

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

**KIN 154B – ECG Interpretations & Graded Exercise Testing
Sections 1 & 2 – Spring 2022**

Course and Contact Information

Instructor:	Peggy Plato, Ph.D.
Office Location:	SPX 174
Email:	Peggy.Plato@sjsu.edu
Office Hours:	Tuesdays: 10:00 am – 12:00 noon https://sjsu.zoom.us/j/88636508030?pwd=UC8xNXZ5VmNvT0pQY1h1OUUwdmd1QT09 Drop in via Zoom; other times available by appointment
Class Days/Time:	MW 9:30 -11:20 am
Classroom:	YUH 233 (online until Feb. 14)
Prerequisites:	KIN 70 & KIN 155 with grades of C- or better, Human Physiology, Introductory Chemistry, GE Math Current CPR certification – dependent on COVID positivity rate

Course Format

This is a lecture-laboratory course; however, because of COVID-19, the lab activities that will be performed will be based on safety considerations. For laboratory activities that cannot be safely performed, students will receive data to complete the assignment. Students are expected to read the assigned material and listen to the pre-recorded lectures BEFORE the class meeting in which that material will be discussed.

Course Description

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

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 will be able to:

- PLO 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.
- PLO 2 effectively communicate in writing (clear, concise and coherent) on topics in kinesiology.
- PLO 3 effectively communicate through an oral presentation (clear, concise and coherent) on topics in kinesiology.
- PLO 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.
- PLO 5 identify and analyze social justice and equity issues related to kinesiology for diverse 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, cardiac enlargement, and myocardial ischemia 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 of graded exercise testing methods, instrumentation, and protocols.
- CLO 9 demonstrate the ability to explain and interpret ECG and GXT results.
- 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 knowledge and application of behavior change theories and strategies that may be used when programming exercise.
- CLO 12 demonstrate an understanding of emergency medical procedures that may be necessary during a GXT or exercise session.
- CLO 13 compare/contrast clinical exercise testing with GXT procedures learned in class.
- CLO 14 demonstrate sensitivity to age, gender, cultural, and other individual differences that may affect the ECG, GXT, and exercise programming.

Required Materials

Textbooks:

Liguori, G. (Ed.). (2022). *ACSM's guidelines for exercise testing and prescription* (11th ed.). Philadelphia: Wolters Kluwer. ISBN: 978-1-975150-18-1

Wesley, K. (2017). *Huszar's ECG and 12-lead interpretation*. (5th ed.). St. Louis: Elsevier. ISBN: 9780323355759

Other Materials:

- Calculator
- 10 Scantron 815E answer sheets & #2 pencil for quizzes
- 2 Scantron 882E answer sheets & #2 pencil for the midterm and final exams
- ECG calipers (optional)

Class Format

This is a partially flipped class format. Most lectures are pre-recorded and posted on Canvas for asynchronous viewing BEFORE the assigned class. Class time will be used to discuss and review the course content, practice ECG interpretation, and perform the laboratory activities. In-class quizzes are scheduled on Wednesdays.

Professionalism

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

- Be fully prepared, arrive on time, and actively and enthusiastically participate in all lecture and laboratory activities.
 - Read the assigned material and view the pre-recorded lecture before the class in which the topic is scheduled. Students are directed to this course syllabus and materials posted on Canvas for many of their procedural questions.
 - Bring required materials to class.
 - Dress appropriately for scheduled laboratory activities.
- Participate in demonstrations and data collection.
- Enthusiastically serve as a client for others.
- Use your lab time effectively! Ask for guidance from instructor if having difficulty mastering a technique.
- Complete assignments on time and submit as instructed (e.g., uploaded to Canvas or a hard copy submitted in class).
- Use equipment properly. Clean and put away all equipment before leaving lab area.
- Keep lab clean. No food or drinks are allowed in the lab except covered beverages. If your beverage container sweats and leaves water on tables, you must clean it up. With the current mask mandate, you may briefly remove your mask to take a drink and then promptly replace your mask.
- The grade you **EARN** should reflect **YOUR** knowledge and skills, **NOT** the knowledge and skills of others. **Carefully read 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> Earning your college degree is important -- think carefully before jeopardizing your degree!**

Everyone has a responsibility for helping to ensure a physically and emotionally safe learning environment. SJSU COVID-19 guidelines must be followed. Currently, masks are required indoors except when in a private office with the door closed. Masks must fully cover the nose, mouth, and chin. SJSU COVID-19 guidelines may change during the semester – they may become more or less restrictive. If they are less restrictive, masks may still be required during laboratory activities in which there is close contact with others. If guidelines become less restrictive, some individuals may choose to continue wearing masks for personal reasons (e.g., health concerns or contact with individuals who are not eligible for vaccination).

If you are not feeling well, stay home! Notify your instructor who will make every effort to provide reasonable accommodations. However, reasonable accommodations do not include offering the class in multiple formats, such as online and in-person.

Students who consistently demonstrate professionalism, as described above, WILL be able to complete all lab assignments 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.

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.

Evaluation - Example

	CLO	KIN PLO	Points Possible	X	% Earned	=	Points Earned
Competencies	8	1	10	X	95%	=	9.50
Resting & Submaximal Exercise	8, 9	1, 2	10	X	88%	=	8.80
Resting ECG Interpretation	2	1	5	X	84%	=	4.20
Exercise Programming Case Study	10, 14	1, 2	6	X	86%	=	5.16
Behavior Change Presentation	11	1, 3	6	X	94%	=	5.64
GXT Interpretation & Exercise Programming	9, 10, 14	1, 2	12	X	88%	=	10.56
Clinical Assignment	13, 14	1, 2	6	X	94%	=	5.64
Quizzes (average %)	1-10	1	15	X	79%	=	11.85
Midterm Exam – Wed., Mar. 16	1-10	1	15	X	84%	=	12.60
Final Exam (comprehensive) Tues., May 24, 7:15-9:30 am	1-13	1	15	X	86%	=	12.90
0.5 and above rounded up; below 0.5 rounded down							86.85
							Grade: B+

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		

Note: "All students have the right, within a reasonable time, to know their academic scores, to review their grade-dependent work, and to be provided with explanations for the determination of their course grades." See [University Policy F13-1](http://www.sjsu.edu/senate/docs/F13-1.pdf) at <http://www.sjsu.edu/senate/docs/F13-1.pdf> for more details.

Competencies

Students will demonstrate proficiency in each of the following:

- Measuring resting blood pressure
- Measuring blood pressure during treadmill walking
- Measuring blood pressure during stationary cycling
- Preparing a client for a 12-lead ECG
- Treadmill calibration
- Bicycle ergometer calibration

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. Only one competency may be attempted on the last day of competency testing.

Assignments

- For **Resting and Submaximal Exercise**, it is anticipated that you will receive data rather than collecting your own data.
- For **Resting ECG Interpretation**, it is anticipated that you will collect and analyze your resting ECG.
- For the **Exercise Programming Case Study**, you will receive data to use.
- For the **Behavior Change Presentation**, you will be working in a small group to briefly present a behavior change theory or strategy.
- For **GXT Interpretation and Exercise Programming**, it is anticipated that you will receive data to analyze and use.
- For the **Clinical Assignment**, you will be summarizing short videos on clinical and pharmaceutical exercise tests and procedures.
- Instructions for each assignment are posted on Canvas, including how to submit the assignment (e.g., uploaded to Canvas or hard copy submitted in class).
- Written work must be typed, double spaced, and proofread. (Check for grammar, spelling, and syntax -- if in doubt, look it up!) Assignments that are submitted during class must be submitted by 11:20 am on the due date. Assignments submitted on Canvas should be uploaded by 11:59 pm on the due date. Grades may be lowered for late assignments as follows:

Due Date	Received	Grade Lowered
Monday	Tuesday & Wednesday	1 grade step (e.g., A minus to B plus)
	Thursday & Friday	2 grade steps (e.g., A minus to B)
	Sat. through the following Monday	1 full grade (e.g., A minus to B minus)
Wednesday	Thursday & Friday	1 grade step
	Saturday & Sunday	2 grade steps
	Mon. through the following Wednesday	1 full grade
Students must speak with the instructor regarding assignments that are more than 1 week late.		

The KIN library liaison is Adriana Poo (adriana.poo@sjsu.edu) 408-808-2019.

Quizzes & Exams

- In-person quizzes and exams will be completed during class time. They are closed book and notes. Make-up quizzes and 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. All requests for make-up exams will be evaluated on an individual basis.
- The first two quizzes will be online on Canvas. Materials that may be used and not used during online quizzes will be explained in class and on Canvas.
- Questions may include true-false, multiple choice, matching, short answer, problems, and calculations.
- There are 12 quizzes; the lowest 2 quiz scores will be dropped.

University Policies

- University policy S16-9 at <https://www.sjsu.edu/senate/docs/S16-9.pdf>: “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.” **For a 3-unit class, this is equivalent to 9 hours per week.**
- University Policy F15-12 at <https://www.sjsu.edu/senate/docs/F15-12.pdf>: “Students are expected to attend all meetings for the courses in which they are enrolled as they are responsible for material discussed therein and active participation is frequently essential to ensure maximum benefit to all class members. In some cases, attendance is fundamental to course objectives; for example, students may be required to interact with others in the class. Attendance is the responsibility of the student.”
- Per [University Policy S16-9](http://www.sjsu.edu/senate/docs/S16-9.pdf) (<http://www.sjsu.edu/senate/docs/S16-9.pdf>), relevant information to all courses, such as academic integrity, accommodations, dropping and adding, consent for recording of class, etc. is available on Office of Graduate and Undergraduate Programs’ [Syllabus Information web page](http://www.sjsu.edu/gup/syllabusinfo/) at <http://www.sjsu.edu/gup/syllabusinfo/>. Make sure to visit this page, review and be familiar with these university policies and resources. Some of this information is excerpted below.

- According to University policy, Feb. 7 is the last day to drop this course without a “W” being assigned. Dropping after Feb. 7 is permissible for serious and compelling reasons beyond the student’s control and requires written documentation. Unsatisfactory performance in course work is not a serious and compelling reason. Additional information is available at: <http://www.sjsu.edu/aars/policies/latedrops/policy/>. The last day to add is Feb. 14; 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.
- **Course Materials:** “Course material developed by the instructor is the intellectual property of the instructor and cannot be shared publicly without her approval.” You may not publicly share or upload instructor-generated material for this course, such as exam or quiz questions, lecture notes, or hand-outs, without instructor consent. **You may not copy or take photos of any exam or quiz question.** Doing so is a violation of the Academic Integrity Policy.
- **Recording in Class:** “Common courtesy and professional behavior dictate that you notify individuals when you are recording them. 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.” Recording any students during class activities requires permission of those individuals as well as permission from the instructor. Online Zoom class meetings may be recorded by the instructor and posted on Canvas.
- **Academic Integrity:** As a student, your commitment to learning is evidenced by your enrollment at San José State University. The [University Academic Integrity Policy F15-7](#) 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. Visit the [Student Conduct and Ethical Development](#) website for more information.

Instances of academic dishonesty will not be tolerated. Cheating on exams or plagiarism (presenting the work of another as your own, or the use of another person’s ideas without giving proper credit) will result in a failing grade and sanctions by the University. All assignments are to be completed by the individual student unless otherwise specified. You are encouraged to discuss material with other students to enhance your understanding. However, assignments that are submitted **MUST** be your own work. Do NOT send part or all of your assignment to others. By doing this, you lose control over your work and leave yourself open to cheating and violations of the academic integrity policy.

“The University emphasizes responsible citizenship and an awareness of ethical choices inherent in human development. Academic honesty and fairness foster ethical standards for all those who depend upon the integrity of the university, its courses, and its degrees. University degrees are compromised and the public is defrauded if faculty members or students knowingly or unwittingly allow dishonest acts to be rewarded academically.” (Academic Senate Policy S15-7)

- **Campus Policy in Compliance with the Americans with Disabilities Act:** Students who need course adaptations or accommodations because of a disability should notify the instructor as soon as possible.

KIN 154B – ECG & GXT, Spring 2022 PROPOSED SCHEDULE

(Subject to change with fair notice – changes will be announced in class, via e-mail and/or posted on Canvas.)

Date	Topic	Reading Assignments
Wed., Jan. 26	Introduction & class overview, cardiac anatomy & physiology	
Mon., Jan. 31	Cardiac anatomy & physiology	Wesley - Chap. 1
Wed., Feb. 2	Benefits and risks of exercise, pre-participation health screening Quiz #1 ONLINE (Cardiac anatomy & physiology)	ACSM- Foreward, Nota Bene, Preface, Chaps. 1 & 2
Mon., Feb. 7	Submaximal exercise testing, contraindications, informed consent, pretest instructions	ACSM – pp. 58-61, 73-90, Appendix D Canvas – Sartor et al., 2013
Wed, Feb. 9	Treadmill & bicycle calibration Quiz #2 ONLINE (Benefits & risks of exercise, pre-participation health screening)	
Mon., Feb. 14	Measuring blood pressure	ACSM - pp. 61 & Boxes 3.1 & 3.2
Wed., Feb. 16	Electrode placement, ECG leads Quiz #3 (Submaximal exercise testing, contraindications, informed consent, pretest instructions)	Wesley – Chap. 2 (skip modified chest leads) & pp. 174-183 (skip right-sided chest leads) ACSM – Tables B.1 & B.2
Mon., Feb. 21	Components of the ECG	Wesley – Chap. 3 ACSM – Table B.4
Wed., Feb. 23	ECG interpretation Quiz #4 (Measuring blood pressure, electrode placement, ECG leads)	Wesley - Chap. 4 ACSM – Table B.3
Mon., Feb. 28	Mean QRS Axis DUE: Resting & Submaximal Exercise	Wesley - pp. 183-196, Appendix A (Method D, 6-lead method)

Date	Topic	Reading Assignments
Wed., Mar. 2	Sinus rhythms Deadline for 1st attempt at resting BP competency Quiz #5 (ECG components & interpretation)	Wesley - Chap. 5
Mon., Mar. 7	Atrial rhythms	Wesley - Chap. 6
Wed., Mar. 9	Junctional rhythms Deadline for 1st attempt at electrode placement competency Quiz #6 (Sinus rhythms & mean QRS axis) DUE: Resting ECG Interpretation	Wesley - Chap. 7
Mon., Mar. 14	Catch-up & review	
Wed., Mar. 16	MIDTERM EXAM	
Mon., Mar. 21	Maximal exercise testing, VO ₂ , emergency management, GXT data interpretation	ACSM –pp. 73-80, 87, 89-92, 113-133 Canvas - Skinner & McLellan, 1980
Wed., Mar. 23	Data interpretation & exercise programming Deadline for 1st attempt at bike or treadmill calibration	ACSM – pp. 142-153 Canvas - Blair
Mon., Apr. 4	Exercise programming	
Wed., Apr. 6	TBA Deadline for 1st attempt at bike or treadmill blood pressure Quiz #7 (Measuring VO ₂ , metabolic cart, emergency management, data interpretation)	
Mon., Apr. 11	Behavior Change Presentations	ACSM – Chap. 12
Wed., Apr. 13	Ventricular rhythms Quiz #8 (Exercise programming)	Wesley - Chap. 8
Mon., Apr. 18	Coronary heart disease & the ECG DUE: Exercise Programming Case Study	Wesley - Chaps. 15 & 16
Wed., Apr. 20	Coronary heart disease & the ECG Quiz #9 (Behavior change & ventricular rhythms)	
Mon., Apr. 25	AV blocks	Wesley - Chap. 9
Wed., Apr. 27	Bundle branch blocks Quiz #10 (Coronary heart disease & the ECG)	Wesley – Chap. 13 (skip hemiblocks & fascicular blocks)

Date	Topic	Reading Assignments
Mon., May 2	Cardiac enlargement DUE: GXT Interpretation & Exercise Programming	Wesley – pp. 212-217 Canvas – deJong, 2011
Wed., May 4	TBA Quiz #11 (AV & bundle branch blocks)	
Mon., May 9	Clinical exercise testing, exercise testing with imaging, sensitivity & specificity DUE: Clinical Assignment	ACSM - pp. 133-137 Canvas – Ashley & Myers, 2003, nuclear imaging
Wed., May 11	Legal issues & certification Quiz #12 (Cardiac enlargement) Last Day for Competency Testing	Canvas – Eickhoff-Shemek, 2013 ACSM – Appendix C
Mon., May 16	Catch-up & summary Review	
Tues., May 24 7:15-9:30 am	FINAL EXAM	

In addition to assigned readings from the two textbooks, other readings are posted on Canvas in the appropriate module.