THE UNIVERSITY OF BRITISH COLUMBIA

School of Health and Exercise Sciences
HES 352 - Exercise Testing for Clinical Populations | Winter Term 2, January 2026

We respectfully acknowledge the Syilx Okanagan Nation and their peoples, in whose traditional, ancestral, unceded territory UBC Okanagan is situated.

Instructor: John Sasso *(he/him/his)* **Contact:** via Canvas Message **Teaching Assistant:**
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Faculty: Faculty of Health and Social Development shawna.cook@ubc.ca
Department: School of Health and Exercise Sciences

Office Hours & Open Lab times:
Office Hours & Open Lab (UCH 109): Fridays 11am-12:15pm; or by appointment

Academic Calendar Entry

Analysis of standard and specialized protocols, recommendations, equipment, personnel and parameters of exercise assessments for individuals living with clinical populations. [3-2-0] **Prerequisite**: HES 350 and either (a) HES 311 or (b) HMKN 335. *Registration limited to students in the Clinical Exercise Physiology concentration of the B.H.E.S program.*

Class Schedule *(all times in Pacific Daylight/Standard Time; local time Kelowna, BC)*:

- **LECTURE [LIB 303]**: Wednesdays & Fridays: 12:30pm – 2:00pm
- **LAB [UCH 109]**: Mondays: 8:00am – 10:00am

Course Format

The course combines lecture and laboratory components to achieve the learning objectives. Lectures will focus on the physiological bases of health assessments and exercise testing and provide an overview of current guidelines and recommendations for safe, valid and reliable assessments for individuals living with chronic conditions. Labs will provide experiential learning opportunities for students to prepare for and implement health and exercise assessments, to analyze, evaluate and communicate test results and to lead and participate in emergency scenarios and adverse events during assessment or monitoring.

Course Delivery

LECTURE: Lectures will be delivered **in-person**, with some asynchronous learning phases to complement lecture sessions. Lectures will be hosted in the above room location, unless otherwise noted, and will begin at the scheduled class times. These sessions will also be recorded and uploaded to the course website for students who cannot attend. In the cases of Asynchronous lesson delivery, a pre-recorded lesson or linked video will be posted prior to the scheduled class and students may access that lesson at their preferred time, prior to the subsequent lesson.
LABORATORY: Laboratory sessions will be conducted **in-person** and will begin at the start of students' scheduled laboratory section time. Attendance is mandatory for laboratory sessions unless illness or excused absence (approved by course instructor) precludes student attendance.
OPEN LAB: Optional "open lab" times will be provided through the term (may include some weekend days, and other off-schedule days) to provide students opportunities to enhance practical skills using specialized equipment. Students may be required to sign-up for these sessions and conduct themselves in the same professional manner as other course-related activities. More information will be provided through the term.

Required Readings and Videos

- Liguori, G., Feito, Y., Fountaine, C., & Roy, B. (2022). *ACSM's guidelines for exercise testing and prescription*. (11th Ed). Wolters Kluwer.
- Bayles, M. P. (2024). *ACSM's Exercise Testing and Prescription*. Wolters Kluwer.
- Other Required Resources will be provided through the term.

Recommended Readings

- Readings will be provided during the term, as supplemental resources for learning
- Gordon, B., Chambliss, H., Durstine, J., Jett, D., & Ross, L. (2021). *ACSM's Resources for the Exercise Physiologist: A practical guide for the health fitness professional* (3rd Ed.). Wolters Kluwer.
- Canadian Society for Exercise Physiology – Physical Activity Training for Health (CSEP-PATH). Canadian Society for Exercise Physiology.
- Gibson AL, Wagner DR & Haywood VH (2018) Advanced Fitness Assessment and Exercise Prescription 8th Edition. Human Kinetics.
- Dunbar, C., & Saul, B. (2012). *ECG interpretation for the exercise physiologist*. Wolters Kluwer.

Course Overview, Content, and Objectives

The course is designed to advance student understanding and skill in exercise assessment for individuals with chronic conditions and to guide students in safe and effective client monitoring during clinical tests. Students will furthermore increase their skill in test result analysis, and learn to further interpret test findings, assessment quality and learn to appropriately report test findings in accordance with standard documentation protocols. The learning objectives are to:

- To introduce students to current standards, guidelines and recommendations for health assessments and exercise testing across various chronic conditions
- To facilitate student learning of standards in test conduct and reporting and increase understanding of the concepts underpinning test quality (e.g. validity, reliability, sensitivity, technical error of measurement).
- To advance student skill in clinical exercise assessments, including taking patient history, selecting appropriate test protocols, conducting safe and effective measurements and managing abnormal scenarios and adverse events.

Learning Outcomes

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

1. Evaluate patient history and clinical objectives, patient status and contraindications to exercise, resources available and medical referral information to determine appropriate protocol selection for diagnostic, prognostic or prescriptive purposes.
2. Describe modification strategies that may be used for key exercise and functional fitness assessments to ensure safe and effective test conduct.
3. Identify resting, exercise and recovery abnormalities in key exercise, functional and physiological assessments specific to chronic conditions and determine how data from assessments may be used for diagnostic, prognostic and prescriptive purposes.
4. Demonstrate appropriate interpretation of findings as well as generation and communication of comprehensive summary reports.
5. Critically evaluate the utility, validity, reliability and safety (including safe ranges and limits) of common health and exercise tests, the influence of physiological variation, test precision, sensitivity and technical error of measurement on application of results.

Course Assessments	**[% of grade]**	**LEARNING OUTCOMES**
Participation & Professional Conduct	[Pass/Fail]	*All*
Reflections & Quizzes *(best 5 x 3%)*	[15%]	*LO2-LO5*
Exercise Test Design Assignment	[10%]	*LO1-LO3*
Exercise Test Analysis & Interpretation Assignment	[15%]	*LO3-LO5*
Practical Midterm Exam	[15%]	*LO1-LO4*
Practical Final Exam (**mandatory to pass*)	[45%]	*LO1-LO4*

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Course Schedule *(subject to modification of topics & timelines)*

Session			Day	Date	Topic	Assessment
1	1	LEC	Wednesday	07-Jan-26	The Why, When, What, and Where of Exercise Testing	
	2	LEC	Friday	09-Jan-26	Test Readiness & Safety Foundations: contraindications, termination, risk	
	i	**LAB**	**Friday**	**09-Jan-26**	**Lab Orientation, Safety Culture, Baseline Skills & Skills Passport**	
	ii	**LAB**	**Monday**	**12-Jan-26**	**Applied Submaximal Testing, Test Termination & Safety Readiness**	
2	3	LEC	Wednesday	14-Jan-26	Safety & Emergency Preparedness in Clinical Exercise Testing	
	4	LEC	Friday	16-Jan-26	Communication During Testing & Patient-Centred Explanations	Quiz
	iii	**LAB**	**Monday**	**19-Jan-26**	**Screening, Risk Stratification, Informed Consent, and Resting Measures**	
3	5	LEC	Wednesday	21-Jan-26	ECG Fundamentals for Exercise Testing	
	6	LEC	Friday	23-Jan-26	Blood Pressure During Exercise: Technique, Errors & Interpretation	Quiz
	iv	**LAB**	**Monday**	**26-Jan-26**	**Exercise ECG Monitoring, Signal Quality, and Safety Decisions**	
4	7	LEC	Wednesday	28-Jan-26	Submaximal Aerobic Testing: Principles, Endpoints & Safety	
	8	LEC	Friday	30-Jan-26	Interpreting Submaximal Test Results & Clinical Meaning	
	v	**LAB**	**Monday**	**02-Feb-26**	**Submaximal Testing with BP ± ECG Monitoring**	Quiz (Lab)
5	9	LEC	Wednesday	04-Feb-26	Functional, Strength & Movement-Based Assessments	
	10	LEC	Friday	06-Feb-26	Integrating Data: Vitals, ECG, Symptoms & Test Context	Quiz
	vi	**LAB**	**Monday**	**09-Feb-26**	**Functional Testing, Multi-RM Strength Assessment**	
6	11	LEC	Wednesday	11-Feb-26	Practical Midterm Review: Standards, Common Errors & Readiness	
	12	LEC	Friday	13-Feb-26	Case-Based Clinical Reasoning Workshop	**Assignment**
			Monday	16-Feb-26		
			Wednesday	18-Feb-26	**READING BREAK**	
			Friday	20-Feb-26		
	vii	**LAB**	**Monday**	**23-Feb-26**	**Mock Practical Stations & Targeted Skill Feedback**	
7	13	LEC	Wednesday	25-Feb-26	Maximal & Symptom-Limited Testing: Rationale & Safety	
	14	LEC	Friday	27-Feb-26	ECG Responses & Termination Decisions During Maximal Testing	
	viii	**LAB**	**Monday**	**02-Mar-26**	**Maximal Stress Testing with ECG & BP**	Quiz (Lab)
8	15	LEC	Wednesday	04-Mar-26	CPET Protocols, Equipment & Data Quality	*Possible Pract*
	16	LEC	Friday	06-Mar-26	Stepwise CPET Interpretation & Limitation Patterns	*Midterm*
	ix	**LAB**	**Monday**	**09-Mar-26**	**Practical Midterm Examination**	**Practical Midterm**
9	17	LEC	Wednesday	11-Mar-26	Strength, Balance & Functional Outcomes in Clinical Testing	
	18	LEC	Friday	13-Mar-26	Communicating Test Results: Reports & Client Conversations	
	x	**LAB**	**Monday**	**16-Mar-26**	**CPET Conduct & Monitoring**	
10	19	LEC	Wednesday	18-Mar-26	Spirometry & Pulmonary Function Testing	
	20	LEC	Friday	20-Mar-26	Integrating PFT with Exercise Testing	Quiz
	xi	**LAB**	**Monday**	**23-Mar-26**	**Strength, Balance, and Health-Related Fitness Testing**	
11	21	LEC	Wednesday	25-Mar-26	Exercise Testing in Diabetes & Metabolic Conditions	
	22	LEC	Friday	27-Mar-26	Clinical Decision-Making in Metabolic Conditions	
	xii	**LAB**	**Monday**	**30-Mar-26**	**Advanced CEP Testing Scenarios: BG Monitoring & Incident Response**	Quiz (Lab)
12	23	LEC	Wednesday	01-Apr-26	Complex Conditions and Multimorbidity in Exercise Testing	**Assignment**
			Friday	03-Apr-26	*Asynchronous* : Documentation, Reporting & Professional Communication	
			Monday	**06-Apr-26**	**Easter Monday - University Closed**	
13	24	LEC	Wednesday	08-Apr-26	Documentation & Communication Workshop + Final Practical Integration	Quiz
			Friday	**13-Apr-26**	***Integrated Simulation / Final Practical Exam Preparation (optional)***	
		No Class		10-Apr-26		
		Final Exam Period (Apr 13-24)			**PRACTICAL EXAM (Date TBD)**	**Practical Final Exam**

Course Assessment Details:

Below are brief descriptions of the assessments involved in this course, including course weighting, assessment topics and estimates of time required to complete the assessment (these are estimates to help guide work requirements, however individual students may require more or less time). Due dates of assignments below are approximate and are subject to change based on course progression to permit students appropriate time for completion. Further information for each assessment will be provided during the course.

Participation and Professional Conduct

Throughout the term, students will be asked to participate as a community of learners, contributing to the ongoing evolution of course material, of peer learning, of interpersonal discourse and peer feedback. Class participation is especially valuable during practical laboratory sessions, where students will work together to conduct activities and experiments to promote learning. Students are expected to participate actively and professionally in all laboratory sessions. This includes preparation, safe conduct, respectful communication, engagement in peer learning, and responsiveness to feedback. **Full attendance and appropriate professional behaviour in labs are required to pass the course** (exceptions may be granted for students with excused absences). A grade of Pass / Fail will be given for attendance and active participation (e.g., volunteering as a participant, leading measurements, contributing to group discussions, safe and professional conduct) in laboratory sessions through the term. *Approximate time: ongoing*

Course Weight: Pass / Fail

Due Date: Ongoing

Reflections & Quizzes

Short quizzes and reflective prompts will be used to support learning throughout the term. These may assess practical lab procedures and standards, interpretation of testing data, clinical reasoning and decision-making, reflection on skill development and feedback. A total of 7-8 quizzes/reflections will be offered; the best 5 scores will count toward the final grade. Submissions are individual and completed in class/lab via paper quizzes, or via Canvas, as appropriate. *Approximate time: 5 x 20mins*

Course Weight: 15% (5 x 3%)

Due Date: As indicated, either in class/lab time, or via Canvas on Thursdays (10:00pm PDT)

Exercise Test Design Assignment

Students will be asked to design an appropriate exercise test battery based on client history / needs to assess a component of health, fitness or performance. Test design will include a rationale for the test choice, detailed overview of the procedures (including monitoring needs, variables assessed, and outcomes) and other strategic aspects related to safe and effective planning of a test battery. The assignment emphasizes alignment between referral question and test selection, safety considerations and contraindications, protocol details, monitoring needs, termination criteria and justification of choices using course concepts. This assignment focuses on planning and clinical reasoning, not execution. The format of the assignment will be provided during the course, and may include written or video discussion. *Approximate time: 3-6hours*

Course Weight: 10%

Due Date: Monday February 10, 2025 (10:00pm PDT)

Exercise Test Analysis Assignment

Using data from a laboratory-based test or provided case, students will evaluate test quality and appropriateness, interpret key physiologic responses and outcomes, identify limitations or concerns, communicate findings clearly in a professional written or recorded format. Emphasis is placed on clarity, accuracy, and clinical relevance. The format of the assignment will be provided during the course, and may include written or video discussion of the results. *Approximate time: 5-8hours*

Course Weight: 15%

Due Date: Wednesday April 1, 2025 (10:00pm PDT)

Practical Midterm Examination

The practical midterm evaluates foundational clinical testing skills, including but not limited to patient preparation and communication, exercising blood pressure measurement, ECG setup and basic monitoring, safe test conduct and decision-making. The midterm is designed as a formative checkpoint, providing structured feedback to guide continued skill development before advanced testing later in the term.

Course Weight: 15%

Due Date: Week of March 9, 2026 (individual exam time TBD)

Practical Final Examination

The final practical exam is the primary summative assessment of the course. Students will conduct an exercise testing session with a simulated clinical client, demonstrating safe and appropriate test selection, effective physiologic monitoring (e.g., BP, ECG, symptoms), accurate interpretation of findings, clear communication with the client and examiner, professional conduct and clinical reasoning. **Students must pass the final practical exam to pass the course**. As the primary culminating task of the course, the final evaluation will be conducted during the examination period. More information related to the evaluation criteria and scheduling will be provided through the term. *Approximate time: 150mins*

Course Weight: 45%

Due Date: During Final Examination Period (individual exam time TBD)

Estimated Coursework Time:

Quality of learning is more important than quantity; every student learns differently and requires different time to learn and complete tasks, but these estimates highlight some expectations of time required to support your learning.

- *Lecture*: 160mins / week
- *Laboratory*: 180mins / week
- *Reading*: 60mins / week
- *Practice Skills*: 60mins / week
- *Assignments, Study*: 30mins / week

TOTAL COURSE TIME: ~7-9 hrs / week *(4.3 independent, 4.6 scheduled time)*

Passing/Grading Criteria

You must achieve an overall grade of at least 50% and pass the Final Practical Exam in order to pass this course. Individual assessments will have their own grading rubrics and criteria; please ensure you understand their policies through the term.

Learning Resources

Open Lab: In this course, you will be assessed on your competence in a series of skills that relate to exercise testing. In order to support your learning of these practical skills, you be provided opportunities both in-lab and optional (Open Lab) time outside of scheduled lab sessions. To engage in these 'Open Lab' sessions, you may need to sign up, come to UCH with another student in the class, and use the equipment responsibly to practice. A staff member will be present, but will not be leading a session; they will ensure safe practice and may provide feedback to you in your skills. You will need to follow the standard laboratory regulations during Open Lab times.

Late policy

Assignment deadlines are established to support your continued sequential and progressive learning. At the same time, we acknowledge that there are sometimes unforeseen circumstances that preclude our ability to meet those deadlines. Please inform your instructor of any late submissions, or to seek approval for an extension if needed; refer to the policies for the School of Health & Exercise Sciences (including Self-Declaration policy). With respect to these principles, the following policies apply to these evaluations:

- Assignments will be subject to a late penalty of 5% for the first 24 hours and 10% per day up to 10 days. Assignments submitted after 10 days will be given a grade of zero.
- Regrading of marked assignments will only be performed up to 10 days after an assessment has been marked, and after a reasonable course of action has been taken (e.g., reviewed the assignment rubric, discussed with the instructor, reflected on the answers, support for alternative marking) at which point another teaching member or third party will mark the assignment.

Missed exam policy

If students anticipate the need for rescheduling of a midterm ahead of time (for a reason outlined in the SHES polices), they must make a request to their instructor as early as possible (at least 2 weeks prior). If a midterm is *missed* for medical or other reasons outlined in the SHES policies, students must inform their instructor and request a new date for writing as soon as reasonably possible. The instructor will work with you to determine the best course of action. If you have missed an assessment, it is important that you do not discuss the missed exam with students who have completed the exam, as this constitutes a form of Academic Misconduct. Please note, no re-writes (writing an assessment more than once) will be permitted and requests for moving of a midterm date may or may not be approved. Final exam is addressed below.

Missed Activity Policy:

Throughout the term, students will be asked to participate as a community of learners, contributing to the evolution of course material, peer learning, interpersonal discourse and feedback. Class participation is especially valuable during tutorial sessions, where students will work together to conduct activities that promote learning. Therefore, **full attendance and active participation in laboratory activities is required for course completion** (exceptions may be granted for students with excused absences). A mark of Pass / Fail will be given for attendance and active participation (e.g., contributing to group discussions, safe and professional conduct) in tutorials through the term. *There is a 10% deduction from the total course mark for every unexcused absence to tutorial sessions.* If you are sick or have another unforeseen issue arise, please contact your instructor as soon as possible so that other accommodations may be made.

Generative Artificial Intelligence Use in this Course:

The use of generative AI tools, including ChatGPT and other similar tools, to complete or support the completion of any form of assignment or assessment in this course is not allowed and would be considered academic misconduct.

Additional UBC-Okanagan Policies

Policies and Regulations

Visit UBC Okanagan's Academic Calendar for a list of campus-wide regulations and policies, as well as term dates and deadlines.

UBC Values

UBC creates an exceptional learning environment that fosters global citizenship, advances a civil and sustainable society, and supports outstanding research to serve the people of British Columbia, Canada, and the world. UBC's core values are excellence, integrity, respect, academic freedom, and accountability.

Final Examinations

You can find the Senate-approved term and examination dates here. Except in the case of examination clashes and hardships (three or more formal examinations scheduled within a 27-hour period) or unforeseen events, students will be permitted to apply for out-of-time final examinations only if they are representing the University, the province, or the country in a competition or performance; serving in the Canadian military; observing a religious rite; working to support themselves or their family; or caring for a family member. Unforeseen events include (but may not be limited to) the following: ill health or other personal challenges that arise during a term and changes in the requirements of an ongoing job.

Further information on Academic Concession can be found under Policies and Regulation in the Okanagan Academic Calendar http://www.calendar.ubc.ca/okanagan/index.cfm?tree=3,48,0,0

Academic Integrity

The academic enterprise is founded on honesty, civility, and integrity. As members of this enterprise, all students are expected to know, understand, and follow the codes of conduct regarding academic integrity. At the most basic level, this means submitting only original work done by you and acknowledging all sources of information or ideas and attributing them to others as required. This also means you should not cheat, copy, or mislead others about what is your work. Violations of academic integrity (i.e., misconduct) lead to the breakdown of the academic enterprise, and therefore serious consequences arise and harsh sanctions are imposed. **For example, incidences of plagiarism or cheating usually result in a failing grade or mark of zero on the assignment or in the course.** Careful records are kept to monitor and prevent recidivism. A more detailed description of academic integrity, including the University's policies and procedures, found in the Academic Calendar.

Academic Misconduct

The academic enterprise is founded on honesty, civility, and integrity. Violations of academic integrity (i.e., academic misconduct) lead to the breakdown of the academic enterprise, and therefore serious consequences arise and harsh sanctions are imposed. For example, incidences of plagiarism or cheating may result in a mark of zero on the assignment or exam and more serious consequences may apply if the matter is referred for consideration for academic discipline. Careful records are kept to monitor and prevent recurrences. Any instance of cheating or taking credit for someone else's work, whether intentionally or unintentionally, can and often will result in at minimum a grade of zero for the assignment, and these cases will be reported to the Head of the Department and Associate Dean Academic of the Faculty.

Grading Practices

Faculties, departments, and schools reserve the right to scale grades in order to maintain equity among sections and conformity to University, faculty, department, or school norms. Students should therefore note that an unofficial grade given by an instructor might be changed by the faculty, department, or school. Grades are not official until they appear on a student's academic record.
http://www.calendar.ubc.ca/okanagan/index.cfm?tree=3,41,90,1014

Student Service Resources

Walk-In Well-Being Clinic

The Walk-In Well-Being clinic offers no-fee, brief, single-session psychological services. Sessions are led by a doctoral student in clinical psychology and supervised by a registered psychologist (UBCO Faculty member). Clinicians can provide support with stress management, sleep, self-care, depression, anxiety, interpersonal issues, substance misuse, coping with academic demands/stressors, and provide options for connecting to additional resources. Virtual or in-person sessions are available at the UBCO Psychology Clinic, located in ASC 167 with or without an appointment, on Tuesdays and Thursdays between 10 am and 3 pm from September to June, excluding campus closures.

UNC 337 250.807.8421 (ext. 1)

Email: ipc.ok@ubc.ca **Web**: https://psych.ok.ubc.ca/psychology-clinic/walk-in-wellness/

Student Supports, Resources & Campus Services

Visit the Student Support and Resources page to find one-on-one help or explore resources to support your experience at UBC Okanagan, as well as many other campus services available to all students.

Advising Options

Visit the Advising Options page to find out about the variety of advising options available to students including but not limited to academic, career and accessibility.

Safewalk

Don't want to walk alone at night? Not too sure how to get somewhere on campus? Call Safewalk at 250-807-8076. **Web**: www.security.ok.ubc.ca