DEPARTMENT OF Kinesiology
KINE 5550 & 6550
EXERCISE TECHNOLOGY II
FALL 2010

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COURSE DESCRIPTION

This course continues to develop the knowledge, skills and abilities (KSAs) for exercise testing and prescription that were introduced in Exercise Technology I (KINE 5500/6500). Course topics will address special considerations for pre-exercise health evaluations, fitness testing techniques and procedures, data collection, and data interpretation in healthy and clinical populations. Course material will prepare students to pass the *ACSM certification examination for Health/Fitness Specialist* and to attain entry-level jobs in clinical exercise settings and the health & fitness industry. In addition, students in Exercise Technology II will refine their KSA competencies by conducting health & fitness assessments as part of the **Tiger*Fit* Program**. *The* **Tiger*Fit* Program** has been developed to serve our community by providing comprehensive health & fitness assessments for Auburn University faculty and staff, alumni, members of local running and cycling clubs, and citizens in the surrounding communities.

COURSE OBJECTIVES

After this course, students will be able to:

1. Demonstrate the ability to identify contraindications for exercise testing and participation, stratify individuals based on their cardiovascular disease risk and select appropriate assessment strategies from pre-exercise health appraisal instruments

2. Demonstrate the ability to measure and interpret heart rate, blood pressure, ECGs, RPE, at rest and during exercise

3. Demonstrate the ability to conduct a graded exercise test, including knowing when to appropriately terminate the test and monitor an active cool down.

4. Demonstrate the ability to assess and interpret measures of pulmonary function, cardiovascular fitness, body composition and musculoskeletal fitness in healthy and clinical adult populations

5. Explain how major classes of cardiovascular and metabolic drugs influence heart rate and blood pressure responses to exercise

6. Identify abnormal ECGs, particularly common dysrhythmias and conduction disturbances

7. Develop individualized exercise prescriptions from health and fitness assessment results

8. Discuss results and exercise prescription recommendations with clients undergoing health and fitness assessments in the **Tiger*Fit* Program**

9. Demonstrate an understanding of program administration fundamentals, including: 1) a basic knowledge of the health & fitness industry; 2) how to develop, measure, and assess program outcomes, and; 3) how to develop, maintain and evaluate program quality

COURSE REQUIREMENTS

Preparation:

You are expected to keep up with all of the assigned readings and course notes in order to be prepared to discuss class topics and practice skills. You must provide a copy of your current CPR certification card by **September 20th** in order to participate in the **Tiger*Fit* Program**. You are also be expected to complete various on line courses concerning laboratory safety form the University Risk Management and Safety Office. The courses required will be specified during the first week of class

Presentation:

You are expected to come to class appropriately dressed for the daily assignment. This means wearing appropriate attire for review and practice (e.g., shorts, t-shirt - ladies wear or bring a sport bra, jogging shoes) and bringing a calculator, texts, and the appropriate data collection forms to every class.

You are expected to wear khaki slacks, a casual dress shirt (with collar) and shoes for each of the scheduled health & fitness assessments. In the case that inappropriate attire is worn on a **Tiger*Fit*** testing date, you will be asked to leave and return only after you change into appropriate attire.

Attendance:

It is critical that you attend each class session and are punctual. Your attendance in this class is mandatory. During the first few weeks of this course you will be developing and practicing the skills you will need to competently perform the health & fitness assessments in the **Tiger*Fit* Program**. During the last several weeks of the semester, your presence in each class is required because you will be responsible for collecting data in some aspect of the assessment process (e.g., serving as a client's host, conducting GXTs, measuring body composition, strength, endurance & flexibility, etc). Everyone involved with these assessments is counting on you to do your job. If you have to miss class for any reason, you are required to inform Mr. McDonald at least 24 hours in advance. If the absence is due to an emergency, I expect you to inform me as soon as possible. If the absence is a documented excused absence it will not count against your grade. Excused absences are defined in the Tiger Cub Student Handbook. Thirty points (-25 pts), ¼ letter grade, will be deducted from your course point total for an unexcused absence from class – unless it is a scheduled **Tiger*Fit*** date. Sixty points (-50 pts), ½ of a letter grade, will be deducted from your course point total for an unexcused absence from a **Tiger*Fit*** session. Four unexcused absences will result in an FA for the class.

Accommodations:

Students who need accommodations are asked to arrange a meeting with me during my 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 alternative time can be arranged. To set up this meeting, please contact me by e-mail. Bring a copy of your *Accommodation Memo* and an *Instructor Verification Form* to the meeting. If you do not have an Accommodation Memo but need accommodations, make an appointment with the Program for Students with Disabilities at 1244 Haley Center, 844-2096.

TEXTBOOKS

ACSM. ACSM's Guidelines for Exercise Testing and Prescription. Lippincott, Williams & Wilkins, 8th Edition, 2009, ISBN 0-7817-6903-7

ACSM. ACSM's Resource Manual for Guidelines for Exercise Testing & Prescription. Lippincott, Williams & Wilkins, 6th Edition 2009, ISBN 0-7817-6906-8

ACSM. ACSM's Health-Related Physical Fitness Assessment Manual. Lippincott, Williams & Wilkins, 2nd Edition, 2007, ISBN 0-7817-7549-6

C. Dunbar & B. Saul. ECG Interpretation for the Clinical Exercise Physiologist. Lippincott, Williams & Wilkins, 1st Edition, 2009, ISBN 0-7817-7865-4

ACSM. ACSM's Certification Review. ACSM, Lippincott, Williams & Wilkins, 3rd Edition, 2009, ISBN 0-7817-6901-3

EVALUATION

Overview:

Your course grade will be determined from the total number of points you earn relative to the 1000 total points available to earn in the course. An "A" means you demonstrated excellence in your knowledge of the material covered in class, professionalism, teamwork, and competencies. In order to receive an "A", you must earn ≥ 90% of the total points available in the course. A grade of "B" means you are above average in your knowledge of the material covered in class, professionalism, teamwork, and competencies. In order to receive a "B", you must earn between 80 - 89% of the total points available in the course. In order to receive a "C", you must earn between 70 - 79% of the total points available in the course. A grade of "C" means you demonstrated the minimum required knowledge, skills and competencies needed to function as an exercise professional in a clinical, corporate or commercial setting. A grade of "D" indicates that you are not yet ready to function competently as an exercise professional. Additional descriptions for grades in this course are found below:

Grade Descriptions:

A (90.0-100%): Excellent: A full "A" grade reflects superior knowledge and understanding of the material covered in this course. This grade also reflects demonstrated excellence in all of the skills and abilities outlined and covered in coursework and the outreach program. In order to receive an "A" you must go beyond simply fulfilling your role in conducting health and fitness assessments or repeating material covered in lecture and your assigned reading. There is a distinct difference between "repetition" and "understanding." To get an "A" answer you must go beyond this, showing that you understand and can integrate all of the material by adding further content, linkages to additional concepts, and similar material not directly covered in the lecture and assigned readings. You must also be able to develop an excellent rapport with clients in our outreach program. You must be able to confidently explain and demonstrate procedures and concepts to clients in technically correct, clear, and concise terms. It must be noted that grades of 100 percent are very rare, and reflect perfection - that is, such an answer could not be improved in any way, there are no factual errors in your answers or the information you provide to clients, nothing important has been left out, and you have

done an incredible job of demonstrating an understanding of the material covered in this class. A grade of 90 percent reflects work that has achieved all of the assigned goals, without any notable omissions or factual errors and has demonstrated a level of understanding beyond that required of the assignment. A grade of 90 percent is still considered a full "A" and reflects superior understanding - above and beyond the repetition of lecture notes and assigned readings - and the ability to demonstrate excellence in all of the skills and abilities included in coursework and the outreach program.

B Range (80.0-89.9%): Good – Above Average: A "B" grade reflects work that is good and above average, but that is not good enough to reach the "A" range. Typical reasons include important omissions in an assignment, explanation, demonstration, etc. (leaving out concepts or ideas that really need to be there), factual errors, perhaps from following the "shotgun approach" (write down everything you think you know about the client, in the hope that the instructor will find what he is looking for), and/or demonstrating skills and abilities that are very good but not perfected. Remember, even if your effort includes the correct material that the instructor is looking for, also including incorrect or inappropriate material indicates that you do not understand the material at the "A" level. A grade of 80 to 89.9 percent reflects work that has achieved all of the assigned goals, but has not adequately demonstrated a level of understanding or performance beyond that required of the assignment(s).

C Range (70.0-79.9%): Average: A grade of "C" reflects work that is average at best. Such a grade typically indicates work that reflects a basic understanding of many of the concepts involved in the assignment, but does not address or integrate these concepts in a very satisfactory manner. "C" assignments are generally not very well organized or written, often contain important errors of fact, important omissions from an answer, and/or demonstrated skills and abilities that may pass review but; otherwise, will not distinguish you as an exceptional health practitioner. Just doing what is expected or required as part of the outreach program is indicative of a "C" grade.

D Range (60.0-69.9%): Below Average: A "D" grade reflects work that is below average. In general, such a grade reflects performance that is not worthy of credit toward graduation with a kinesiology degree. A grade of "D" indicates that that you do not possess a basic understanding of the assigned material, and often reflects a very poorly organized and written argument or repeated lack of professional skills and abilities. In addition to common errors of fact and frequent omissions of relevant material, and poor performance of skills and abilities, assignments rarely reflect much independent thought beyond simply trying to repeat – and often incorrectly - material from the lecture, assigned readings, and laboratory work. This grade may also reflect an inability to contribute adequately to the outreach program because of excessive tardiness or unexcused absences.

F (below 60.0%): Unacceptable: An "F" grade reflects work that is completely unacceptable. Such work usually shows little resemblance to the assignment, whether because you left out large parts of the assignment, didn't bother to complete the assignment, acquired information from some other source that was written for a different assignment, and/or you fail to demonstrate the professional skills and abilities required for basic competency. This grade may also reflect an inability to contribute adequately to the outreach program because of excessive tardiness or unexcused absences.

Your knowledge, skills and abilities will be evaluated by written and practical examinations. You will be evaluated on your contributions to the development of a procedures manual that is used as a resource for our TigerFit assessments. You

will be evaluated on your professionalism, competency, and teamwork while conducting health & fitness assessments as part of the TigerFit Program. These evaluations are described in more detail below.

Quizzes - 400 points:

Your knowledge, skills and abilities (KSAs), as listed for the **ACSM Health/Fitness Specialist,** will be assessed using written and practical examinations and quizzes. There will be 8 quizzes worth 50 points each and will cover KSAs for HFS certification. The quizzes will be multiple choice and reflect the questions found in ACSM's Certification Review.

Final Exam - 200 points

The final exam will be a comprehensive examination cover all the KSAs required for HFS certification. The exam will be given at the prescribed date and time for the final exam in the course. You may earn to the final exam by scoring 80% or better the previous exams and quizzes and passing the ASCM HFS certification examination. Proof of passing the prior to the last day of class no less than a "B" grade for the course by participating in all TigerFit assessment dates and passing the ACSM Health & Fitness Specialist (HFS) examination and providing proof of your passing the exam prior to the last day of class. Please see Mr. McDonald to receive an *ACSM University Endorsed Program Discount Code* if you are planning to take the HFS exam. You will need this code when you register for the exam in order to receive a 50% discount on the cost of the exam. Please visit www.pearsonvue.com/acsm or call 1-888-883-2276 to schedule a time to take the ACSM certification exam. The exam is only available via computer-based testing at Pearson VUE testing sites. You will be given the full 200 points for the final exam is you passed the ACSM HFS exam.

TigerFit Lab Performance – 400 points:

TigerFit testing dates are scheduled on 8 weeks throughout the fall semester. Each weekly evaluation will be worth 50 points. You will be evaluated on 4 areas - professionalism, competency, teamwork, and data management - outlined below. You will be evaluated using a standardized evaluation form posted on *Blackboard*. These forms are designed to document your perceptions and constructive feedback from the instructor regarding how well you demonstrated the KSAs in each of the 4 areas during **TigerFit** sessions. You should recognize that the grading for each of these areas is somewhat subjective. Therefore, you will have the opportunity to review and discuss your current weekly evaluation form during the week following each evaluation. Weekly evaluation scores will be counted towards your overall course grade one week after the evaluation date (immediately after you have been able to review and discuss your scores with the instructor).

Professionalism:

You are expected to be punctual, come to class prepared, dress appropriately and interact professionally with the **TigerFit** clients. Your ability to explain testing procedures (e.g., explaining why the test is being performed, instructions for completing the tests, what you expect from the client, what they can expect from you during the test, importance of their test results and how they will be used in exercise prescription) will be evaluated. In addition, you should work with clients in a friendly, appropriate and courteous manner. This includes greeting clients and helping clients with any questions or concerns they might have.

Competency (Health & Fitness Assessment Data Collection):

It is imperative that you accurately record all client data necessary for optimizing client safety and determining their health and fitness status. The data you record will be used to generate individualized reports and

develop exercise prescriptions. Therefore, your ability to operate the equipment and instrumentation, record data accurately, clearly and in the proper format will be evaluated after each test date.

Teamwork (Your ability to work with your peers):
You will be evaluated on their ability to work with their peers. Special attention will be given to your ability to work with classmates assigned to or working at the same testing station. This includes preparing the station for client assessment, collecting and recording client data and station clean-up.

Data Management (Your ability to accurately record and interpret data):
You will be responsible for accurately recording and interpreting client results during data reduction and report generation. You will be graded on their ability to manage data, calculate and record health estimates from physiologic measurements (e.g., pulmonary function results, skin fold, hydrostatic weighing results, musculoskeletal assessment scores, cardiovascular responses to exercise, blood sample reports) and accurately record the results on client report forms.

COURSE TOPICS and RESOURCES
PRE-EXERCISE HEALTH SCREENING, RISK STRATIFICATION, and SAFETY

RESOURCES:
ACSM's Guidelines (8th Edition):
Chapter 1:   Benefits and Risks Associated with Physical Activity
Chapter 2:   Pre-Participation Health Screening and Risk Stratification
Chapter 3:   Pre-Exercise Evaluation
Appendix A: Common Medications
Appendix B: Medical Emergency Management

ACSM's Resource Manual (6th Edition):
Chapter 6:   Pathophysiology and Treatment of Cardiovascular Disease
Chapter 7:   Pathophysiology and Treatment of Pulmonary Disease
Chapter 8:   Pathophysiology and Treatment of Metabolic Disease
Chapter 10:   General Overview of Pre-participation Health Screening & Risk Assessment
Chapter 34:   Exercise Prescription and Medical Considerations
Chapter 42:   Behavioral Strategies to Enhance Physical Activity Participation
Chapter 50:   Exercise Program Safety and Emergency Procedures
Chapter 51:   Legal Considerations for Exercise Programming

ACSM's Health-Related Physical Fitness Manual (2nd Edition):
Chapter 1:   Introduction
Chapter 2:   Pre-Activity Screening
Appendix B: Forms

ACSM's Certification Review (3rd Edition): *The chapters in this text should serve as an outline for reviewing the material covered in this content area.*
Chapter 4:   Pathophysiology and Risk Factors
Chapter 5:   Human Behavior and Psychosocial Assessment
Chapter 6:   Heath Appraisal and Fitness Testing
Chapter 7:   Safety, Injury Prevention, and Emergency Care

BODY COMPOSITION, OBESITY, and WEIGHT CONTROL
RESOURCES:
ACSM's Guidelines (8th Edition):
Chapter 4:   Health-Related Physical Fitness Testing & Interpretation, pp. 60 - 70
Chapter 10:   Exercise Prescription for Other Clinical Populations, pp. 250 - 255

ACSM's Resource Manual (6th Edition):
Chapter 4:   Nutrition
Chapter 13:   Nutritional Status and Chronic Disease
Chapter 14:   Assessment of Nutritional Status
Chapter 17:   Body Composition Status and Assessment
Chapter 33:   Weight Management

ACSM's Health-Related Physical Fitness Manual (2nd Edition):
Chapter 4:   Body Composition

ACSM's Certification Review (3rd Edition): *The chapters in this text should serve as an outline for reviewing the material covered in this content area.*
Chapter 8:   Exercise Programming (Parts I – III)
Chapter 9:   Nutrition & Weight Management
Chapter 11:   Metabolic Calculations

CARDIORESPIRATORY FITNESS and EXERCISE TESTING
RESOURCES:
ACSM's Guidelines (8th Edition):
Chapter 4:   Health-Related Physical Fitness Testing and Interpretation
Chapter 5:   Clinical Exercise Testing
Chapter 6:   Interpretation of Clinical Exercise Test Data
Chapter 7:   General Principles of Exercise Prescription, pp. 152 – 165
Chapter 10:   Exercise Prescription for Other Clinical Populations, pp. 248 – 250, pp. 258 - 260

ACSM's Resource Manual (6th Edition):
Chapter 19:   Cardiorespiratory and Health-Related Physical Fitness Assessments
Chapter 21:   Clinical Exercise Testing Procedures
Chapter 34:   Exercise Prescription and Medical Considerations
Chapter 35:   Exercise Prescription in Patients with Cardiovascular Disease

ACSM's Health-Related Physical Fitness Manual (2nd Edition):
Chapter 7:   Cardiorespiratory Fitness Management
Chapter 8:   Laboratory Sub-Maximal Exercise Testing
Chapter 9:   Maximal Exercise Testing
Chapter 10:   Interpretation of Assessment Results

ACSM's Certification Review (3rd Edition): *The chapters in this text should serve as an outline for reviewing the material covered in this content area.*

Chapter 6:   Health Appraisal & Fitness Testing

MUSCULOSKELETAL HEALTH and FUNCTION
RESOURCES:
ACSM's Guidelines (8th Edition):

ACSM's Guidelines (8th Edition):
Chapter 4:   Health-Related Physical Fitness Testing & Interpretation, pp. 85 - 101
Chapter 7:   General Principles of Exercise Prescription, pp. 165 - 174
Chapter 10:   Exercise Prescription for Other Clinical Populations, pp. 225 – 227, 237 – 241, and 256 – 257

ACSM's Resource Manual (6th Edition):
Chapter 1:   Functional Anatomy
Chapter 2:   Biomechanics
Chapter 20:   Muscular Fitness and Assessment
Chapter 25:   Occupational and Functional Assessments
Chapter 29:   Musculoskeletal Exercise Prescription
Chapter 31:   Adaptations to Resistance Training
Chapter 39:   Exercise Prescription for People with Osteoporosis
Chapter 40:   Exercise Prescription for People with Arthritis

ACSM's Health-Related Physical Fitness Manual (2nd Edition):
Chapter 5:   Muscular Fitness: Muscular Strength, Endurance & Flexibility
Chapter 6:   Postural Analysis and Body Alignment

ACSM's Certification Review (3rd Edition): *The chapters in this text should serve as an outline for reviewing the material covered in this content area.*
Chapter 1:   Anatomy & Biomechanics
Chapter 6:   Health Appraisal & Fitness Testing (Part I)

CLINICAL EXERCISE TESTING AND ECG
RESOURCES:
ACSM's Guidelines (8th Edition):
Chapter 3:   Pre-Exercise Evaluation
Chapter 5:   Clinical Exercise Testing
Chapter 6:   Interpretation of Clinical Test Data
Appendix A: Common Medications
Appendix C: Electrocardiogram (ECG) Interpretation

ACSM's Resource Manual (6th Edition):
Chapter 18:   Pre-Exercise Testing Evaluation
Chapter 27:   Electrocardiography
Chapter 28:   Cardiorespiratory Exercise Prescription
Chapter 30:   Adaptations to Cardiorespiratory Exercise Training

ACSM's Health-Related Physical Fitness Manual (2nd Edition):
Chapter 3:   Resting and Exercise Blood Pressure and Heart Rate
Chapter 7:   Cardiorespiratory Fitness Management

ACSM's Certification Review (3rd Edition): *The chapters in this text should serve as an outline for reviewing the material covered in this content area.*

Chapter 6:   Health Appraisal & Fitness Testing (Section I: Pretest Considerations)
Chapter 12:   Electrocardiography

EXERCISE PRESCRIPTION

RESOURCES:

ACSM's Guidelines (8th Edition):

Chapter 7:   General Principles of Exercise Prescription
Chapter 8:   Exercise Prescription for healthy Populations and Special Considerations
Chapter 9:   Exercise Prescription for Patients with Cardiac Disease
Chapter 10:   Exercise Prescription for Other Clinical Populations

ACSM's Resource Manual (6th Edition): PRIMARY READINGS

Chapter 28: Cardiorespiratory Exercise Prescription
Chapter 29: Musculoskeletal Exercise Prescription
Chapter 42: Behavioral Strategies to Enhance Physical Activity Participation
Chapter 43: Principles of Health Behavior Change

ACSM's Resource Manual (6th Edition) BACKGROUND READING:

Chapter 30: Adaptations to Cardiorepsiratory Exercise Training
Chapter 31: Adaptations to Resistance Training
Chapter 41: Exercise Prescription in Special Populations: Women, Pregnancy, Children and the Elderly.

ACSM's Health-Related Physical Fitness Manual (2nd Edition):

Appendix A: Conversions

ACSM's Certification Review (3rd Edition): *The chapters in this text should serve as an outline for reviewing the material covered in this content area.*

Chapter 8:   Exercise Programming
Chapter 11:   Metabolic Calculations
Chapter 5:   Human Behavior and Psychosocial Assessment

KSAs FOR HFS CERTIFICATION EXAM (not covered in this course)

GPC: Exercise Prescription and Programming 1.7.4, 1.7.19, 1.7.22, 1.7.27, 1.7.34, 1.7.46
GPC: Program Administration, Quality Assurance, and Outcome Assessment 1.11.1 – 1.11.13 (ALL)
Immunologic: Pathophysiology and Risk Factors 7.2.1 (COMPLETE)

ACSM's Certification Review (3rd Edition): *The chapters listed below should serve as an outline for reviewing the remaining material.*

Chapter 8:   Exercise Programming
Chapter 10:   Program Administration/Management
Appendix B: Clinical Comprehensive Exam

Exercise Tech II Course Schedule   Fall 2010

August

Week 1	19	Introduction & Risk Assessment
Week 2	24	Pulmonary Function, Blood Pressure and Heart Rate
	26	Body Composition
Week 3	30	Cardiorepiratory Fitness

September

Week 3	2	Muscular Fitness
Week 4	7	Clinical Exercise Testing
	9	Clinical Exercise Testing
Week 5	14	Exercise Presripction
	16	Exercise Prescription
Week 6	21	Tiger*Fit* Clinical Exercise Testing - Practice
	23	Integrative Physiology Meeting – No class
Week 7	27	Tiger*Fit* Health and Fitness Appraisals
	29	Data Reduction & Interpretation

October

Week 8	4	Tiger*Fit* Health and Fitness Appraisals
	6	Data Reduction & Interpretation
Week 9	11	Tiger*Fit* Health and Fitness Appraisals
	13	Data Reduction & Interpretation
Week 10	18	Tiger*Fit* Health and Fitness Appraisals
	20	Data Reduction & Interpretation
Week 11	25	Tiger*Fit* Health and Fitness Appraisals
	27	Data Reduction & Interpretation

November

Week 12	1	Tiger*Fit* Health and Fitness Appraisals
	3	Data Reduction & Interpretation
Week 13	8	Tiger*Fit* Health and Fitness Appraisals
	10	Data Reduction & Interpretation
Week 14	15	Tiger*Fit* Health and Fitness Appraisals
	17	Data Reduction & Interpretation
Week 15	22	Thanksgiving Break
	24	Thanksgiving Break
Week 16	29	Tiger*Fit* Health and Fitness Appraisals

December

Week 16	1	Data Reduction & Interpretation