San José State University
Department of Kinesiology
KIN 155 – Exercise Physiology,
Lecture Section 01 and Lab Sections 02, 03, 04, 05, and 06
Fall, 2024

Course and Contact Information

Instructor:	Craig J. Cisar, Ph.D., FACSM, ACSM ETT, CSCS, NSCA-CPT
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Office Hours:	MW 11:00-11:30 and 2:00-2:30, T 9:30-10:30, and by appointment
Class Days/Time:	Lecture MW 10:00-10:50 Labs MW 7:30-9:20 and 12:00-1:50, and T 7:30-9:20
Classroom:	Lecture YuH 124; Labs YuH 233
Prerequisites:	KIN 70 – Introduction to Kinesiology, BIOL 66 – Human Physiology, GE CHEM 30A – Introductory Chemistry or higher, and GE math or higher

Course Description

Exercise physiology examines the physiological responses and adaptations of the human organism to physical activity. Considerable emphasis is given toward understanding how the body functions during exercise and adapts to long-term training. Topics related to neuromuscular physiology, bioenergetics, cardiorespiratory physiology, circulation, neuroendocrinology, and cellular developmental traits will be presented and interrelated. In addition, the physiological effects of factors such as age, gender, body composition, and the environment on human performance will be discussed. Lectures and discussions will focus on applying the information from these topics into a framework for conditioning programs designed to improve performance and promote health enhancement.

Undergraduate 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. identify and analyze social justice and equity issues related to kinesiology for diverse populations.

Course Learning Objectives

Upon 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

Other Readings

Cisar, C.J., Thorland, W.J., & Christensen, C.L. (2023). *Exercise Physiology*. San Jose, CA: Maple Press (available at Maple Press, 330 South 10th Street, San Jose, CA).

Other technology requirements / equipment / material

Computer with printer/scanner, calculator, cell phone and metric ruler.

Course Requirements and Assignments (Required)

1. This course is an in-person course. Lectures will meet in YuH 124 on MW from 9:30-10:20 AM and labs will meet in YuH 233 from 7:30-9:20 AM (M, T, and W) and 12:30-14:20 PM (M and W). Lab information and material are designed to supplement the lecture information and material. Students are responsible for information presented in lecture and lab sessions. Lecture and lab presentation notes will also be sent to you via email to the email address that was used to enroll in the course. Check your email regularly for incoming lecture and lab information and material. Communication with the instructor can best be accomplished via email. Please email the instructor directly at craig.cisar@sjsu.edu with all questions and concerns rather than replying to group emails sent to all students in the course.
2. Lecture exams will cover lecture information and materials. Lab exams will cover lab information and material. The second lecture and lab exams are not cumulative. All exams will be conducted as individual effort open book exams. Both the lecture and laboratory exams will be objective exams consisting of multiple choice, matching, and/or true-false questions; the exams may involve calculations. You will need a large blue and white T&E 0200 General All Purpose Answer Sheet (scantron) for each exam, which are available at the Student Union Bookstore. **EXAMS WILL BE GIVEN AT THE SCHEDULED TIME ONLY AND NO MAKE-UP EXAMS WILL BE GIVEN,** except for dire and serious illnesses. If this occurs, the instructor must be notified personally PRIOR to the exam. 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 the exam questions.
3. Active learning credit can be earned by completing lab reports, volunteering for lab demonstrations, and possibly other activities during lab sessions. The maximum extra credit active learning participation that can be earned is 5 points, which will be added to your final total points earned on exams at the end of the semester when final grades are determined.

"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 lecture examination will be on Tuesday, December 17th, from 7:15-930 AM in YuH 124.

Grading Policy

Grading Requirements

Grades will be based solely on accumulated points from the examinations and active learning extra credit with total points allocated in the following manner.

	Points
Two Lecture Examinations - 30 Points Each (PLO #1, #4, and #5)	60
Two Lab Examinations - 20 Points Each (PLO #1, #4, and #5)	40
Active Learning Credit (PLO #2 and #4)	5
Total	105

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

A+	98-100	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		

SJSU Department of Kinesiology Diversity, Equity. and Inclusion Statement

The Department of Kinesiology is committed to developing and implementing equitable curricula and teaching practices that reflect the diversity of our student body and departmental core values. The faculty strives to foster an inclusive learning environment where all students feel valued, supported, welcomed, and empowered to succeed in ALL classes. All students, inclusive of all, but not limited to ethnicities, socioeconomic and cultural backgrounds, gender identities and expressions, castes, religions, ages, sexual orientations, abilities, bodies, political affiliations, statuses, and nationalities, are encouraged to share their rich array of perspectives and experiences. KIN department faculty, staff, and students all have something of value to contribute. Everyone is expected to respect differences and demonstrate diligence in understanding how others' perspectives, behaviors, and views may be different from theirs.

Classroom Protocol

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. Active participation in the laboratory sessions is expected. No cell phone use is allowed in class except for learning/educational purposes, such as audiotaping and/or videotaping of lecture and lab presentations.

University Policies

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.

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.

KIN 155 – Exercise Physiology, Fall 2022, Tentative Course Schedule

Tentative Schedule of Lecture Topics and Exams

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

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First Lecture Exam During Your Regularly Scheduled Lab Day and Time - 10-14/15/16

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

Final/Second Lecture Examination – Tuesday, December 17th from 7:15-9:30 AM in YuH 124

Week	Dates	Lab #	Topics/Examinations
1	8-21		No Labs
2	8-26/27/28	1	Characteristics of Muscular Strength and Contractile Responses: Electromyography Responses
3	9-2/3/4		No Labs This Week Due to Labor Day
4	9-9/10/11	2	Characteristics of Muscular Strength and Contractile Responses: Isokinetic Responses
5	9-16/17/18	3	Anaerobic Work Indices
6	9-23/24/25	4	Determination of Resting Metabolic Rate by Open Circuit Calorimetry and Energy Expenditure
		6	Cardiorespiratory and Metabolic Responses During Submaximal Exercise and Recovery
7	9-30 & 10-1/2	5	Determination of Heart Rate and Blood Pressure Basic Interpretation of Electrocardiograms
8	**10-7/8/9**		**First Lab Examination**
9	**10-14/15/16**	7	Determination of Maximal Oxygen Uptake Rate and Anaerobic Threshold (1st 40 Minutes of Lab Time) **First Lecture Examination (Last 70 Minutes of Lab Time)**
10	10-21/22/23	8	Submaximal Leg Ergometer Test for Determination of Maximal Oxygen Uptake Rate
11	10-28/29/30	9	Pulmonary Function Testing
12	11-6/7/8	10	Body Composition – Underwater weighing and Bioelectrical Impedance
13	11-11		No Lab Due to Veterans Day
	11-12/13	11	Anthropometric Determination of Body Composition
14	11-18	11	Anthropometric Determination of Body Composition
	11-19/20	12	Anthropometric Determination of Body Build Characteristics
15	11-25	12	Anthropometric Determination of Body Build Characteristics
	11-26/27		No Labs Due to Thanksgiving
16	**12-2/3/4**		**Second Lab Examination**
17	12-9		No Labs
18	**12-17**		**Second Lecture Exam 7:15-9:30 AM in YuH 124**