ZOOL 254
Exercise Therapy: An Introduction to the Role of Exercise and Physical Activity in Wellness and Fitness
3 Credits

INSTRUCTOR: Ed Bernauer, Ph.D.
OFFICE: 107 Imiloa
OFFICE HOURS: Monday 2:00 – 3:00 pm and Wednesday 4:00 – 5:00 pm
TELEPHONE: 235-7910
EFFECTIVE DATE: Spring 2011

WINDWARD COMMUNITY COLLEGE MISSION STATEMENT

Windward Community College is committed to excellence in the liberal arts and career development; we support and challenge individuals to develop skills, fulfill their potential, enrich their lives, and become contributing, culturally aware members of our community.

COURSE/CATALOG DESCRIPTION

An introduction to the concept of exercise specificity and the associated physical and biological dimensions. These dimensions serve as a basis to categorize all physical activity for purposes of clinical assessment, preventative management, and/or remediation of functional wellness and fitness. Physical activities of various types and modalities are reviewed with respect to their affect on underlying physiological mechanisms that maintain and regulate physiological balance.

A wide array of physical activities are categorized with respect to their essential physical dimensions and their applications with respect to frequency, intensity, duration, and speed of use. The biological stages of growth and development or organ-systems are cross referenced as critical aspects of the role of physical activity in the acquisition and maintenance of wellness and fitness throughout life. Special attention is given to the role of the physical activity as a counter measure to the sedentary lifestyle hypokinesis as it affects one’s functional biological mental, emotional and immunological states. Particular attention will be given the early growth and development and the aging process. Comparison of Western and Eastern exercise regimens will be made as relevant to wellness and fitness.

Activities Required at Scheduled Times Other Than Class Times: None

Prerequisites suggested: Zool 141/141L or Biol. 100

Recommended preparation and basic skills: High School Chemistry, Biology or consent of instructor.

SPECIFIC LEARNING OUTCOMES: Anticipated Student Learning Outcomes:
1. To understand the biological impact of exercise.
2. To understand the specificity of exercise and its use.
3. To be able to discriminate the impact of exercise with respect to gender and age.
4. To know the essential modalities and types of exercise.
5. To be able to describe the common factors and distinctions among the array of exercises, e.g., weight, hypertension, diabetes management and hypokinetic disorders.
6. To understand the biological benefits of Eastern exercise regimens, e.g., Yoga, Qi Gong, and Tai Chi.
7. The safe use of exercise during pregnancy and in year one of infant.
8. The safe use of exercise in senior/old age years.
9. To apply scientific logic to the selection and application of the many commercial product and procedures inundating the field.

OBJECTIVES OF THE COURSE:
1. To introduce basic terms, concepts and principles of exercise, fitness and wellness.
2. To introduce the fundamental classification of exercise biology and its underlying process.
3. To explore the specificity of exercise and its multiple modes of application and related responses.
4. To introduce both the Western and Eastern approaches to Wellness.
5. To introduce guidelines for assessing and planning a Fitness-Wellness Program.
6. To introduce, discuss, and practice the factors associated with a positive lifestyle.

COURSE CONTENT

Concepts or Topics

- The historical evolution of the underlying factors that describe health, wellness, fitness and motor ability: general wellness/organic soundness; general motor ability and development; general motor fitness; physical fitness/reserve capacities
- Basic physical dimensions of all human function physical activity and its health benefits
- Exercise therapy: an introduction of its concepts and practices
- Assessment methods and procedures to measure physical fitness and wellness
- Review of published population norms and their utilization in wellness & fitness analysis
- Exercise and the cardiovascular system
- Exercise and the pulmonary system
- Muscle skeletal system, structure and function
- Bones and joints, structure and function
- Muscle joints assessment of range of motion
- Soft tissue – connective tissue
- Neuromuscular system and motor development and function
- Body weight
- Exercise prescription: ACSM Guidelines; Pre-participation screening; Fitte principles
- Exercise Prescription for healthy and select diseases
- Exercise prescription for children and adolescents, middle years, elderly
- Exercise in the treatment of cardiovascular disorders
- Exercise as a countermeasure to stress
- Treatment for pulmonary dysfunctions: exercise types for treatment of respiratory disease
• Exercise treatment of muscle skeletal disorders
• Exercise treatment of neuron-muscular dysfunction
• Obesity and metabolic diseases
• Exercise adherence and compliance: patient factors; program factors; exercise prescription guidelines
• Overview of established modalities of therapy: aquatic; walking/running; stretching; swimming; thermal; bicycling
• Relaxation - stress reduction – aging
• Mind body fitness: Yoga; Qi Gong; Tai Chi; Pilates
• Special physiology states

EXPECTATIONS OF STUDENT PERFORMANCE:
1. A working, practical understanding of the fundamental terms, concepts, and principles of physical activity, exercise, fitness and wellness.
2. To understand the distinctions among the many types of physical activities, is., endurance, flexibility strength, power, speed and balance.
3. To understand the underlying factors related to stress and its management.
4. To have the knowledge and skills to assess your basic fitness factors.
5. To have the knowledge and skills to project a personal wellness-fitness program.
6. To understand the essential factors in weight management and to project an effective exercise and nutrition program.
7. To be able to select from either the Western or Eastern regimens of formal exercise to meet your wellness goals.
8. To understand the essential stages of life and their particular needs to acquire and maintain life-long wellness and fitness.

COURSE TASKS ASSESSMENT AND GRADING
1. Participation in the discussion seminar 50 points
2. Report on visit to Practitioner
   A structured format will be provided each student prior to the visit. 25 points
3. Report I 75 points
4. ReportII 75 points
5. Final Comprehensive Report: Seminar 150 points
   TOTAL: 375 points

All tests will be of an objective nature.

EVALUATION:
A 90% - 100% of cumulative points possible (335 and above points)
B 80% - 89% of cumulative points possible (300 - 334 points)
C 70% - 79% of cumulative points possible (260 - 299 points)
D 60% - 69% of cumulative points possible (225 - 259 points)
F Below 60% of cumulative points possible (224 and below points)

I Incomplete. This temporary grade given at the instructor’s option when a student has failed to complete a small part of a course because of circumstances beyond the student’s control. All required work must be completed by the last day of instruction of the succeeding semester.
CR  The CR/NC option must be declared by the end of the 10th week of classes. Written consent of instructor is required for this option. Achievement of objectives at the C level or higher. Achievement of objectives at less than C level. (Formal grade)

NC  See CR above.

N  Achievement of objectives at less than C level. (Optional instructor’s grade)

W  Official withdrawal after the third week of a 16-week course and prior to the end of the 10th week. If a student officially withdraws by the end of the 3rd week of a 16-week course, the record of registration in this course will not appear on the student’s transcript.

LEARNING RESOURCES

PRIMARY TEXT RESOURCES


GENERAL REFERENCES AND RESOURCE INFORMATION

These texts may be used for selected readings and as additional reference materials.

8. The Alexander Technique by Richard Brennan, Barnes and Noble, 1991
12. Selected references of Eastern Exercise Regimens: Tai Chi, Qi Gong, Yoga.
## Terms and Concepts

<table>
<thead>
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<th>Key Term</th>
<th>Concept</th>
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<th>Concept</th>
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<td>Homeostasis</td>
<td>Control</td>
<td>Speciﬁcity</td>
<td>Regulation</td>
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<td>Speciﬁcity</td>
<td>Overload</td>
<td>Frequency</td>
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<td>Frequency</td>
<td>Repetition</td>
<td>Time/Duration</td>
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<td>Time/Duration</td>
<td>Types of Exercise</td>
<td>Fatigue</td>
<td>Enjoyment</td>
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<td>Fatigue</td>
<td>Impairment</td>
<td>Wellness (health/ﬁtness)</td>
<td>Adaptation</td>
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<td>Wellness (health/ﬁtness)</td>
<td>Functional Capacity</td>
<td>Aging</td>
<td>Fitness/Vitality</td>
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<tr>
<td>Aging</td>
<td>Biological Age</td>
<td>Energy Metabolism</td>
<td>Average Age</td>
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<tr>
<td>Energy Metabolism</td>
<td>Aerobic/Anaerobic</td>
<td>Exercise Training</td>
<td>Basal Metabolism</td>
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<tr>
<td>Exercise Training</td>
<td>Cross Training</td>
<td>Free Energy</td>
<td>Over Training</td>
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<td>Free Energy</td>
<td>Kinetic Energy</td>
<td>Hypertrophy</td>
<td>Potential Energy</td>
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<td>Hypertrophy</td>
<td>Hyperplasia</td>
<td>Hypertension</td>
<td>Hyper-function</td>
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<tr>
<td>Hypertension</td>
<td>Stress response</td>
<td>Perceived Exertion</td>
<td>Psychosomatic</td>
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<td>Perceived Exertion</td>
<td>Hypokinesis</td>
<td>Somatotype</td>
<td>Hyperkinesis</td>
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<tr>
<td>Somatotype</td>
<td>Body Composition</td>
<td>Negative Feed Back</td>
<td>Normal Weight</td>
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<tr>
<td>Negative Feed Back</td>
<td>Up Regulation</td>
<td>Warm-up Exercise</td>
<td>Down Regulation</td>
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<tr>
<td>Warm-up Exercise</td>
<td>Thermal/Vascular</td>
<td>Neuro-muscle readiness</td>
<td>Stretching/Ventilation</td>
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<tr>
<td>Neuro-muscle readiness</td>
<td>Exercise Types</td>
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<td>Exercise Modalities</td>
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### Sports Activities

<table>
<thead>
<tr>
<th>Activity</th>
<th>Types of Exercise</th>
<th>Exercise Activities</th>
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<tbody>
<tr>
<td>Volleyball</td>
<td>Ambulatory</td>
<td>Isotonic</td>
</tr>
<tr>
<td>Tennis</td>
<td>Stationary</td>
<td>Isometric</td>
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<tr>
<td>Badminton</td>
<td>Standing</td>
<td>Isokinetic</td>
</tr>
<tr>
<td>Softball</td>
<td>Seated</td>
<td>Plyometric</td>
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<tr>
<td>Surfing</td>
<td>Cycling</td>
<td>Concentric</td>
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<tr>
<td>Gymnastics</td>
<td>Aquatic</td>
<td>Eccentric</td>
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<td>Soccer</td>
<td>Marathon</td>
<td>Resistive</td>
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<tr>
<td>Rowing</td>
<td>Climbing</td>
<td>Ballistic</td>
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<tr>
<td>Tri Athlete/Iron Man</td>
<td>Weight Lifting</td>
<td>Impact/Low Impact</td>
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<tr>
<td>Golf</td>
<td>Callisthenic</td>
<td>Static</td>
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**Eastern Cultural Exercise Arts**

- Taoist
- Yoga
- Tai Chi Ch’uan
- Karate
- Heike
- Pilates
- Taikuando
Brief Background

- The statement “A sound mind in a sound body” declared in BC set a perspective of body and soul/mind being an integral whole. The education of the whole person followed.
- Principal/Major differences evolved in “Healing” between the Eastern and Western Cultures. Also the view of physical activity and its role in the establishment and maintenance of Wellness and acquisition of fitness in the two cultures.
- Industrial revolution and the reduction of work on the land resulted in an increase in environmental diseases evoked by the corrupted hygiene of urban living and lack of physical fitness.
- Military conscription and the need to establish standards of physical performance.
- Cozens research and development of normative performance at Stanford in the 1920s.
- Factor analysis and the identification of fundamental physical abilities, e.g., strength, endurance, power, speed, balance and flexibility.
- Scientific research related to military interests produced important insights into the underlying physiology of work, exercise, and nutrition.
- Centers for Disease Control and Prevention initiated a data collection and focus on the domains of physical effort, and health related anthropometric data. Normative values were created for ethnic gender and age groups.
  Hawaiians are compared to other ethnic groups.
  The comparisons often do not favor the Hawaiians.
- The coalescence of post industrial influence on reduced physical activity, changes in dietary consumption has led to overweight – obesity, CV-disorders, metabolic syndrome and hypertension to mention a few.
- The longer life span imposes a more discriminating view of the role of exercise and its more specific usage for maintaining wellness and achieving fitness. Also how the application specific exercise aids the maintainers of homeostasis.
- Not simply the engagement in sports for their psychobiological benefits but their specific applications related to age, gender, ethnicity, physiological state (pregnancy or chronic neuromuscular or musculoskeletal disorders).
- Preventive medicine cries out for his education and knowledge for the average individual. Wellness is a personal responsibility. It needs the support of a resource repository for the essential knowledge of system of exercise.
- The course will address both Western and Eastern regimens of exercise. Special conditions, such as pregnancy and early infant development, old age, and those burdened with chronic diseases, e.g., asthma, diabetes, neuromuscular and cardiovascular diseases, etc.
- Yoga, Qi Gong, and Tai Ji Quan are presented to better understand their role in exercise benefits.
- The development of Wellness Center to assess, guide and promote the part of education that deals with a “sound man”.
COURSE CONTENT

Concepts or Topics

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COURSE TASKS ASSESSMENT AND GRADING

1. Term Paper
   Elective topic on a muscle joint injury and the diagnosis and rehabilitation; topic to be approved by instructor.

2. Participation in the discussion seminar = 50 points
5. A student can determine his/her current grade at any time during the semester by dividing his/her cumulative score by the cumulative points possible (290), and converting into a percentage and referring to the table of Letter Grades.

6. Any student wishing to be informed of his/her Final Exam grade and/or semester grade in advance of the official report of grades should email a request for the grades to the instructor immediately after the Final Exam. The student may also provide the instructor a stamped, self-addressed postcard or envelope on the day of the Final Exam with an enclosed note requesting the grades.

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