COURSE TITLE: Exercise Science (WEX-164)
COURSE CREDITS/HOURS: 3 lectures, 1 lab; 3 credits
PREREQUISITE: None
SEMESTER & YEAR: Fall & Spring
COURSE NUMBER: WEX-164
MEETING TIMES & LOCATIONS: To be announced
INSTRUCTOR: All
OFFICE LOCATION: G-207
PHONE: 201-447-7899
DEPARTMENTAL SECRETARY: Betty Highkal
OFFICE HOURS: Vary
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COURSE DESCRIPTION:
Exercise Science is a theory based investigation of the effects of exercise on human health, fitness and sport performance. Emphasis on basic principles of exercise physiology, exercise prescription, bioenergetics, body composition, training programs, and practical applications to the exercise setting. Recommended as a pre-requisite to WEX-106, WEX-182, WEX-183 and WEX-184.

OUTCOMES STATEMENT:
To investigate exercise and its physiologic effects to fitness and health in contemporary society.

COURSE OBJECTIVES:
A. To identify the anatomy and physiology of selected body systems as they are affected by exercise, i.e. musculoskeletal, cardiovascular, body composition, etc.
B. To analyze the bioenergetics of exercise relative to the intensity and duration of exercise performance.
C. To investigate the use of exercise variables (intensity, frequency, duration) in the development of exercise prescriptions.
D. To examine the characteristics of selected exercise program designs.
E. To explore the elements of body composition relative to the energy question.
F. To determine the exercise needs and appropriate adjustments for selected special populations.
STUDENT LEARNING OBJECTIVES:
A. Students shall, in writing or orally, identify selected anatomical structures and how they are affected by exercise.
B. Students shall compare the energy systems used during exercise relative to time and intensity.
C. Students shall formulate in writing specific exercise prescriptions that address aerobic and anaerobic programming.
D. Students shall contrast three corollaries of the energy equation relative to the effect on body composition.
E. Students shall distinguish appropriate adjustments in exercise programs for selected special population.

MEANS OF ASSESSMENT
A. Shall prepare a visual presentation indicating how exercise (RT) involves Wolf’s law.
B. Select three exercise activities which involve the energy system and develop a scenario reflecting how that system is involved.
C. Case study – develop Exercise Rx.
D. Case study – energy equation.
E. Journal – work period expectations of progress from a special population group.

COURSE CONTENT:
A. Exercise Perspectives
   1. Activity, exercise, conditioning
   2. Fitness and Health
   3. Health-related
   4. Exercise as medicine, business, personal endeavor
B. Musculoskeletal considerations – relative to exercise
   1. Skeletal system – anatomy, physiology
C. Cardiovascular consideration – relative to exercise
   1. Heart, blood vessels – circulation
   2. Lungs, respiration
   3. Health variables – CHD, Diabetes, Obesity
   4. Exercise considerations – HR, recovery, effects
D. Body composition
   1. Determining: body weight, lean weight, fat weight
   2. Energy equation – caloric expenditure and intake
   3. Weight management and exercise
E. Exercise programs and considerations
   1. Exercise variables - frequency, intensity, duration
   2. Exercise prescription – aerobic, anaerobic
   3. Fitness measures – VO2, strength, flexibility, composition
   4. Exercise precautions, injuries, contraindications
F. Exercise special considerations
   1. Symptomatic groups – elderly, diabetic, CHD, etc.
   2. Exercise modifications and prescription
PROCEDURE, TECHNIQUES AND METHODS
A. Lecture/discussion
B. Group problem solving
C. Audio-visual aids
D. Reading/writing assignments
E. Case studies
F. Resources

GRADING:
A. Subjective and objective testing (quizzes/exams)
B. Written assignments
C. Audio-visual aids
D. Group projects

SUGGESTED READING:

LEARNING RESOURCES/FACILITIES:
A. Library – texts, periodicals, computer
B. Computer learning lab
C. Fitness Center
D. Track, Gymnasium, Pool

SPECIAL FEATURES OF THE COURSE:
Students will be assigned well-designed out of class writing/reading projects during the semester involving journals, research papers, articles, etc. The number and content of assignments are exclusive of writing (essay) required on exam.

The use of the internet to locate, review and evaluate selected websites appropriate to class content.

GRADING POLICY
A final grade for the course is based on the student’s performance on the required work for the course (writing assignments, examinations, quizzes, class presentations, attendance, etc.) and on his mastery of the material covered in the course. A student’s participation may also be evaluated and used in the determination of a final grade.

ATTENDANCE POLICY:
Students are expected to attend punctually every scheduled meeting of each course in which they are registered. Attendance and lateness policies and sanctions are to be determined by the instructor for each section of the course. These will be established in writing on the individual course outline. Attendance will be kept by the instructor for administrative and counseling
RULES & REGULATIONS:
At the beginning of the academic year, each student is expected to obtain a copy of the College Catalog, Student Handbook, and the Academic Calendar. The catalog contains information about the regulations and procedures essential to student life on campus. Every student is responsible for knowing the information included in the catalog and academic calendar.

ACADEMIC AND STUDENT FACILITIES:
Students are referred to the College Catalog which contains a complete listing and description of available facilities and services including but not limited to: the Silverman Library, Office of Specialized Services, Bookstore, Graphics lab, Tutoring Center, Athletic and Exercise facilities, etc.

PROPOSED COLLEGE CALENDAR

Week 1  Overview of exercise: activity, exercise, conditioning; fitness & health – relationships, fitness parameters, exercise as medicine.

Week 2  Terminology related to the human body and movement, i.e. anterior, posterior, etc. Skeletal anatomy/physiology, names and location of bones, relationship to muscle.

Week 3  Muscular system; anatomy & physiology; improvement i.e. anterior, posterior, etc. Skeletal anatomy/physiology, names and location of bones; relationship to muscle.

Week 4  Major muscle group/muscle as agonist, antagonist, synergist, application to human movement and specific exercise movements.

Week 5  Muscle physiology. Anatomy of muscle; sliding filament theory; fiber types, Innervation, and motor limits.

Week 6  Bioenergetics – energy systems; aerobic alactate; anaerobic glycolysis; aerobic glycolysis; beta oxidation.

Week 7  Energy systems dated to exercise prescriptions and time of energy production relationships.

Week 8  Exercise Rx for aerobic exercise; heart rate reserves calculations, RPE scale; Health, Fitness, Fat loss.

Week 9  CV function, EKG and effects of exercise on aerobic capacity.

Week 10 Exercise Rx for aerobic exercise; strength, creating lean body mass; variables, hydrotrophy, Wolfe’s law.
Week 11  
Training effects and health benefits of exercise.

Week 12  
Special populations and exercise; PCHD; Obese; Hypertension; Diabetes; Osteoarthritis; Pregnancy; Deodorants, children.

Week 13  
Body composition, Somatotype.

Week 14  
Body composition, weight management, energy equation, metabolism.

Week 15  

Course sequence and content are subject to change without notice as emphasis on course content may vary.