KINE 5500

Exercise Technology I: Principles of Exercise Testing and Interpretation

Ex Tech I

Fall 2014

Credit Hours: 4 hours; 3 Lec and 1 Lab

Prerequisites/Co-requisites:  KINE 3680 – Physiology of Exercise

Syllabus revised: 7 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**

**ACSM's Resources for the Health Fitness Specialist,** Lippincott, Williams & Wilkins, 2013, ISBN 978-1-4511-1480-5

**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 introduce and develop your 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), National Strength & Conditioning Association (NSCA) and American Council on Exercise (ACE)**.

The course will focus on the underlying physiology that is involved in 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 and chronic disease risk reduction.

**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. Using 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 exercise testing in sport and identify specific types of testing including agility, speed, power.

**Grading Scale**

There are a maximum of 330 total points available in this course.

Grades "A" = 330 - 300;  "B" = 363 - 328;  "C" = 327 - 292; "D" = 291 - 256; "F" = 255 and below

 Labs (130 Points)

There are 11 laboratory sessions scheduled and each will have an accompanying quiz with 8, 10 points each.   There will be 2 homework assignments associated with the lab work each worth 10 points.  An there will be a lab final worth 30 points. **Attendance at the laboratory is mandatory**.  If you do not attend a lab session you will receive not get credit for the lab quiz for that day. Other consequences of missing a lab are addressed in the attendance policy.

 Exams (200 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.  The comprehensive final exam, will be administered at the scheduled exam time at the end of the semester.

**Class Policies**

Attendance:  You are expected to attend all classes, lectures will not be repeated or recorded. **Attendance at the laboratory sessions is mandatory.**  An unexcused absence from a laboratory session will result in a one grade drop in the overall course grade.  If there are three unexcused absences the course grade will be "FA".  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,

Careers in Fitness and Internships

Physical Activity and Health

Week 2 – 25 Aug Physical activity and disease

Physical Activity Screening

Risk Factor Assessment

Week 3 – 1 Sep Risk Classification

Principles of Exercise testing

Body Composition

Week 4 – 8 Sep Body Composition

Obesity and chronic disease

Blood Pressure

Week 5 – 15 Sep Cardiorespiratory Fitness

Cardiorespiratory Fitness

Cardiorespiratory Fitness Assessment

Week 6 – 22 Sep Electrocardiogram

Exercise Prescription for Cardiorespiratory Healthy Populations

Test #1

Week 7 – 29 Sep Muscular Strength and Endurance

Muscular Strength and Endurance

Exercise Prescription for Muscular Fitness in Healthy Populations

Week 8 – 6 Oct Assessing Flexibility

Exercise Prescription for Flexibility

Assessing Balance

Week 9 – 13 Oct Balance Training Programs

Testing for Muscular Fitness

Testing for Muscular Fitness

Week 10 – 20 Oct Exercise Prescription for Muscular Fitness

Assessing Flexibility

Test #2

Week 11 – 27 Oct Basic Nutrition

Basic Nutrition

Weight Management

Week 12 – 3 Nov Exercise Programming Across the Lifespan

Exercise Programming Across the Lifespan

Exercise Programming Across the Lifespan

Week 13 – 10 Nov Chronic Disease and Exercise

Chronic Disease and Exercise

Chronic Disease and Exercise

Week 14 - 17 Nov Behavior Change

Behavior Change

Test #3

Week 15 – 24 Nov Thanksgiving Break

Week 16 – 1 Dec Health and Fitness Business

Health and Fitness Business

Health and Fitness Business

**Laboratory Schedule**

Week 1 – 18 Aug Class overview,

Week 2 – 25 Aug Principles of Assessment

Week 3 – 1 Sep Metabolic Calculations

Week 4 – 8 Sep Risk Classification

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