

M: Course Objectives / Learning Outcomes

Upon completion of this course, the student will be able to:

1. Describe the role of biodynamics as a basis for understanding and improving human athletic performance
2. Explain the biodynamics of athletic activity:
 - 2.1 structure
 - 2.2 function
 - 2.3 human motion
 - 2.4 energy production
 - 2.5 body support systems
3. Describe the biodynamic responses of the human body to physical activity

N: Course Content:1. The Nature of Biodynamics as a Field of Study

The student will:

- 1.1 Examine the comprehensive nature of biodynamics as a means of studying human athletic performance
- 1.2 Describe the differences between biodynamics and other similar and well-used terminologies
- 1.3 Examine the different means of sports analysis and skill remediation in current use

2. Biodynamics Aspects of Athletic Performance

2.1 Describe and demonstrate the application of a practical knowledge of human structural aspects:

- 2.1.1 levers of skeletal system
- 2.1.2 muscle-bone attachments
- 2.1.3 joint structure
- 2.1.4 body size and proportions

2.2 Describe the functional aspects of athletic performance:

- 2.2.1 neural control
 - 2.2.1.1 voluntary
 - 2.2.1.2 reflex
 - 2.2.1.3 kinesthetic
- 2.2.2 muscle contraction
 - 2.2.2.1 energy conversion
 - 2.2.2.2 tension development

2.3 Explain the movement aspects of human athletic performance:

- 2.3.1 the laws of motion
- 2.3.2 mechanics of motion
 - 2.3.2.1 non-locomotor
 - 2.3.2.2 locomotor

2.4 Describe energy transfer in the performance of athletics:

- 2.4.1 fuels used in physical performance
- 2.4.2 basic molecular processes
 - 2.4.2.1 aerobic energy production
 - 2.4.2.2 anaerobic energy production

2.5 Describe the contributions of major body support systems to athletic performance:

- 2.5.1 nutritional
- 2.5.2 oxygen delivery to the cells
- 2.5.3 removal of metabolic waste

3. Adaptive Biodynamic Responses to Athletic Performance

3.1 Explain acute homeostatic bodily responses:

- 3.1.1 structural aspects of athletic performance
 - 3.1.1.1 physical stress associated with athletic activity
 - 3.1.1.2 prevention of overuse injuries
 - 3.1.1.3 injuries from overuse
- 3.1.2 functional aspects of athletic performance
 - 3.1.2.1 responses to increased energy demands
 - 3.1.2.2 responses to increased waste production
 - 3.1.2.3 fatigue as failure to maintain homeostasis

3.2 Describe chronic adaptive responses to athletic performance:

- 3.2.1 changes in performance ability
- 3.2.2 structural changes
- 3.2.3 function changes

<p>O: Methods of Instruction</p> <p>Lecture</p> <p>Small Group Practice</p> <p>Discussion</p> <p>Audiovisual Presentation</p> <p>Use of Models and Charts</p> <p>Collection and Assessment of Performance Data</p>						
<p>P: Textbooks and Materials to be Purchased by Students</p> <ol style="list-style-type: none"> 1. Tortora, G.J. <u>Introduction to the Human Body: the Essentials of Anatomy and Physiology</u>, (5th ed.) New York: Wiley Publishers, 2001 (or Biol 1109/1209 current textbook) 2. Hall, S.J., <u>Basic Biomechanics</u>, (3rd ed.) St. Louis: Mosby Year Book Publishers, 1999 (or SPSC 1263 current textbook). 3. De Vries, H.A. and Housh, T.J., <u>Physiology of Exercise for Physical Education, Athletics and Exercise Science</u>, Dubuque, Iowa: Brown and Benchmark Publishers, 2000 (or SPSC 2363 current textbook). 4. Corbin, C.B. and Lindsey, R., <u>Concepts of Physical Fitness</u> (10th ed.) Dubuque, Iowa: Brown and Benchmark Publishers, 2000 (or SPSC1103 current textbook). 						
<p>Q: Means of Assessment</p> <table style="margin-left: 40px;"> <tr> <td>Examinations (3)</td> <td style="text-align: right;">70%</td> </tr> <tr> <td>Projects (2)</td> <td style="text-align: right;"><u>30%</u></td> </tr> <tr> <td style="text-align: right;">TOTAL</td> <td style="text-align: right;">100%</td> </tr> </table>	Examinations (3)	70%	Projects (2)	<u>30%</u>	TOTAL	100%
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<p>R: Prior Learning Assessment and Recognition: specify whether course is open for PLAR</p>						

 Course Designer(s)

 Education Council / Curriculum Committee Representative

 Dean / Director

 Registrar