

San José State University
Department of Kinesiology

KIN 155 - Exercise Physiology: Lecture Section 01; Lab Sections 02, 03, 04, 05

Course and Contact Information

Instructor:	Dr. Craig J. Cisar, Ph.D., FACSM, ACSM ETT, CSCS, NSCA-CPT
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Office Hours:	TTh 09:45-11:15 and by appointment
Class Days/Time:	Lecture MW 09:30-10:20; Lab MTWTH 07:30-09:20
Classroom:	Lecture YuH 124; Lab YuH 233
Prerequisites:	BIO 66 - Human Physiology; CHEM 30A or higher; GE Math or higher; and KIN 70 - Introduction to Kinesiology

Course Format

Course Description

Physiological responses and adaptations of the human organism to physical activity.

Course Goals

Undergraduate Degree Program Learning Outcomes (PLO)

At the end of a Bachelor of Science degree program in the Department of Kinesiology students will be able to:

1. explain, identify, and/or demonstrate the theoretical and/or scientific principles that can be used to address issues or problems in the sub-disciplines in kinesiology.
2. effectively communicate in writing (clear, concise and coherent) on topics in kinesiology.
3. effectively communicate through an oral presentation (clear, concise and coherent) on topics in kinesiology.
4. utilize their experiences across a variety of health related and skill-based activities to inform their scholarship and practice in the sub disciplines in kinesiology.
5. Students will be able to identify and analyze social justice and equity issues related to kinesiology for diverse populations.

Course Learning Outcomes

Course Objectives

Following successful completion of this course, students will be able to:

1. identify and explain the basic physiological responses and training adaptations to physical activity (PLO #1 and #4).
2. analyze and identify the physiological requirements of sports and physical activities (PLO #1 and #4).
3. identify and explain various physiological factors limiting performance of various sports and physical activities (PLO #1 and #4).

4. sensitively identify and explain age, gender, cultural, and other individual differences that may exist in physiological responses, training adaptations, and performance capabilities in various sports and physical activities (PLO #1 and #5).
5. identify and explain the basic components of conditioning programs designed to improve performance and promote health enhancement (PLO #1 and #4).
6. identify and describe equipment used to measure and evaluate various physiological aspects of human performance (PLO #1 and #4).
7. collect, analyze, and interpret physiological data collected from various laboratory tests and procedures (PLO #1 and #2).

Required Texts/Readings (Required)

Cisar, C.J., Thorland, W.J., & Christensen, C.L. (2018). Physiology of exercise notebook. San Jose, CA: Maple Press (available at Maple Press, 333 South 10th Street).

Other technology requirements / equipment / material

Calculator

Course Requirements and Assignments

Lecture examinations will cover lecture materials and related assigned readings (SLO #3). Laboratory examinations will cover the conceptual and technical aspects of the material presented in the laboratory sessions and related laboratory materials (SLO #6). All examinations will be conducted as closed textbook and notebook. Both the lecture and laboratory examinations will be objective examinations consisting of multiple choice, matching, and/or true-false questions; the examinations may involve calculations. **EXAMINATIONS WILL BE GIVEN AT THE SCHEDULED TIME ONLY AND NO MAKE-UP EXAMINATIONS WILL BE GIVEN**, except for dire and serious illnesses. If this should occur, the instructor must be notified personally PRIOR to the examination. Students should be aware that more than a superficial understanding of concepts will be necessary in order to apply the information given in class and related readings to situations presented in examination questions. Students will have the opportunity to earn additional points through participation in laboratory activities and completion of laboratory assignments (SLO #1 and #6). The maximum additional points that can be earned are 5 points. Laboratory assignments will not be accepted late.

The [University Policy S16-9](#), Course Syllabi (<http://www.sjsu.edu/senate/docs/S16-9.pdf>) requires the following language to be included in the syllabus:

“Success in this course is based on the expectation that students will spend, for each unit of credit, a minimum of 45 hours over the length of the course (normally three hours per unit per week) for instruction, preparation/studying, or course related activities, including but not limited to internships, labs, and clinical practica. Other course structures will have equivalent workload expectations as described in the syllabus.”

Final Examination or Evaluation

The final examination in the course will be held on Friday, December 14th 2018 from 0715-0930.

Grading Information

Determination of Grades

Grades will be based solely on accumulated points from the examinations and application paper with total points allocated in the following manner.

	<u>Points</u>
Two Lecture Examinations - 30 Points Each (PLO #1, #4, and #5)	60
Two Lab Examinations - 20 Points Each (PLO #1, #4, and #5)	<u>40</u>
Subtotal	100
Laboratory Participation and Assignments (PLO #1, #2, and #5)	<u>5</u>
Total	

Final grades will be assigned according to the following allocation of total points.

A+	98-105	B+	88-89	C+	78-79	D+	68-69	F	≤ 59
A	92-97	B	82-87	C	72-77	D	62-67		
A-	90-91	B-	80-81	C-	70-71	D-	60-61		

Classroom Protocol

1. Students are responsible for information presented in lectures and laboratory sessions, whether present or not. In addition, students are responsible for material presented in the assigned readings.
2. Active participation in the laboratory sessions is expected. Laboratory sessions are designed to supplement the lecture material. Laboratory sessions will consist of data collection, data analysis, and discussion of the results obtained during the laboratory sessions. Students are expected to study the data collected and answer questions during and at the end of each lab. This material will then be covered on lab exams.

University Policies

1. ACADEMIC INTEGRITY (from Office of Judicial Affairs). "Your own commitment to learning, as evidenced by your enrollment at San Jose State University, and the University's Academic Integrity Policy requires you to be honest in all your academic course work. Faculty are required to report all infractions to the office of Judicial Affairs. The policy on academic integrity can be found at <http://www2.sjsu.edu/senate/S04-12.htm>.
2. AMERICANS WITH DISABILITIES ACT COMPLIANCE. If you need course adaptations or accommodations because of a disability, or if you need special arrangements in case the building must be evacuated, please make an appointment with the Accessible Education Center (924-6000, located in Adm 110) as soon as possible. Presidential Directive 97-03 requires that students with disabilities register with the Accessible Education Center to establish a record of their disability.

Tentative Schedule of Lecture Topics and Examinations

Introduction
Central and Peripheral Nervous System Control of Movement
Contractile Model
Muscle Fiber Type Variations and Properties
Three Basic Principles of Exercise Physiology
Motor Unit Response Characteristics
Determinants of Force Production
Influences on Speed of Movement
Effects of Muscular Fatigue on Force Production and Training Influences on Contractile-Related Factors
Phosphagen Metabolism and Glycolytic Metabolism
Oxidative Metabolism - Krebs Cycle and Electron Transport System
Energy System Characteristics and Energy Yield from Carbohydrate and Fat Metabolism
Beta Oxidation of Fatty Acids
Metabolic Response to Exercise
Free Fatty Acid Mobilization
Carbohydrate Loading and Replenishment Fluids and Other Ergogenic Aids
Muscle Histological and Biochemical Adaptations from Training

First Lecture Examination – Monday, October 15th

Pulmonary, Metabolic, Cardiac, and Motor Unit Recruitment Responses to Exercise
Effects of Respiratory Rate and Depth on Alveolar Ventilation Rate
Gas Exchange and Pulmonary Diffusion
Plasma and Hemoglobin Transport of Oxygen
Hemoglobin-Oxygen Dissociation Curve
Circulatory and Cardiac Responses to Exercise
Submaximal and Maximal Oxygen Uptake Rate
Influences on Cardiorespiratory Responses to Exercise
Carbon Dioxide Transport
Lactic Production and Buffering During Exercise
Anaerobic Threshold
Cardiorespiratory and Metabolic Training Adaptations
Review of Oxygen Uptake Rate Responses to Exercise
Influence of Exercise on Growth, Aging, Coronary Heart Disease, and Other Causes of Death
Fundamental Concepts Underlying Training Programs
Metabolic Contributions to Energy Requirements
Review of Oxygen Deficit and Debt Concepts
Effects of Different Pacing Strategies on Oxygen Uptake Rate and Oxygen Deficit
Factors Affecting Oxygen Debt and Rate of Recovery from Exercise
Performance and Training Implications
Interval Training Guidelines and Endurance Training Guidelines
Concepts Related to Strength Training, Strength Training Guidelines, and Muscle Soreness
Muscle Mass and Strength Development Trends
Review of Gender Differences in Age Trends of Body Composition
Review of Training Adaptations

Second Lecture Examination – Friday, December 14th, 0715-0930

Tentative Laboratory Topics and Examinations

<u>Week</u>	<u>Dates</u>	<u>Lab #</u>	<u>Topics/Examinations</u>
1	8-21/22/23		No Labs
2	8-27/28/29/30	1	Characteristics of Muscular Strength and Contractile Responses: Electromyography Responses
3	9-3/4/5/6		No Labs
3	9-5/6/7/11	2	Characteristics of Muscular Strength and Contractile Responses: Isokinetic Responses
4	9-10/11/12/13	3	Anaerobic Work Indices
5	9-17/18/19/20	4	Determination of Resting Metabolic Rate by Open Circuit Calorimetry and Energy Expenditure
		6	Cardiorespiratory and Metabolic Responses During Submaximal Exercise and Recovery
6	9-24/25/26/27	5	Determination of Heart Rate and Blood Pressure Basic Interpretation of Electrocardiograms
7	10-1/2/3/4		First Lab Examination
8	10-8/9/10/11	7	Determination of Maximal Oxygen Uptake Rate and Anaerobic Threshold
9	10-15/16/17/18	8	Determination of Maximal Oxygen Uptake Rate and Anaerobic Threshold
10	10-22/23/24/25	8	Submaximal Leg Ergometer Test for Determination of Maximal Oxygen Uptake Rate
11	10-29/30/31 & 11-1	9	Pulmonary Function Testing
12	11-5/6/7/8	10	Body Composition – Underwater weighing and Bioelectrical Impedance
13	11-13/14/15//19	11	Anthropometric Determination of Body Composition
14	11-20/21/22/23		No Labs
15	11-26/27/28/29	12	Anthropometric Determination of Body Build Characteristics
16	12-3/4/5/6		Second Lab Examination
17	12-11		No Lab

