unless prior arrangements are made.

6. Texting or other unauthorized/inappropriate use of electronic technology during class will result in a 5 pt. deduction for each infraction from total points possible for the class.
7. Discussion, quizzes and in class assignments completed when you are not in class may not be made up or substituted for other work. Those points will be lost.

**General Assignments**
1. Questions and assignments (group or individual)
2. Quizzes
3. Other as assigned

**General Notes**
- Written reports will be typewritten using Times New Roman 12 pt font, double-spaced, with 1-inch margins all around. Justification should be set to “off” or “left margin only” (right margin will be uneven). Pages will be numbered consecutively. APA 6th Edition format will be the standard reference. Assignments will be due at the beginning of the class period on the date scheduled and multiple pages need to be stapled.
- Students interested in strengthening personal writing skills may contact the Writing Center at “Tutoring Central” in West Hall, 974-2487.
- Academic dishonesty is a concern that will be dealt with in compliance with the University of Central Oklahoma guidelines. Plagiarism and cheating will NOT be tolerated. In this course students are encouraged to collaborate, but the notion of using the same answer for several people is not accepted. Work that has obviously been plagiarized is easily determinable. Students who are detected plagiarizing will receive a zero (0) for the assignment with no opportunity to make it up. A second such occurrence will result in receiving an automatic “F” for the course and the Department Chair will be notified of the event.
- Behavior that is distracting to your colleagues, such as talking use of cell phones, inappropriate dress, etc… is prohibited. As adults we are expected to take care of any “business” before class, it is unacceptable to leave or disrupt class without permission. Students that display disruptive behavior will be asked to leave class. Repeated offenses will result in an expulsion from the course.
- Your level of success in this class is very much left up to YOU! I will do everything I can to assist in your progress and success----but the bottom line is that you must take full responsibility for yourself and your grade.

**Fatal Error Policy:** All written assignments must meet minimal presentation standards to be acceptable. These standards address spelling, punctuation, format and basic grammar. The term Fatal Errors refers to technical American English errors of form. Specifically, they include the following:
- Each different word misspelled;
- Each sentence fragment;
- Each run-on sentence or comma splice;
- Each mistake in capitalization;
- Each serious error in punctuation that obscures meaning;
- Each error in verb tense or subject/verb agreement;
- Lack of conformity with assignment format; and,
h) each improper citation, or lack of citation, where one is needed.

Papers with more than three (3) fatal errors marked by an instructor on any one page, or more than 12 non-repeated errors for the entire document will be returned to the student and subject to 20% off the grade immediately and subject to 10% off for each class day until the paper is returned corrected. The paper may be resubmitted one time.

Final course papers (where there is no time for a resubmission) will be docked one percent of the grade for each error including one percent off for each repeated error.

**Ethical conduct** is expected in this course; academic dishonesty will not be tolerated. Academic dishonesty includes, but is not limited to: plagiarizing; cheating on exams or in the preparation of academic work; copying from tests, reports, etc.; collaborating with others without prior authorization; reuse of work in more than one class without informing the instructor; possessing contents of an un-administered examination; and using materials during a test not authorized by the instructor. While collaboration with cohorts in study groups is encouraged, each student is responsible for his or her own work. Students may not, under any circumstances, turn in work that has been prepared by someone else.

Disciplinary action (as outlined by the Code of Student Conduct) will result in one of the following at the instructor’s discretion:

- A substitute assignment or examination
- A reduced grade for the assignment, examination, or course
- A grade of zero of F for the assignment, examination, or course
- A grade of F for the course

*NOTE: UCO subscribes to the Turnitin.com plagiarism prevention service. Students agree that by taking this course, all required assignments may be subject to submission for textual similarity review to Turnitin.com for the detection of plagiarism. All submitted assignments will be included as source documents in the Turnitin.com restricted access reference database for the purpose of detecting plagiarism of such assignments. Use of the Turnitin.com service is subject to the Terms and Conditions of Use posted on the Turnitin.com website. Turnitin.com is just one of various plagiarism prevention tools and methods which may be utilized by your faculty instructor during the term of the semester. In the UCO Student Handbook, there is a process for contesting any plagiarism allegations against you.*

**Special Accommodations:** The University of Central Oklahoma complies with Section 504 of the Rehabilitation Act of 1973 and the American with Disabilities Act of 1990. Students with disabilities who need special accommodations must make their requests by contacting Disability Support Services, at (405) 974-2516. The DSS Office is located in the Nigh University Center, Room 309. Students should also notify the instructor of special accommodation needs by the end of the first week of class.

“If an emergency occurs that prevents the administration of a final examination, the student’s final course grade will be calculated based on the work in the course completed to that point in time and the faculty member’s considered judgment. Final exams will not be rescheduled, and a grade of “I” will not be given as a result of the missed exam.” UCO Weather Line: 974-2002

Please see the Academic Affairs’ “Student Information Sheet and Syllabus Attachment” at [http://www.uco.edu/academic-affairs/files/aa-forms/faculty/StudentInfoSheet.pdf](http://www.uco.edu/academic-affairs/files/aa-forms/faculty/StudentInfoSheet.pdf)
Exercise Physiology – *Tentative Schedule

Week 1: Syllabus and Intro to Chpt. 2
Chpt. 2 – p. 34 - 43
Chpt. 2 – p. 44 - 52

Week 2: Chpt. 2 – p. 53 - 65
Chpt 2 – p. 66 - 77
Chpt. 5 – Terminology

Week 3: Chpt. 5 – p. 152 - 162
Chpt. 5 – p. 163 – 174 / Anaerobic Energy Metabolism
Chpt. 5 – p. 175 – 182 / Aerobic Energy Metabolism

Week 4: Chpt. 6 – p. 186 - 192
Chpt. 6 – p. 193 - 200

Test #1 – Chapters 2, 5 & 6

Week 5: Chpt. 7 – p. 204 - 209
Chpt. 7 – p. 210 - 215
Chpt. 7 – p. 216 - 222

Week 6: Chpt. 7 – p. 223 - 229
Chpt. 7 – p. 229 - 233
Chpt. 8 – p. 238 - 241

Week 7: Chpt. 8 – p. 242 - 246
Chpt. 8 – p. 246 - 249
Chpt. 8 – p. 250 - 253

Week 8: Chpt. 8 – p. 253 - 258

Test #2 – Chapters 7 & 8

Week 9: Chpt. 9 – p. 266 - 271
Chpt. 9 – p. 271 - 277
Chpt. 9 – p. 278 - 284
Chpt. 9 – p. 284 - 290

Week 10: Chpt. 9 – p. 291 – 297
Chpt. 10 – p. 302 – 307
Chpt. 10 – p. 308 – 313

Week 11: Chpt. 10 – p. 313 – 319
Chpt. 10 – p. 319 – 325
Chpt. 10 – p. 325 – 333

Week 12: Test # 3 – Chapters 9 & 10
Chpt. 11 – p. 338 – 347
Chpt. 11 – p. 347 – 357

Week 13: Chpt. 11 – p. 358 – 364
Chpt. 11 – p. 364 - 373
Chpt. 13 – p. 410 - 419

Week 14: Chpt. 13 – p. 420 – 428
Chpt. 13 – p. 428 - 438

Test # 4 – Chapters 11 & 13

Week 15: Finish content and review for Comprehensive Final

*The above schedule is tentative and can be changed at the discretion of the Instructor.

COMPREHENSIVE FINAL EXAM

D. Fent -- 2012