



Broward Community College

Course Outline

STATUS: A

COMMON COURSE NUMBER: PET 1303

COURSE TITLE: Foundations of Exercise Science

CREDIT HOURS: 3

CONTACT HOURS BREAKDOWN:

Lecture/Discussion 48

Lab

Other

Contact Hours/Week 3

CATALOG COURSE DESCRIPTION:

Prerequisite: None

Corequisite: None

This course is designed to provide a foundational knowledge base which is common to all the different areas of fitness leadership. This didactic instruction lays the groundwork required by the fitness professional in order to be analytical in their approach to safe and effective exercise programming for the public. Course content is heavy in the areas of anatomy & physiology as well as kinesiology, the science of human movement.

General Education Requirements - Associate of Arts Degree, meets Area(s):
 General Education Requirements - Associate in Science Degree, meets Area(s):

UNIT TITLES:

1. Health & Fitness in Perspective
2. Philosophy & Standards
3. Anatomy & Physiology
4. Kinesiology
5. Cardiovascular Training
6. Muscular Training
7. Flexibility Training
8. Exercise Prescription
9. Injury Prevention & Emergency Procedures

I. Course Overview:

Upon successful completion of this course, the students should be able to demonstrate a working knowledge of health and fitness which will enable them to apply these principles to their own behaviors thereby achieving a higher quality of life. Additionally, they will have achieved a knowledge base of exercise science upon which they can build as they pursue specialty courses in the fields of recreation and/or fitness instruction.

II. Units:

Unit 1. Health & Fitness in Perspective

General Outcome:

- 1.0 The students should be able to discuss health and fitness concerns that affect morbidity, mortality and the overall quality of life within the United States as well as other industrialized nations.

Specific Learning Outcomes:

Upon successful completion of this unit, the students should be able to:

- 1.1 Recognize the difference between infectious diseases and lifestyle related concerns that plague this country.
- 1.2 Differentiate between cardiovascular risk factors that are lifestyle related versus those over which we have only partial control and those over which we have no control.
- 1.3 Understand the etiology of coronary artery disease, its implications and techniques to minimize damaging effects.
- 1.4 Develop familiarity with musculoskeletal problems relating to the sedentary lifestyle.
- 1.5 Distinguish the difference between elements of physical fitness and elements of physical performance.
- 1.6 Articulate the basic benefits of aerobic exercise, flexibility, muscular strength and endurance and the maintenance of healthy body fat levels.

Unit 2. Philosophy & Standards

General Outcome:

2.0 The students should be able to discuss the philosophical rationale for good health behavior as well as appropriate standards for fitness instructor personnel to ensure safe and effective service to the general public.

Specific Learning Outcomes:

Upon successful completion of this unit, the students should be able to:

2.1 Motivate individuals regarding their social responsibility to achieve and maintain adequate standards of health and fitness in order to avoid becoming a social liability to family, business and government.

2.2 Recognize specific knowledge, skills and abilities that are essential for the education, screening, evaluating, training and supervision of fitness clients.

Unit 3. Anatomy & Physiology

General Outcome:

- 3.0 The students should be able to demonstrate a working knowledge of the structure and function of those human systems which are most dramatically affected by the stress of exercise. Through understanding physiological changes of exercise, students will be able to control environmental variables to ensure that individuals are not overstressed to the point of harm.

Specific Learning Outcomes:

Upon successful completion of this unit, the students should be able to:

- 3.1 Understand the hierarchy of anatomical structures within the human body and how they interrelate.
- 3.2 Recognize normal physiological adaptations of the integumentary, skeletal, pulmonary, circulatory, digestive, nervous, muscular, endocrine, lymphatic and urinary (not reproductive) systems to exercise as well as abnormal responses to excessive stress.

Unit 4. Kinesiology

General Outcome:

- 4.0 The students should be able to demonstrate a working knowledge of major muscle groups and their function during exercise as well as injury concerns relating to inappropriate muscular activities.

Specific Learning Outcomes:

Upon successful completion of this unit, the students should be able to:

- 4.1 Analyze various activities in light of their range of motion and resistance's to determine appropriate muscle usage for task accomplishment.
- 4.2 Understand individual muscular activity as well as combined muscular activity required to create necessary skeletal movement during everyday and exercise movements.
- 4.3 Understand the classes of levers found within the human body, various muscular roles, types of muscular contraction, and the planes of movement used in joint motion terminology.
- 4.4 Understand joint motion terminology as used by allied health professionals and how to interpret prescriptive directives by such personnel.

Unit 5. Cardiovascular Training

General Outcome:

- 5.0 The students should be able to understand the various types of aerobic activities and the components of aerobic training which lead to increased cardiovascular strength or oxygen consumption.

Specific Learning Outcomes:

Upon successful completion of this unit, the students should be able to:

- 5.1 Identify the appropriate stimulus of exercise and the heodynamics that enable aerobic conditioning.
- 5.2 Understand the concept of aerobic power and the different means by which energy consumption can be measured.
- 5.3 Understand the essential elements of control during aerobic exercise and the guidelines for safe, progressive programming.
- 5.4 Understand and apply various monitoring techniques to control the intensity of exercise.
- 5.5 Understand the rationale and guidelines for aerobic exercise training.
- 5.6 Identify the differences between continuous and discontinuous aerobic activities and the target populations to which they apply.
- 5.7 Understand and articulate important safety concerns relating to the stages of exercise programming.
- 5.8 Identify the signs and symptoms that reflect overtraining.

Unit 6. Muscular Training

General Outcome:

6.0 The students should be able to understand the objectives and techniques for improving both muscular strength as well as muscular endurance.

Specific Learning Outcomes:

Upon successful completion of this unit, the students should be able to:

- 6.1 Identify the three types of muscular contractions as well as the various methods by which the muscular system can be stimulated.
- 6.2 Understand and know how to implement workout routines and to manipulate training variables in order to develop either muscular strength or endurance.
- 6.3 Understand advantages and disadvantages of working with free weights versus resistive exercise machines as well as the advantages and limitations of calisthenic type exercises.
- 6.4 Identify serious safety concerns that can lead to injuries during resistive exercise training.

Unit 7. Flexibility Training

General Outcome:

- 7.0 The students should be able to understand the objectives and methods of flexibility training to increase range of motion (ROM).

Specific Learning Outcomes:

Upon successful completion of this unit, the students should be able to:

- 7.1 Identify the three principle methods of stretching and understand the differences between ROM improvement generated through stretching versus strength training.
- 7.2 Understand myths related to stretching as well as various activities that lead to muscle foreshortening.
- 7.3 Understand proprioceptive responses to muscular contractions and stretching and how they are integrated with different methods of improving ROM.
- 7.4 Understand how stretching is appropriately incorporated into fitness programs.
- 7.5 Understand special considerations relating to safety in stretching, especially precautions with the low back.

Unit 8. Exercise Prescription

General Outcome:

- 8.0 The students should be able to understand the objectives of exercise prescription and the five basic components of program design which are common to all four areas of physical fitness training.

Specific Learning Outcomes:

Upon successful completion of this unit, the students should be able to:

- 8.1 Differentiate continuous from discontinuous aerobic activity and recognize how to vary components of program design for each type of exercise.
- 8.2 Differentiate muscular strength training from endurance training and recognize how to vary components of program design for different workout routines.
- 8.3 Differentiate the three principle methods of flexibility training and recognize how to vary components of program design for each type.

Unit 9. Injury Prevention and Emergency Procedures

General Outcome:

- 9.0 The students should be able to understand potential areas for overstress during exercise and be aware of not only how to avoid them but also how to react to them with appropriate emergency responses which are not covered in CPR and First Aid courses.

Specific Learning Outcomes:

Upon successful completion of this unit, the students should be able to:

- 9.1 Understand the physiological responses to overexercise such as nausea, syncope, hyperventilation, hypoglycemia, heat problems, etc.
- 9.2 Understand typical overuse injuries such as bursitis, tendinitis, metatarsalgia, plantar fasciitis, sprains, strains, stress fractures, chondromalacia, shin splints, etc.
- 9.3 Understand those anatomical abnormalities that represent contraindications to certain types of exercise.
- 9.4 Understand appropriate directives related to exercise prescription which ensure safe and progressive program design in order to avoid overexercise and overuse injuries.
- 9.5 Understand and be able to apply general first aid treatment to minor overuse injuries, to be able to respond appropriately to overexercise and to know when it is necessary to refer to medical help or to activate a professional emergency response.