



COURSE SYLLABUS

SOUTHEAST MISSOURI STATE UNIVERSITY

Department of Physical Education

Course No. PE 341

Course Title: Physiology of Conditioning

Revision: Fall 2001



“The Teacher as Professional Educator”

COURSE SYLLABUS

Department Approved 11/13/2001

College Council Approved January 17, 2002

I. Catalog Description and Credit Hours of Course:

Development of conditioning programs to meet athletic and health needs based upon physiological responses to acute and chronic exercise. (3)

II. Prerequisite(s): BS 113 and AT 140 or concurrent enrollment

III. Objectives of the Course:

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

- A. Describe energy system utilization during rest, exercise and recovery from exercise. (1.5, 1.7)
- B. Understand the acute and chronic responses of the human body to anaerobic and aerobic activity with special emphasis given to the cardiovascular, respiratory, nervous and muscular systems. (1.7)
- C. Recognize varying physiological responses to exercise relative to gender, age and environment conditions. (1.7)
- D. Generate appropriate tests to evaluate athletic and health fitness. (1.5, 1.7, 2.1, 5.4, 7.1)
- E. Develop conditioning programs for enhancement of athletic performance and individual health status. (1.5, 8.2)

IV. Course Outline/Learning Experiences:

Hours

A. Lecture Topics	
1. Muscle structure and function	3
2. Energy source for aerobic and anaerobic exercise	4
3. Pulmonary ventilation	1
4. Gas exchange and transportation	3
5. The cardiovascular system	3
6. Recovery from exercise	1
7. Physiological adaptation to acute and chronic exercise	2
8. Nervous system and exercise	1
9. Neuromuscular adaptations to resistance training	2
10. Exercise considerations relative to gender and age	3
11. Environmental influences on physical performance	2
12. Optimizing performance through nutritional and ergogenic aids	3
13. Exercise programs for enhancement of sports performance	2
14. Body composition and flexibility considerations	3
15. Training programs for health and fitness	2
16. Assessment of fitness for health and sport	3

B.	Laboratory Experiences – Scheduled laboratory sessions*	
	These sessions are designed to introduce certain topics.	
	Completion of these assignments are to be undertaken outside of class time.	
1.	Assessment of body composition -- skinfold measurement	1
2.	Evaluation of flexibility - use of the inclinometer, sit and reach test	1
3.	Resting and exercise heart rate and blood pressure measurement	1
4.	Tests of aerobic fitness (McArdle bench step test, Astrand and Rhythmic bicycle ergometer test)	2
5.	Tests of muscular power & anaerobic fitness -- 15 & 30 second Wingate test and continuous jumping test	<u>2</u>
	TOTAL LABORATORY HOURS	<u>7</u>
	TOTAL COMBINED COURSE HOURS	<u>45</u>

- C. Laboratory Experiences – Outside of class assignments
- Outside of class assignments include:
1. Completion of labs not finished during class time
 2. Anthropometrics and Body Composition
 - Height & weight tables
 - Apple/pear equation
 - Body mass index
 - Circumferences method
 - Bioelectrical impedance
 - Near-infrared spectrophotometry
 3. Muscular Strength and Muscular Endurance
 - 1RM
 - Prediction of 1RM
 - Repetitions @ percentage of 1RM
 - The sit-up test of muscular endurance
 4. Heart Rate and Blood Pressure
 - Resting and exercise heart rate
 - Karvonen method to determine exercise heart rate
 - Exercise heart rate – use of the Polar Watch
 5. Tests of Aerobic Fitness
 - Cooper's twelve-minute run
 - The multi-stage shuttle run
 6. Muscular Power
 - Lewis jump and reach test
 7. Caloric Expenditure
 - Estimation of daily caloric expenditure

V. Textbook and Other Required Materials:

Required:

Wilmore, Ph.D., and Costill, David L. Ph.D., (1999) *Physiology of Sport and Exercise*, Champaign, IL: Human Kinetics.
 Maud, P. J., (2001) *Laboratory Manual for Physiology of Conditioning*.

Other References:

Gore, C. J., (2000). Physiological Tests for Elite Athletes/Australian Sports Commission., Champaign, IL: Human Kinetics

Guyton, A. C. (2000). Textbook of Medical Physiology, 10th edition Philadelphia: Saunders

Janssen, P., (2001). Lactate Threshold Training, Champaign, IL: Human Kinetics

Kreider, R. B., A. C. Fry, and M. L. O'Toole, (1998). Overtraining in Sport, Champaign, IL: Human Kinetics

Maud, P. J. and C. Foster, (1995). Physiological Assessment of Human Fitness, Champaign, IL: Human Kinetics

McArdle, W. D., F. I. Katch, and V. L. Katch, (1996). Exercise Physiology Energy, Nutrition, and Human Performance, 4th edition, Lea and Febiger

Robergs, R. A., and S. O. Roberts, (1997). Exercise Physiology, Exercise, Performance, and Clinical Applications, Mosby

Rowland, T. W., (1996). Developmental Exercise Physiology, Champaign, IL: Human Kinetics

Sharkey, B. J., (1997). Fitness and Health, 4th edition, Champaign, IL: Human Kinetics

Skinner, J. S., (1996). The Wingate Anaerobic Test, Champaign, IL: Human Kinetics

VI. **Basis for Student Evaluation:***

A.	Four scheduled quizzes three of which will count @ 10% each	30%
B.	Mid term examination	20%
C.	Final examination	20%
D.	Paper-topic to be determined after consultation with the instructor:**	10%
E.	Laboratory projects – completions of both in-class and outside of class assignments	<u>20%</u>
		<u>100%</u>

* Due to the lack of an exercise science laboratory, experiences in this area are of necessity somewhat limited. This is the prime reason for having a large outside-of-class laboratory experience requirement.

*Complete a term paper. The following are term paper requirements:

1. The paper topic is to be selected from a list supplied by the instructor. If a student has interests in a specific topic closely related to the course material, but not listed, he may request substitution. This will be allowed only at the discretion of the instructor.
2. Minimum number of references – 5. These must come from professional journals as opposed to texts. Popular magazines (Men's Journal etc.) cannot be used. Internet sources may be used on a limited basis (a maximum of two) but must be pre-approved by the instructor. If you have any doubt about the acceptability of a specific source, discuss this with your instructor.
3. Style - either use APA style or another recognized one (Must either indicate style name or quote a journal in which it is used.)
4. Length - Three to five pages – double-spaced
5. Spelling and grammatical error will affect grade
6. Plagiarism and academic dishonesty will not be tolerated. See page 17 of the 2000-2001 University Bulletin for further details.

**The University policy is to require attendance at all classes and to complete all assignments. Only university-sanctioned activity requires the instructor to provide an opportunity for assignment make-up (see page 16 of the University Bulletin, 2000-2001 edition). Should a university-sanctioned event or a health professional certified illness prevent attendance at a laboratory session, the instructor will provide an opportunity to make up the missed experience. Otherwise, missed laboratory sessions will result in reduction of grade for the laboratory project reports. No make-up will be allowed for quizzes. In the

event that one or two quizzes are missed, the percent grade for the quiz requirement will be dependant upon the other two quiz grades.