6. Differentiate between the procedures to estimate the energy expenditure using direct and indirect calorimetry.

5. Diagram the hormonal responses to exercise and their effect on metabolism.

4. Explain the utilization of muscle glycogen during endurance training and performance and the subsequent need for dietary carbohydrate intake.

3. List the food sources and how, as well as how much energy is derived from them.

2. Recognize the relationship between exercise intensity/duration and the bioenergetic pathways that are most responsible for production of ATP during various types of exercise.

1. Summarize the biochemical pathways involved in anaerobic and aerobic ATP production, the regulation of these metabolic pathways, and the interaction between aerobic and anaerobic ATP production during exercise.

To demonstrate satisfactory competence at the completion of the course, the student will:

1. Summarize the biochemical pathways involved in anaerobic and aerobic ATP production, the regulation of these metabolic pathways, and the interaction between aerobic and anaerobic ATP production during exercise.

2. Recognize the relationship between exercise intensity/duration and the bioenergetic pathways that are most responsible for production of ATP during various types of exercise.

3. List the food sources and how, as well as how much energy is derived from them.

4. Explain the utilization of muscle glycogen during endurance training and performance and the subsequent need for dietary carbohydrate intake.

5. Diagram the hormonal responses to exercise and their effect on metabolism.

6. Differentiate between the procedures to estimate the energy expenditure using direct and indirect calorimetry.
7. Discuss the relationship between skeletal muscle fiber types and performance.
8. Design an experiment that determines the factors that regulate the amount of force exerted during muscular contraction.
9. Illustrate the cardiac cycle and the associated electrical activity recorded via the electrocardiogram.
10. Discuss the pattern of redistribution of blood flow during exercise.
11. Identify the factors that regulate local blood flow during exercise.
12. List and discuss those factors responsible for regulation of stroke volume during exercise.
13. Discuss the regulation of cardiac output during exercise.
14. List the cardiovascular adaptations to training and discuss them in the context of preventive medicine.
15. Discuss the importance of matching blood flow to alveolar ventilation in the lung.
16. Describe the ventilatory response to constant load, steady state and incremental exercise.
17. Explain the role of respiration in the regulation of acid-base status during exercise.
18. Explain the basic principles of training: overload and specificity.
19. Predict the typical change in VO\textsubscript{2} max with endurance training programs.
20. Describe the effects of exercise training on major risk factors associated with coronary heart disease.
21. Discuss the changes in body composition when weight is lost by diet alone versus diet plus exercise.
22. Contrast the factors limiting performance in various types of activities.
23. Set up guidelines for coaches to follow regarding practice that takes into account the effects that changes in the environment can have on physiological performance as well as the physiological adaptations that accompany training with special emphasis on temperature regulation.

Course Content/Exam Schedule:

**PART I: EXERCISING MUSCLE**
An Introduction to Exercise and Sport Physiology
I. Structure and Function of Exercising Muscle (Chapter 1)
II. Neural Control of Exercising Muscle (Chapter 3)

**EXAM #1:** (Chapters 1 & 3) 100 points; Monday, January 30, 2017

III. Fuel for Exercise: Bioenergetics and Muscle Metabolism (Chapter 2)
IV. Energy Expenditure and Fatigue (Chapter 5)

**EXAM # 2:** (Chapters 2 & 5) 100 points; Wednesday, March 1, 2017

**PART II: CARDIOVASCULAR AND RESPIRATORY FUNCTION**
V. The Cardiovascular System and Its Control (Chapter 6)
VI. The Respiratory System and Its Regulation (Chapter 7)
VII. Cardiorespiratory Responses to Acute Exercise (Chapter 8)

**EXAM # 3:** (Chapters 6, 7, & 8) 100 points; Monday, April 10, 2017

**Part III: EXERCISE TRAINING**
VIII. Principles of Exercise Training (Chapter 9)
IX. Adaptations to Resistance Training (Chapter 10)
X. Adaptations to Aerobic and Anaerobic Training (Chapter 11)

**FINAL EXAM (EXAM # 5):** (Chapters 9, 10, 11 AND 2 or 3 questions from Chaps 1,2,3,5) 100 points; (Friday, May 5; 8-10)

**PART IV: ENVIRONMENTAL INFLUENCES ON PERFORMANCE**
XI. Exercise in Hot and Cold Environments: Thermoregulation (Chapter 12)
XII. Exercise at Altitude (Chapter 13)

**Part V: OPTIMIZING PERFORMANCE IN SPORT**
XIII. Training for Sport (Chapter 14)

**EXAM # 4 TAKE HOME EXAM: 25 Points** (Chapters 12, 13 & 14) Due, Monday, April 24, 2017 - start of class

**Course Grading:**

**A.**

1. Chapters 1 & 3: 100 points
2. Chapters 2 & 5: 100 points
3. Chapters 6, 7 & 8: 100 points
5. Final: Chapters 9, 10 & 11: 100 points

*must attend the scheduled exam date; No Make-Ups

Your total points on an exam is calculated using: (your score/total # of questions) X 100, or, in the case of the open book exam, (your score/total # of questions) X 25

The ‘quizzes’ on Blackboard are ONLY used in an effort to have you peruse the material in the text. These ‘points’ are NOT, in any way, factored into your course grade.

**B.**

Grading Scale (total points = 425)
1. **A** = 382 - 425 points
2. **B** = 340 - 381 points
3. **C** = 297 - 339 points
4. **D** = 255 - 296 points
5. **F** = <255 points
‘Extra Credit’: For each of the four 100 point exams you have the opportunity to earn 5 extra points. To do so, you must obtain a peer-reviewed publication that is related to the current focus of study and is of interest to you. After reading the article, you will write and submit a brief summary of the article (limit ½ page) and how it applies to the current material and how you benefitted from it (limit ½ page). The source of the article MUST be from http://maag.guides.ysu.edu/HPES3710/HPES1595Journals. The pdf of the article AND your 1-page critique (Font 12point Calibri, all margins 0.5 inch) will be submitted to me as 2 attachments via BLACKBOARD ASSIGNMENTS no later than the dates listed below. NO EMAIL! Your one-page review should be named as follows: LAST NAME - FIRST- Chaps _-_.docx. For example: BOSSO-Frank-Chap 1+3.docx. The pdf of the article should be named: Author's last name-Title of Article. Any deviation for these instructions will result in 0 POINTS for the review. So in total, these reviews are worth: 4 X 5 = 20 points. Also, you may be asked to provide an overview of your review to the class.

<table>
<thead>
<tr>
<th>Content</th>
<th>Last day to submit review via Blackboard ASSIGNMENTS</th>
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<tbody>
<tr>
<td>Structure and Function of Exercising Muscle (Chapter 1)</td>
<td>January 23</td>
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<tr>
<td>Neural Control of Exercising Muscle (Chapter 3)</td>
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<tr>
<td>Fuel for Exercise: Bioenergetics and Muscle Metabolism (Chapter 2)</td>
<td>February 20</td>
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<tr>
<td>Energy Expenditure and Fatigue (Chapter 5)</td>
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<td>The Cardiovascular System and Its Control (Chapter 6)</td>
<td>March 27</td>
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<td>The Respiratory System and Its Regulation (Chapter 7)</td>
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<td>Cardiorespiratory Responses to Acute Exercise (Chapter 8)</td>
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<tr>
<td>Principles of Exercise Training (Chapter 9)</td>
<td>April 24</td>
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<tr>
<td>Adaptations to Resistance Training (Chapter 10)</td>
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<tr>
<td>Adaptations to Aerobic and Anaerobic Training (Chapter 11)</td>
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Last day to withdraw and receive a grade of ‘W’ is March 23, 2017.

COURSE/UNIVERSITY POLICIES:

Center for Student Progress:
The Marion G. Resch Center for Student Progress is a resource on Campus established to help students successfully complete their university experience. Please phone (330) 941-3538 or visit the Center for assistance in tutoring or for individualized assistance with academic success. The main Center is located in Kilcawley West below the bookstore. CSP Disability Services is located at 36 West Wood Street.

Americans with Disabilities Act:
Youngstown State University is committed to providing reasonable accommodations for all persons with disabilities. This syllabus is available in alternative format upon request. In accordance with University procedures, if you have a documented disability and require accommodations to obtain equal access in this course; please contact me privately to discuss your specific needs. You must be registered with the Center for Student Progress Disability Services, located at 36 West Wood Street, and provide a letter of accommodation to coordinate reasonable accommodations. You can reach CSP Disability Services at 330-941-1372.

Youngstown State University does not discriminate on the basis of race, color, national origin, sex, sexual orientation, gender identity and/or expression, disability, age, religion or veteran/military status in its programs or activities. Please visit www.ysu.edu/ada-accessibility for contact information for persons designated to handle questions about this policy.

Incomplete:
In accordance with University policy, a grade of incomplete (I) may be issued only if you request the incomplete; you have been doing satisfactory work in the course; the reason for the incomplete is beyond your control; and all requirements of the course have not been completed by the time the grades were submitted. If an incomplete is granted, all work must be completed by the University established deadline for the next semester. If not, the 'I' automatically becomes an 'F'. Please note that I will only grant Incompletes based on University policy. This means Incompletes will NOT be granted if halfway through the semester you realize you are performing poorly and can no longer keep pace with the course.

Academic Integrity:
Plagiarism, especially for this online course, for any assignment, cheating of any kind, or not contributing to your group projects may result in a grade of "F" on the assignment and may result in an "F" for the course. Additional actions are detailed in the "Academic Honesty" section of the Youngstown State University Undergraduate Bulletin (http://ysu-preview.courseleaf.com/).