

Adv. Topics in Physiology of Exercise
KINE 4373
FALL 2017

Instructor: Rob Oviatt, CSCS, NCSA

Instructors email and phone #: 509 432-6362 roviatt@gmail.com

Course Format: Material will be presented online.

Catalogue Description: A detailed study of exercise testing and prescription for all age groups at every athletic level, including special needs and at-risk athletes. Exercise testing for optimal performance and wellness, demonstrations, a practical component, and review of the current literature are featured.

Required Text:

ISBN: 978-1-4925-0162-6 4th ed. Essentials of Strength Training and Conditioning, G. Gregory Haff and N. Travis Triplett. Human Kinetics Publishing.

*This is a new edition that just came out (2016). The 3rd edition (much cheaper) will work as well as the new addition.

Course Description: A detailed study of exercise testing and prescription that discusses the selection, administration, scoring, and implementation of testing results. Furthermore, there will be detailed discussion on the ways to design effective strength training and conditioning programs, both anaerobic and aerobically.

Course Objectives: The student will gain an understanding of exercise testing as it relates to selection, administration, scoring, and implementation. The student will also be able to design effective strength and conditioning programs for various populations

Grade Determination: Midterm Exam – (100 pts) Project – (100 pts) Final Exam – (100 pts) 10%, Quiz's – (100 pts) article reviews (50 pts.), (450 total points),

405 - 450 = A
360 - 404 = B
315 - 359 = C
270 - 314 = D
Below 240 = F

Assignments:

Quizzes: There will be 10 quizzes given throughout the semester. The quizzes will comprise of 10-20 m/c and or t/f questions from the materials covered in online assignments.

Project: Students will be assigned a project to complete during the semester. The project will be the development of sports specific training program. This sport will project details will be given to the student after three weeks of class.

Mid-Term and Final Exams: The Mid-Term exam will cover the first seven weeks of the semester. The final exam will **not** be comprehensive and will focus on information covered in the second half of the class. All exams will consist of multiple choice, true false, short answer, and essay type questions.

SPECIFIC COURSE OBJECTIVES

UNIT 1

Assignment 1: Introduction

Students will be able to:

- List organizations which certify performance professionals
- List job opportunities for performance professionals
- Discuss the duties of performance professionals
- Discuss the qualifications needed to be a performance professional.

Assignment 2: Bioenergetics of Exercise & Training (Ch. 2) Adaptations to Aerobic Endurance (Ch. 6)

Students will be able to:

- Discuss the central role of adenosine triphosphate (ATP) in muscular activity
- Recognize the substrates used by each energy system and discuss patterns of substrate depletion and repletion with various types of activities
- Identify and describe the impact of chronic aerobic endurance training on the physiological characteristics of the cardiovascular, respiratory, nervous, muscular, bone and connective tissue, and endocrine systems
- Recognize the interacting between designing aerobic endurance training programs and optimizing physiological responses of all body systems
- Identify and describe the acute responses of the cardiovascular and respiratory systems to aerobic exercise

Assignment 3: Aerobic Endurance Exercise Training (Ch.18)

Students will be able to:

- Discuss the factors related to aerobic endurance performance
- Set aerobic endurance training frequency based on training status, sport session, and recovery requirements
- Apply the program design variables based on the sport season

- Describe the various types of aerobic endurance programs
- Address the issues of cross-training, detraining, tapering, and supplemental resistance training when designing an aerobic endurance training program

Assignment 4: Endocrine Responses to Resistance Exercise (Ch.3)
Biomechanics of Resistance Exercise (Ch.4)

Students will be able to:

- Understand basic concepts of endocrinology, including what hormones are and how they interact with each other and target tissues
- Explain the physiological roles of anabolic hormones
- Analyze sport movements and design movement-oriented exercise prescriptions
- Describe the factors contributing to human strength and power
- Describe the factors contributing to human power and strength

Assignment 5: Adaptations to Anaerobic Training Programs (Ch.5)

Students will be able to:

- Discuss the ways in which force output of a muscle can be increased
- Recognize the causes, signs, symptoms, and effects of overtraining and detraining
- Discuss the potential for enhancement of muscle strength, muscular endurance, power, flexibility, and motor performance during anaerobic training
- Explain the responses of bone, muscle, and connective tissue to anaerobic training

Assignment 6: Age / Sex Related Differences for Resistance (Ch.7)
Performance-Enhancing Substances (Ch. 9)

Students will be able to:

- Discuss sex-related differences in muscular function and their implication for female athletes
- Describe the effects of aging on musculoskeletal health and comment on the trainability of older adults
- Explain why adaptations to resistance exercise can vary greatly among participants
- Provide reliable information to athletes on the risks and benefits of performance-enhancing substances, including anabolic steroids
- Evaluate advertising claims for over-the-counter supplements marketed for performance benefits

Assignment 7: Principles of Test Selection & Administration (Chapter 11)
Administration, Scoring, Interpretation of Selected Tests (Chapter 12)

Students will be able to:

- Identify and explain reasons for performing tests
- Understand testing terminology to communicate clearly with athletes and colleagues
- Evaluate a test's validity and reliability
- Understand appropriate statistics
- Combine the results of selected tests to generate an athletic profile
-

Assignment 8: Mid-Term

UNIT 2

Assignment 1: Warm-Up & Stretching (Ch.13)

Functional Movement Screen (Hand-Out)

Students will be able to:

- Select and apply appropriate static and dynamic stretching methods
- Describe flexibility exercises that take advantage of proprioceptive neuromuscular facilitation
- Explain the mechanisms that cause the muscular inhibition that improves the stretch

Assignment 2: Speed, Agility, & Speed-Endurance Development (Ch.17) Plyometrics (Ch.16)

Students will be able to:

- Explain the physiology of plyometric exercise
- Design a safe and effective plyometric training program
- Identify the phases of the stretch-shortening cycle
- Apply sound movement principles to locomotion modes and techniques and teach their correct execution
- Analyze the abilities and skills needed in specific movement tasks

Assignment 3: Resistance Training (Ch.15) Periodization (Ch.19)

Students will be able to:

- Select exercises based on type, sport specificity, technique experience, equipment availability, and time availability
- Know how much an exercise load should be increased
- Determine rest period lengths based on the training goal
- Describe the four periods of the traditional periodization model
- Relate the four sport seasons to the four periods of the traditional periodization model
- Understand the value, roll, and application of periodization in strength and conditioning programs

Assignment 4: Resistance Training & Spotting Techniques (Ch.14)

Students will be able to:

- Provide breathing guidelines
- Determine the appropriations of wearing a weight belt
- Provide recommendations for spotting free weight exercises

Assignment 5: Facility Organization & Risk Management (Ch. 21) Developing a 'Policies and Procedures Manual' (Ch. 22)

Students will be able to:

- Identify common areas of potential litigation in the strength and conditioning facility

- Identify key aspects of facility and equipment maintenance and cleaning, and implement appropriate maintenance and cleaning schedules
- Identify the four phases and specific components of planning and designing a strength and conditioning facility
- Identify key elements for assessing space requirements and equipment needs in the strength and conditioning facility
- Develop or clarify the goals and objectives of a strength and conditioning program
- Ultimately create a policies and procedures manual for a strength and conditioning facility

Assignment 14: Project completion

Assignment 15: Final

It is the student's responsibility to check their university student email account. This is an official form of communication. It is recommended that the account is checked daily.

Student absences on religious holy days policy (AP 861001):

Section 51.911(b) of the Texas Education Code requires that an institution of higher education excuse a student from attending classes or other required activities, including examinations, for the observance of a religious holy day, including travel for that purpose. A student whose absence is excused under this subsection may not be penalized for that absence and shall be allowed to take an examination or complete an assignment from which the student is excused within a reasonable time after the absence.

University policy 861001 provides the procedures to be followed by the student and instructor. A student desiring to absent himself/herself from a scheduled class in order to observe (a) religious holy day(s) shall present to each instructor involved a written statement concerning the religious holy day(s). This request must be made in the first fifteen days of the semester or the first seven days of a summer session in which the absence(s) will occur. The instructor will complete a form notifying the student of a reasonable timeframe in which the missed assignments and/or examinations are to be completed.

<http://www.shsu.edu/dotAsset/0953c7d0-7c04-4b29-a3fc-3bf0738e87d8.pdf>

Student Absence Notification Policy (Dean of Students)

Distinction between non-emergency and emergency absences; included in this link is the Absence Notification Request Form: <http://www.shsu.edu/dept/dean-of-students/absence.html>

Procedures in Cases of Academic Dishonesty (AP 810213)

Students are expected to engage in all academic pursuits in a manner that is above reproach. Students are expected to maintain honesty and integrity in the academic experiences both in and out of the classroom. Any student found guilty of dishonesty in any phase of academic work will be subject to disciplinary action. The University and its official representatives may initiate disciplinary proceedings against a student accused of any form of academic dishonesty including but not limited to, cheating on an examination or other academic work which is to be submitted, plagiarism, collusion and the abuse of resource materials.

<http://www.shsu.edu/dotAsset/728eec25-f780-4dcf-932c-03d68cade002.pdf>

Allegations of student misconduct, as defined in paragraph 5.2, Chapter VI of the *Rules and Regulations*, Board of Regents, The Texas State University System, and Sam Houston State University *Student*

Guidelines, published by the Dean of Students' Office, will be referred to the Dean of Students' Office for necessary action. Dean of Students: <http://www.shsu.edu/dept/dean-of-students/>.

Academic Honesty:

Academic honesty is expected in all work. Ignorance is not an excuse. Penalties will include 0 points for the assignment or exam and loss of any extra credit opportunities. First instance will result in a 0 on the assignment and the incident being noted. Second instance will result in failing the class, and both incidents will be reported. Remember that self-plagiarism (using something you did) is also considered academic dishonesty.

The subject of academic honesty is addressed in paragraph 5.3, Chapter VI, of the *Rules and Regulations*, Board of Regents, The Texas State University System, and Sam Houston State University *Student Guidelines* published by the Office of Student Life to wit:

5.3 Academic Honesty. The University expects all students to engage in all academic pursuits in a manner that is above reproach. Students are expected to maintain complete honesty and integrity in the academic experiences both in and out of the classroom. Any student found guilty of dishonesty in any phase of academic work will be subject to disciplinary action.

5.31 The University and its official representatives, acting in accordance with Subsection 5.32, may initiate disciplinary proceedings against a student accused of any form of academic dishonesty including, but not limited to, cheating, plagiarism, collusion, and the abuse of resource materials.

"Cheating" includes the following and similar actions:

- (1) Copying from another student's test paper, laboratory report, other report, or computer files, data listings, and/or programs.
- (2) Using, during a test, materials not authorized by the person giving the test.
- (3) Collaborating, without authorization, with another student during an examination or in preparing academic work.
- (4) Knowingly, and without authorization, using, buying, selling, stealing, transporting, soliciting, copying, or possessing, in whole or in part, the contents of an unadministered test.
- (5) Substituting for another student, permitting any other person, or otherwise assisting any other person to substitute for oneself or for another student in the taking of an examination or test or the preparation of academic work to be submitted for academic credit.
- (6) Bribing another person to obtain an unadministered test or information about an unadministered test.
- (7) Purchasing, or otherwise acquiring and submitting as one's own work any research paper or other writing assignment prepared by an individual or firm. This section does not apply to the typing of the rough and/or final versions of an assignment by a professional typist.

5.32 "Plagiarism" means the appropriation and the unacknowledged incorporation of another's work or idea into one's own work offered for credit.

5.33 "Collusion" means the unauthorized collaboration with another person in preparing work offered for credit.

5.34 "Abuse of resource materials" means the mutilation, destruction, concealment, theft or alteration of materials provided to assist students in the mastery of course materials.

5.35 "Academic work" means the preparation of an essay, dissertation, thesis, report, problem, assignment, or other project that the student submits as a course requirement or for a grade.

"Self-plagiarism represents a significant problem in academia as it serves to undermine the learning process and outcomes that are a key feature of each course that is offered as a part of a student's curriculum. As a result, the Department of Health and Kinesiology has a strict policy in place to prevent self-plagiarism in the classroom. Self-plagiarism is defined as the submission of any type of assignment that contains content that is recycled from other assignments or a prior publication that one submits for course credit in another course."

Academic Grievance Procedures for Students (AP 900823)

Academic grievances include disputes over course grades, unauthorized class absences/tardiness, suspension for academic deficiency, instructor's alleged unprofessional conduct related to academic matters, graduate comprehensive and oral exams, theses and dissertations, and withdrawal or suspension of privileges related to degree-required clinical rotation, internships, or other clinical service delivery in professional degree programs.

If the dispute is determined to be based upon professional judgment, the aggrieved student is entitled to have, as appropriate and in turn, the department/school chair, College Academic Review Panel, academic dean, Dean of Graduate Studies (for graduate student issues), and Provost and Vice President for Academic Affairs form an opinion about the dispute and so advise the individual(s) involved.

<http://www.shsu.edu/dotAsset/0bb1346f-b8d6-4486-9290-dba24123d0d8.pdf>

Students with disabilities policy (AP 811006):

It is the policy of Sam Houston State University that individuals otherwise qualified shall not be excluded, solely by reason of their disability, from participation in any academic program of the university. Further, they shall not be denied the benefits of these programs nor shall they be subjected to discrimination. Any student with a disability that affects his/her academic performance should contact the Office of Services for Students with Disabilities in the SHSU Lee Drain Annex (telephone 936-294-3512, TDD 936-294-3786) to request accommodations. They should then make arrangements with their individual instructors so that appropriate strategies can be considered and helpful procedures can be developed to ensure that participation and achievement opportunities are not impaired.

SHSU adheres to all applicable federal, state, and local laws, regulations, and guidelines with respect to providing reasonable accommodations for students with disabilities. NOTE: No accommodation can be made until a student registers with the Services for Students with Disabilities

<http://www.shsu.edu/dotAsset/187f9029-a4c6-4fb4-aea9-2d501f2a60f3.pdf>

Additional Resources:

All SHSU Policies: <http://www.shsu.edu/intranet/policies/>

Student Guidelines <http://www.shsu.edu/students/guide/>