KINE 6500

Exercise Technology I: Principles of Exercise Testing and Interpretation

Ex Tech I

Credit Hours: 4 hours; Lec 3, Lab 1

Syllabus revised: 9 Jul 2014

Instructor:  Dr. Jim McDonald               Email: [jrm0013@auburn.edu](mailto:jrm0013@auburn.edu)

Office: Room 169, Kinesiology Building, 301 Wire Road

Office Hours: Tues & Thurs                    Office Phone:  844-1922

1:00 – 3:00 pm

**Required Textbooks**

**Textbook for 5500/6500**

**Clinical Exercise Physiology,** Erhman J, Gordon P, Visich P, & Keteyian S., Human Kinetics, 2013, 3rd Edition, ISBN 978-1-4504-1280-3

**ACSM’s Health-Related Physical Fitness Assessment Manual**, Lippincott, Williams & Wilkins, 4th Edition, 2013, ISBN 0-7817-7549-6

**Supplemental Textbooks:**

**ACSM's , Guidelines for Exercise Testing and Prescription,**Lippincott, Williams & Wilkins, 2013, 9th Edition, ISBN 0-7817-6903-7

**COURSE DESCRIPTION**

This course has been designed to develop the knowledge, skills and abilities to function as an exercise professional in fitness and clinical exercise settings.  The topics covered are designed to help the student prepare for certification examinations offered by the **American College of Sports Medicine (ACSM).**

The course will focus on the common physical assessments, testing used in clinical and fitness settings, the selection of appropriate assessments, results interpretation and the application of assessment results for exercise prescription for normal and special populations as well as populations with chronic disease. Laboratory experiences are designed to develop competencies in physical assessments. Laboratory experiences will include body composition, musculoskeletal fitness, pulmonary function, cardiovascular function, and exercise tests for functional capacity and cardiovascular fitness with electrocardiogram.

**Student Learning Outcomes:**

**After successfully completing this course, you will be able to:**

1. Explain and discuss the underlying principles and rationale for health and fitness screening, blood profile analysis , measurements of heart rate, rhythm and electrical activity, blood pressure, cardiorespiratory fitness (CRF) testing, body composition, pulmonary testing, musculoskeletal fitness and sports related testing.
2. Understand and explain the basic pathophysiology related being sedentary and obese including cardiovascular disease, pulmonary disease, dyslipidemia, hypertension, diabetes, and metabolic syndrome.  Identify general drug groups associated with medical intervention in these diseases.
3. Use pre-test screening to determine the appropriateness of exercise, exercise testing, and cardiovascular disease risk stratification based on blood pressure, cholesterol levels, physical activity or other factors.
4. Understand basic safety considerations for an exercise facility and for exercise testing.  Understand basic treatment for common injuries seen in a exercise facility
5. Use direct and indirect techniques to assess muscular strength, flexibility, and endurance
6. Understand the underlying principles of body composition testing and become familiar with techniques to estimate body composition using the skin-fold methods, bioelectrical impedance, DEXA and anthropometrical techniques.
7. Understand the physiologic basis of blood pressure. Measure systolic and diastolic blood pressures at rest and during exposure to various environmental stressors using a stethoscope and sphygmomanometer
8. Understand the cardiorespiratory changes that occur with exercise and how it can be measured.  Conduct sub-maximal graded exercise tests for the purpose of examining cardiovascular responses to exercise and determining exercise capacity
9. Demonstrate proficiency using metabolic calculations to determine body composition, estimates of cardiovascular capacity, exercise energy expenditure and exercise workloads.
10. Demonstrate the ability to prepare a subject for a 12-lead electrocardiogram.  And be familiar with a normal ECG reading at rest and during a graded exercise test.
11. Understand and discuss the appropriate testing and exercise prescription for populations with chronic disease including: metabolic disorders; cardiovascular disease; respiratory disease; cancer and disorders of the bones and joints.

**Grading Scale**

There are a maximum of 250 total points available in this course.

Grades "A" = 250 - 230; "B" = 229 - 210;  "C" = 209 - 190; "D" = 189 - 170; Labs (150 Points)

 Exams (250 Points)

There will be a total of 4 exams each worth 50 points.  Exams are designed to test your knowledge in areas covered in assigned readings, lectures and laboratory experiences. Make-up exams will only be given for students with documented excused absences. Students with excused absences must be prepared to take the exam on the day they return to class.

You will present one paper to the class which is worth 25 points. You will be graded on your preparation, your ability to present the information in a timely manner (15 min ± 2 min) and your ability to answer questions on the topic. Additionally, there will be a participation grade for each student based on their preparation for the presentation. The total points available for this portion of the course are 50.

There will be joint laboratory sessions with KINE 5500. If you are planning on taking KINE 6550 these laboratories are mandatory.

**Class Policies**

Attendance:  You are expected to attend all classes; lectures will not be repeated or recorded.  Students are expected to attend all classes, and will be held responsible for any content covered in the event of an absence. Excused absences are defined in the Student Policy eHandbook, [www.auburn.edu/studentpolicies](http://www.auburn.edu/studentpolicies).

Make up policy: Arrangements to make up a missed examination due to a properly authorized absence must be initiated by the student within one week of the end of the period of the excused absence.  In unusual circumstances such as an extended absence to illness, the make-up exam will occur within two weeks of the absence.

Accommodations: Students who need accommodations are asked to electronically submit their approved accommodations through AU Access and to arrange a meeting during office hours the first week of classes, or as soon as possible if accommodations are needed immediately. If you have a conflict with my office hours, an alternate time can be arranged. To set up this meeting, please contact me by e-mail. If you have not established accommodations through the Office of Accessibility, but need accommodations, make an appointment with the Office of Accessibility, 1228 Haley Center, 844-2096 (V/TT).

Honesty Code: Students are expected to do their own work and cheating will not be tolerated.  Please see University policies at [https://sites.auburn.edu/admin/universitypolicies/default.aspx](https://cas.auburn.edu/owa/redir.aspx?C=bc06a9c32636407d8a7ce9284b94e692&URL=https%3a%2f%2fsites.auburn.edu%2fadmin%2funiversitypolicies%2fdefault.aspx)

**Course content outline:**

Week 1 – 18 Aug Class overview,

Physical Activity and Health

Week 2 – 25 Aug Physical Activity Screening

Risk Classification

Pre-Exercise Tests – HR & BP

Week 3 – 1 Sep Pre-Exercise Tests – Body Comp

Pre-Exercise Tests – Pulmonary Function

Electrocaridogram

Week 4 – 8 Sep Exercise Testing – cardiorespiratory Fitness

Exercise Testing – Muscular Fitness

Exercise Testing – Balance & Flexibility

Week 5 – 15 Sep Exercise Test interpretation

Exercise Prescription – normal populations

Exercise prescriptions – special populations

Week 6 – 22 Sep Obesity and Health

Diet, Exercise and Weight Loss

Week 7 – 29 Sep Cardiovascular Disease

Coronary Artery Disease

Acute Coronary Syndromes

Week 8 – 6 Oct CVD - revascularization

Chronic Heart Failure

Week 9 – 13 Oct Pulmonary Disease

Week 10 – 20 Oct Cancer

Week 11 – 27 Oct Cachexia

Week 12 – 3 Nov Aging

Week 13 – 10 Nov Sarcopenia

Week 14 - 17 Nov Behavior Change

Week 15 – 24 Nov Thanksgiving Break

Week 16 – 1 Dec Clinical Exercise Physiology - Careers

**Lab Schedule**

Week 5 – 15 Sep Resting Blood Pressure

Week 6 – 22 Sep Body Composition Testing

Week 7 – 29 Sep Body Composition Testing

Week 8 – 6 Oct Pulmonary Testing

Week 9 – 13 Oct Cardiorespiratory Testing

Week 10 – 20 Oct Electrocardiogram

Week 11 – 27 Oct Cardiorespiratory Testing

Week 12 – 3 Nov Muscular Strength and Endurance Testing

Week 13 – 10 Nov Flexibility and Balance Testing

Week 14 - 17 Nov Skills Review Laboratory

Week 15 – 24 Nov Thanksgiving Break

Week 16 – 1 Dec Comprehensive Lab Final