

**San José State University
CASA/Department of Kinesiology**

**KIN 154B – ECG Interpretations & Graded Exercise Testing
Sections 1 & 2 – Spring 2015**

Course and Contact Information

Instructor:	Peggy Plato, Ph.D.
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Office Hours:	T 2:00-4:00 pm; other times available by appointment
Class Days/Time:	TR 11:30 am–1:20 pm
Classroom:	YUH 233
Prerequisites:	KIN 70 & KIN 155 with grades of C- or better, Human Physiology, Introductory Chemistry, GE Math Current CPR certification – completed before end of semester (hands-on training with card required)

Course Format

This is a lecture-laboratory course. The lecture is scheduled from 11:30-12:20 and the laboratory from 12:30-1:20; however, the lecture will be longer on some days with less laboratory time. Other days, the lecture will be very short with primarily laboratory activities.

Course Description

Theoretical background and practical proficiency in the methods and instruments of electrocardiogram (ECG) interpretation and graded exercise testing (GXT).

Goals and Learning Outcomes

Kinesiology Undergraduate Major Program Learning Outcomes (KIN PLOs)

At the end of a Bachelor of Science degree program in the Department of Kinesiology, students should expect:

- (1) to obtain a critical understanding and the ability to apply theoretical and scientific knowledge from the subdisciplines in kinesiology for personal fitness, healthy lifestyles, sport, and/or therapeutic rehabilitation.
- (2) to effectively communicate the essential theories, scientific applications, and ethical considerations related to kinesiology.
- (3) to apply scholarship and practice of different movement forms to enhance movement competence in kinesiology.
- (4) to recognize and apply sustainable approaches as they relate to kinesiology.
- (5) to identify social justice and equity issues related to kinesiology for various populations.

Course-Specific Learning Outcomes (CLOs)

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

- CLO 1 demonstrate knowledge of cardiac anatomy and physiology.
- CLO 2 demonstrate knowledge and proficiency in ECG interpretation, including identification of dysrhythmias, and AV and bundle branch blocks.
- CLO 3 demonstrate understanding of the effects that axis changes of depolarization; hypertrophy of the heart; and myocardial ischemia, injury, and infarctions have on the ECG.
- CLO 4 understand and apply guidelines for evaluation of health status prior to GXT and exercise programming, including identifying abnormalities and conditions that are contraindications for GXT and/or exercise.
- CLO 5 demonstrate understanding of the benefits and risks associated with exercise, and legal issues related to exercise testing and programming.
- CLO 6 identify and describe safe endpoints for GXTs.
- CLO 7 understand and identify normal and abnormal GXTs, as well as false positive and false negative tests.
- CLO 8 demonstrate knowledge and proficiency in graded exercise testing methods, instrumentation, and protocols.
- CLO 9 demonstrate an understanding of (and proficiency in) emergency medical procedures that may be necessary during a GXT or exercise session.
- CLO 10 demonstrate an understanding of how data from a GXT reflect current physiological functioning and may be used in exercise programming for healthy individuals.
- CLO 11 demonstrate the ability to explain and interpret ECG and GXT results.
- CLO 12 compare/contrast clinical exercise testing with GXT procedures learned in class.
- CLO 13 demonstrate sensitivity to age, gender, cultural, and other individual differences that may affect the ECG, GXT, and exercise programming.

Required Materials

Textbooks:

Pescatello, L. S. (Ed.). (2014). *ACSM's guidelines for exercise testing and prescription* (9th ed.). Philadelphia: Wolters Kluwer/Lippincott Williams & Wilkins.

Wesley, K. (2011). *Huszar's basic dysrhythmias and acute coronary syndromes: Interpretation and management* (4th ed.). St. Louis: Elsevier Mosby JEMS.

Course Reader: After classroom delivery, available at Maple Press (481 E. San Carlos, 408-297-1000)

Other Materials:

Calculator

Metric ruler

ECG calipers (optional)

Course Requirements and Assignments

SJSU classes are designed such that in order to be successful, it is expected that students will spend a minimum of 45 hours for each unit of credit (normally 3 hours per unit per week), including preparing for class, participating in course activities, completing assignments, and so on. More details about student workload can be found in [University Policy S12-3](http://www.sjsu.edu/senate/docs/S12-3) at <http://www.sjsu.edu/senate/docs/S12-3.pdf>.

Grading Policy

Evaluation

	CLO	KIN PLO	Weighting
Clinical Assignment*	12, 13	1, 2	7%
Self-Assessment: Resting & Sub-Maximal Exercise*	2, 4, 11	1, 2, 3	6%
Self-Assessment: GXT*	2, 11	1, 2, 3	7%
Exercise Programming Case Study*	10, 13	1, 2	3%
Client Assessment*	2, 4, 10, 11, 13	1, 2	12%
Competency Tests*	8	1, 2	10%
GXT Tasks*	8	1, 2	3%
Competency Administering Client Assessment*	6, 8	1, 2	4%
Quizzes	1-7, 11	1	16%
Midterm Exam – Thurs., March 12	1-7, 11	1	16%
Final Exam (comprehensive) Fri., May 15, 9:45-12:00	1-7, 9, 11	1	16%

* Instructions and data sheets are in the course reader.

Written Projects (Clinical Assignment, Self-Assessments, Client Assessment, Exercise Programming Case Study)

Guidelines for projects are in the course reader. Written work, other than data sheets, must be typed, double spaced, and proofread. (Check for grammar, spelling, and syntax -- if in doubt, look it up!) Grades will be lowered for late assignments as follows:

Due Date	Received	Grade Lowered
Tuesday	After class Tues. through Wed.	1 grade step (e.g., A minus to B plus)
	Thurs. or Fri.	2 grade steps (e.g., A minus to B)
	Following Mon. or Tues.	1 full grade (e.g., A minus to B minus)
Thursday	After class Thurs. through Fri.	1 grade step
	Mon. or Tues.	2 grade steps
	Following Wed. or Thurs.	1 full grade
Students must speak with the instructor regarding assignments that are more than 1 week late.		

Competency Tests

Students will demonstrate proficiency in the following:

- Measuring resting blood pressure
- Measuring blood pressure during leg (cycle) ergometry
- Measuring blood pressure during treadmill walking
- 12-lead ECG electrode placement
- Calibration of treadmill speed and elevation
- Calibration of Monark bicycle ergometer

Grading on competency tests: A (95%) = excellent technique
B (85%) = good technique, minor corrections needed
F (50%) = poor or weak technique, significant errors, questionable data
0 pts = did not attempt competency

Students receiving less than an A grade will receive feedback about errors and may, after further practice, re-attempt the competency on another day. If a student does not attempt a competency by the first deadline date, the grade may be lowered one letter grade for each week, or part of a week, that the deadline is missed.

Students are responsible for scheduling competency tests during the lab by signing up on the whiteboard when ready to perform the competency. Thurs., May 7 is the last day to complete competency testing.

GXT Tasks

Students will be signed off after competently completing each of the following tasks:

- Administering GXT (start to finish)
- Operating metabolic cart
- Prepping client for testing, including ECG
- Obtaining blood pressure during exercise testing
- Obtaining RPE during exercise testing

Grading on GXT Tasks: 5 tasks completed = 3.0 points
 4 tasks completed = 2.5 points
 3 tasks completed = 2.0 points
 2 tasks completed = 1.5 points
 1 tasks completed = 1.0 points
 0 tasks completed = 0 points

Competency Administering Client Assessment

Students will demonstrate proficiency in administering their clients' GXTs, including:

(a) evaluating medical history prior to assessment day, (b) providing instructions to client and obtaining informed consent, (c) prepping client for testing, (d) obtaining resting measurements, (e) deciding on protocol prior to assessment day, (f) obtaining appropriate measurements during GXT, (g) supervising cool down, (h) administering GXT in a safe and efficient manner, and (i) leaving laboratory and equipment clean after GXT.

Quizzes

Quizzes will cover lecture and reading material. A scantron 815E and #2 pencil are required for each quiz. The lowest quiz score will be dropped. In most cases, make-up quizzes will not be permitted; however, decisions will be made on an individual basis with advance notification. If a make-up is permitted, it must be completed before the next class meeting.

Midterm & Final Exams

A scantron 882E and #2 pencil are required for the midterm and final exams. Exams may include true-false, multiple choice, matching, and short answer questions and problems. Exams are to be taken on the dates scheduled. The final exam will NOT be given early. Make-up exams are permitted only for illness and emergency (TRULY EXTRAORDINARY CIRCUMSTANCES). The student is responsible for notifying the instructor and making arrangements at the earliest possible

time. In most cases, the exam must be completed before the next class meeting. All requests for make-up exams will be evaluated on an individual basis.

Grading

Grading is based on percentage of total points earned as follows:

97-100%	A plus	93-96%	A	90-92%	A minus
87-89%	B plus	83-86%	B	80-82%	B minus
77-79%	C plus	73-76%	C	70-72%	C minus
67-69%	D plus	63-66%	D	60-62%	D minus
Below 60%			F		
Values used when converting letter grades to percentages:					
98%	A plus	95%	A	91%	A minus
88%	B plus	85%	B	81%	B minus
78%	C plus	75%	C	71%	C minus
68%	D plus	65%	D	61%	D minus
50% or below			F		

Example

Component	% Earned	%	X	Points Possible	=	Points Earned	
Clinical Assignment	90%	.90	X	7	=	6.30	
Self-Assessment: Resting & Sub-Max Exercise	85%	.85	X	6	=	5.10	
Self-Assessment: GXT	82%	.82	X	7	=	5.74	
Exercise Programming	93%	.93	X	3	=	2.79	
Client Assessment	90%	.90	X	12	=	10.80	
Competency Tests	95%	.95	X	10	=	9.50	
GXT Tasks	100%	1.00	X	3	=	3.00	
Competency-Client Assmt.	90%	.90	X	4	=	3.60	
Quizzes (average %)	82%	.82	X	16	=	13.12	
Midterm Examination	78%	.78	X	16	=	12.48	
Final Examination	90%	.90	X	16	=	14.40	
						86.83	
						Grade: B+	

Classroom Protocol

This is a professional preparation course. Students are expected to:

- **Be fully prepared; actively and enthusiastically participate** in ALL lecture/laboratory sessions and class discussions.
- **Read assigned material and lab instructions BEFORE class.** (Lecture and lab time will be used to present material, help students master techniques, and check competencies. Students are directed to the green sheet and course reader for answers to many of their procedural questions.)
- Bring textbook, calculator, course reader, and other necessary supplies to class.
- Dress appropriately for scheduled activities.
- Participate in demonstrations and data collection.
- Enthusiastically assist other students with practice sessions and testing.
- PRACTICE, PRACTICE, PRACTICE techniques. **Use your class time effectively!** Ask for guidance from instructor if having difficulty mastering a technique.
- Complete competencies and assignments on time.
- Use equipment properly; clean and put away all equipment before leaving lab area.
- Keep lab clean. No food is allowed in the lab; covered drinks only.
- Silence cell phones during class. Use electronic equipment ONLY for class activities (e.g., note taking). Texting, scanning the internet, and checking e-mail during class are unprofessional, disrespectful, and distracting to others.

Students who consistently demonstrate professionalism, as described above, WILL be able to complete all lab activities and competencies in a timely manner. Students who choose not to use laboratory time effectively may not complete all assignments, and should not expect the instructor to ensure that they do. Borderline grades may be raised or lowered depending upon student's professional commitment.

The most effective class results when EACH class member makes an INDIVIDUAL COMMITMENT to be an active participant in the teaching/learning process. Individual contributions and differing viewpoints will be appreciated and respected. Students are responsible for material presented and announcements made in each class. Students who miss class (a rare occurrence!) are responsible for obtaining material from another student BEFORE seeing the instructor about content missed.

Maximal testing must be supervised by ACSM certified personnel (exercise test technologist, clinical exercise specialist, RCEP, or program director).

University Policies

Dropping and Adding

Students are responsible for understanding the policies and procedures about add/drop, grade forgiveness, etc. Refer to the current semester's [Catalog Policies](http://info.sjsu.edu/static/catalog/policies.html) section at <http://info.sjsu.edu/static/catalog/policies.html>. Add/drop deadlines can be found on the current academic year calendars document on the [Academic Calendars webpage](http://www.sjsu.edu/provost/services/academic_calendars/) at http://www.sjsu.edu/provost/services/academic_calendars/. February 3 is the last day to drop this course without a "W" being assigned. According to University policy, dropping this course after Feb. 3 is permissible only for serious and compelling reasons, and requires written documentation. Unsatisfactory performance in course work is not a serious and compelling reason. The [Late Drop Policy](http://www.sjsu.edu/aars/policies/latedrops/policy/) is available at <http://www.sjsu.edu/aars/policies/latedrops/policy/>. Students should be aware of the current deadlines and penalties for dropping classes. The last day to add is Feb. 10. However, students who receive add codes should use them within 24 hours, or the class space and add code may be given to another student.

Information about the latest changes and news is available at the [Advising Hub](http://www.sjsu.edu/advising/) at <http://www.sjsu.edu/advising/>.

Consent for Recording of Class and Public Sharing of Instructor Material

[University Policy S12-7](http://www.sjsu.edu/senate/docs/S12-7.pdf), <http://www.sjsu.edu/senate/docs/S12-7.pdf>, requires students to obtain instructor's permission to record the course.

- "Common courtesy and professional behavior dictate that you notify someone when you are recording him/her. You must obtain the instructor's permission to make audio or video recordings in this class. Such permission allows the recordings to be used for your private, study purposes only. The recordings are the intellectual property of the instructor; you have not been given any rights to reproduce or distribute the material." Additionally, because this class has a laboratory component, permission of other students in the class must also be obtained.
- "Course material developed by the instructor is the intellectual property of the instructor and cannot be shared publicly without his/her approval. You may not publicly share or upload instructor generated material for this course such as exam questions, lecture notes, or homework solutions without instructor consent."

Academic Integrity

Your commitment as a student to learning is evidenced by your enrollment at San Jose State University. The [University Academic Integrity Policy S07-2](http://www.sjsu.edu/senate/docs/S07-2.pdf) at <http://www.sjsu.edu/senate/docs/S07-2.pdf> requires you to be honest in all your academic course work. Faculty members are required to report all infractions to the office of Student Conduct and Ethical Development. The [Student Conduct and Ethical Development website](http://www.sjsu.edu/studentconduct/) is available at <http://www.sjsu.edu/studentconduct/>.

Campus Policy in Compliance with the American Disabilities Act

If you need course adaptations or accommodations because of a disability, or if you need to make special arrangements in case the building must be evacuated, please make an appointment with me as soon as possible, or see me during office hours. [Presidential Directive 97-03](http://www.sjsu.edu/president/docs/directives/PD_1997-03.pdf) at http://www.sjsu.edu/president/docs/directives/PD_1997-03.pdf requires that students with disabilities requesting accommodations must register with the [Accessible Education Center](http://www.sjsu.edu/aec) (AEC) at <http://www.sjsu.edu/aec> to establish a record of their disability. AEC: Admin 110, 408-924-6000.

**KIN 154B – ECG & GXT, Spring 2015
PROPOSED SCHEDULE**

(Subject to change with fair notice – changes will be announced in class.)

Date	Topic	Reading Assignments
Thurs., Jan. 22	Introduction & course overview, cardiac anatomy & physiology	
Tues., Jan. 27	Cardiac anatomy & physiology, resting blood pressure	Wesley - Chap. 1 ACSM - pp. 41-46 CR - Assessing BP
Thurs, Jan. 29	Benefits and risks associated with exercise, health screening & risk stratification	ACSM- Preface, Chaps. 1, 2 (delete risk stratification for patients with cardiovascular disease) CR – Health screening, risk stratification
Tues., Feb. 3	Exercise blood pressure, treadmill & bicycle operation & calibration QUIZ #1 (Cardiac anatomy & physiology)	CR - Bicycle & treadmill calibration
Thurs., Feb. 5	Electrode placement, electrocardiograms, normal sinus rhythm	Wesley – Chaps. 2 (skip modified chest leads), 3, 11 (skip right-sided chest leads) ACSM - pp. 413-415
Tues., Feb. 10	ECG interpretation QUIZ #2 (Benefits & risks of exercise, health screening & risk stratification, resting BP) COMPETENCY TEST: Resting BP	Wesley - Chap. 4
Thurs., Feb. 12	Contraindications, informed consent, pretest instructions, QRS axis	ACSM - pp. 40-41, 52-57 Wesley - Chap. 12, pp. 343-348
Tues., Feb. 17	Measuring VO ₂ , metabolic cart, emergency management, GXT QUIZ #3 (Electrode placement, electrocardiograms, normal sinus rhythm)	ACSM - pp. 60-62, 72-87, 114-134, 137-138, Appendix B CR – Sartor et al., 2013
Thurs., Feb. 19	Sinus dysrhythmias, GXT	Wesley - Chap. 5
Tues., Feb. 24	Sinus dysrhythmias, GXT QUIZ #4 (Exercise testing: contraindications, informed consent, pretest instructions, measuring VO ₂ , emergency mgmt; QRS axis) COMPETENCY TEST: Electrode placement	

Date	Topic	Reading Assignments
Thurs., Feb. 26	No Class – Work on Self-Assessment	
Tues., Mar. 3	Atrial dysrhythmias, GXT QUIZ #5 (Sinus dysrhythmias) COMPETENCY TEST: Exercise BP (cycle or treadmill)	Wesley - Chap. 6
Thurs., Mar. 5	Atrial & junctional dysrhythmias, GXT DUE: Self-Assessment: Resting & Submaximal Exercise	Wesley - Chap. 7
Tues., Mar. 10	Catch-up & review	
Thurs., Mar. 12	MIDTERM EXAM	
Tues., Mar. 17	Ventricular dysrhythmias, GXT	Wesley - Chap. 8 ACSM – Table C.8
Thurs., Mar. 19	Ventricular arrhythmias, GXT	
Tues., Mar. 24	SPRING BREAK	
Thurs., Mar. 26	SPRING BREAK	
Tues., Mar. 31	CAMPUS HOLIDAY	
Thurs., Apr. 2	Data interpretation, exercise programming, behavior change DUE: Self-Assessment: GXT	ACSM - pp. 87-94 (Table 4.9), 142-153, 162-179, Chap. 11 CR – Blair; Skinner & McLellan, 1980
Tues., Apr. 7	Ischemia & infarct, GXT QUIZ #6 (Ventricular dysrhythmias) COMPETENCY TEST: Treadmill or bike calibration	Wesley - Chap. 16 ACSM – Table C.7 CR - ACSM Certified News
Thurs., Apr. 9	Ischemia & infarct, GXT	
Tues., Apr. 14	AV blocks, GXT QUIZ #7 (Ischemia & infarct)	Wesley - Chap. 9 ACSM – Tables C.9, C.10
Thurs., Apr. 16	AV blocks, GXT DUE: Exercise Programming Case Study	
Tues., Apr. 21	Bundle branch blocks, GXT QUIZ #8 (AV blocks)	Wesley – Chap. 13 (skip hemiblocks & fascicular blocks)

Date	Topic	Reading Assignments
Thurs., Apr. 23	Bundle branch blocks, GXT DUE: Clinical Assignment	
Tues., Apr. 28	CPR Training	
Thurs., Apr. 30	Clinical exercise testing, exercise testing with imaging, sensitivity & specificity, legal issues DUE: Client Assessment DUE: GXT Tasks Completed	ACSM - pp. 134-137, 153-157 CR – Ashley & Myers, 2003; Nuclear imaging
Tues., May 5	Cardiac enlargement QUIZ #9 (Bundle branch blocks)	Wesley – Chap. 15 (chamber enlargement & hypertrophy only) ACSM – Tables C.5, C.6 CR – deJong, 2011
Thurs., May 7	Catch-up & summary Last Day to Complete Competency Testing	CR – Risk Mgmt Pyramid (Eickhoff-Shemek et al., 2008)
Tues., May 12	Review	
Fri., May 15 9:45 -12:00	FINAL EXAM	

CR = Course Reader