

PT 640: Management of Cardiovascular
and Pulmonary Systems
Fall 2024
Lecture: T 1-2; Th 1-3
Lab F 1-3



COURSE DESCRIPTION:

This course is designed to expand the theoretical understanding and clinical application of cardiopulmonary physical therapy examination, evaluation, diagnosis, prognosis, intervention and outcomes. Laboratory

CAPTE STANDARDS & ELEMENTS:

Standard 7: Elements 7A, 7B, 7C, and 7D

DEPARTMENT OFFERING THE COURSE:

UND School of Medicine and Health Sciences - Department of Physical Therapy

CREDIT HOURS: 3 Credit Hours

ABOUT THE PROFESSOR & CONTACT INFORMATION:

Nick Holkup, PT, DPT

Phone: (701)777-3861

Email: nicholas.j.holkup@und.edu

Office Location: UND-SMHS Suite E321, Room 324

Student Hours:

Tuesday 8am-12 pm

Thursday 8am-12 pm

Or by appointment

David Relling, PT, PhD

Phone: (701) 777-4091

Email: David.relling@und.edu

Office Location: UND-SMHS Suite E321, Room E343

Student Hours: By appointment

COURSE CONTACT HOURS:

Lecture: Tuesdays 1:00 PM – 2:00 PM; Thursdays 1:00 PM - 3:00 PM

Laboratory: Fridays 1:00 PM – 3:00 PM

COURSE PREREQUISITES:

Registered in the professional Physical Therapy program.

COURSE OBJECTIVES:

All goals included with CAPTE SRE's, Bloom's Taxonomy, and UND PT threads and goals

Upon completion of this course the student will be able to:

1. **Describe normal and pathological aspects of cardiopulmonary anatomy and physiology.** (7A, 7D- 7D1, 7D2) [Cognitive – Understand; Affective – Responding; Psychomotor -- Set]. Thread – Evidence-based Practice.
2. **Clinically apply cardiopulmonary anatomy and physiology to the physical therapy intervention of the client with primary or secondary cardiopulmonary impairments, functional limitations, and/or disabilities.** (7D4, 7D10) [Cognitive – Apply; Affective -- Organizing; Psychomotor – Guided Response] Thread – Clinical Decision Making; Evidence-based Practice
3. **Demonstrate an understanding of purposes and precautions for client monitoring and support equipment related to cardiopulmonary care. Discuss appropriate physical therapy interventions for inappropriate patient/client responses during a physical therapy intervention.** (7D10, 7D11, 7D14) [Cognitive – Apply; Affective -- Organizing; Psychomotor – Guided Response] Thread – Critical Inquiry, Evidence-Based Practice
4. **Demonstrate an understanding of cardiopulmonary procedures through development of medically appropriate exercise prescriptions and instructions. These instructions must be in a format that is appropriate for the age, language, and social status of the client.**(7D5, 7D6, 7D10, 7D11, 7D12) [Cognitive – Create; Affective -- Characterizing; Psychomotor -- Adaptation] Thread – JEDI, Clinical Decision Making, Evidence-Based Practice
5. **Demonstrate and articulate various pharmacological interventions for cardiopulmonary disorders including: type of medication, treatment effects, drug interactions, and side effects.** (7A) [Cognitive – Apply; Affective -- Responding; Psychomotor -- perception] Thread -- Pharmacology
6. **Perform a complete cardiopulmonary physical examination and recognize normal and abnormal signs and symptoms: observation, palpation, auscultation, heart & breath sounds, graded functional testing, percussion, peripheral circulation, ECG, chest mobility.** (7A, 7D1, 7D2) [Cognitive – Analyze; Affective -- Organizing; Psychomotor – Guided Response] Thread – Clinical Decision Making
7. **Summarize and recognize the performance criteria for an entry-level physical therapist in the examination, evaluation, diagnosis, prognosis, and intervention of clients demonstrating impairment, functional limitations or disabilities related to a primary or secondary cardiopulmonary disease process.** (7D) [Cognitive – Understanding; Affective -- Responding; Psychomotor -- Perception] Thread – Professionalism, Evidence-Based Practice
8. **Determine appropriate expected outcomes and prognoses of clients demonstrating impairment, functional limitations or disabilities related to a primary or secondary cardiopulmonary disease process.** (7D 5-9) [Cognitive – Evaluate; Affective -- Organizing; Psychomotor -- Mechanism] Thread – Clinical Decision Making

COURSE SCHEDULE AND OUTLINE OF CONTENT:

- See attached schedule

DESCRIPTION OF TEACHING METHODS AND LEARNING EXPERIENCES:

Teaching methods in this course include lecture, practical/lab, small group discussion, case scenarios, and critical thinking relative to case scenarios and projects. UND SMHS Simulation Lab will also be utilized for practical hands-on learning scenarios. Some portions of the class may also contain 'flipped' model, incorporating video content/lectures

COURSE MODE OF DELIVERY:

Synchronous, in-person

MATERIALS – TEXT, READINGS, & SUPPLEMENTARY READINGS:

Additional readings are highly recommended but are considered supplemental.

Hillegass, E. *Essentials of Cardiopulmonary Physical Therapy 5th ed.* (H)
ISBN: 9780323722124

Jarvis C. *Pocket Companion for Physical Examination and Health Assessment 8th ed.* (P)
ISBN: 9780323532020

O'Sullivan SB & Schmitz TJ. *Physical Rehabilitation 6th Ed.* ISBN 9781719646918 (SS)

American College of Sports Medicine. *ACSM's Guidelines for Exercise Testing and Prescription 11th ed.* ISBN 9781975150198 (G)

Additional Texts/Readings

DeTurk WE & Cahalin LP. *Cardiovascular & Pulmonary Physical Therapy: An evidence based approach, 3rd Ed.* ISBN 978-1-259-83795-1 (D)

NOTE: All readings from Hillegass and Jarvis are considered required

METHODS OF STUDENT EVALUATION:

Teaching methods in this course include lecture, practical, case scenario, and critical thinking relative to case scenarios and projects. The objectives contribute to the Practice Model Components of Patient Care: Screening\Evaluation\Progression\Discharge; Patient Care: Physical Therapy Intervention; Communications; and Education.

The written examinations will evaluate material, techniques, procedures and theory covered in lectures and laboratory sessions. The format of the exams may include, but are not limited to: multiple choice, true/false, multiple-multiple choice, matching, hot spot, short answer, essay, and patient problems. Failure to achieve a passing score (80%) on a practical exam will result in retaking the exam one time to demonstrate competence in the content area. Failure to achieve a passing score on the re-take practical exam will result in review by the departmental scholastic standards committee and possible dismissal from the program. The initial score on all exams will be retained for overall course grading purposes. Midterm and Final examinations are considered Summative examinations. Summative examinations require scores of 76% or higher to be considered passing. Students scoring less than 76% MUST retake the summative examinations and demonstrate proficiency at 76% or higher. The initial score on all exams will be utilized for grading purposes.

GRADING SCALE:

Exam I	20%
Exam II	20%

Exam III / Final	25%
Practical Exam I	10%
Practical Exam II	10%
Projects/Assignments	10%
Weekly Quizzes & Participation	5%

Grading Scale	Breakdown
A 90% to 100%	[Practical Exams – 20%] [Quizzes and Participation– 5%]
B 80% to 89.9%	[3 Exams – 65%]
C 76% to 79.9%	[Assignments – 10%]
F < 76%	

For more information on grading policies, please refer to the [UND-PT Scholastic Standards Document](#)

COURSE ACCESS & TECHNICAL REQUIREMENTS

This course was developed and will be facilitated utilizing Blackboard. For access go to: <http://blackboard.UND.edu> and log in with your NDUS.Identifier. If you do not know your NDUS Identifier or have forgotten your password, please visit [Your NDUS Account Webpage](#)

Visit the [UND Technical Requirements](#) webpage for more information. Students are expected to use their official UND email in the course. For technical assistance, please contact [UND Technical Support](#) at 701.777.2222

ARTIFICIAL INTELLIGENCE (AI)

Artificial Intelligence tools are allowed in this course as approved by the instructor(s). Students are required to disclose if they use AI-generated text or images and how they apply it in their work. Failure of students to acknowledge their use of AI or using fabricated information could result in their violation of the Academic Integrity Policy. Students must ensure the originality of their work, maintain academic integrity, and avoid any type of plagiarism. The students need to understand the material and complete assignments on their own, using AI tools as a supplement rather than a replacement for their work. Students should not use sources that are cited by AI tools without having read them because generative AI tools can either create fake citations or cite a real piece of writing, but the cited content may be inaccurate. The faculty reserves the right to use various plagiarism-checking tools in evaluating students' work, including those screening for AI-generated content, and impose consequences accordingly.

For more information on AIPolicies, please visit [Artificial Intelligence Resources](#).

UNIVERSITY OF NORTH DAKOTA POLICIES & RESOURCES:

Nondiscrimination

It is the policy of the University of North Dakota that no person shall be discriminated against because of race, religion, age, color, gender, disability, national origin, creed, sexual orientation, gender identity, genetic information, marital status, veteran's status, or political belief or affiliation and the equal opportunity and access to facilities shall be available to all. Concerns regarding Title IX, Title VI, Title VII, ADA, and Section 504 may be addressed to Donna Smith, Assistant Vice President for Equal Opportunity and Title IX/ADA Coordinator, 401 Twamley Hall, 701.777.4171, UND.EO.TitleIX@UND.edu or the Office for Civil Rights, U.S. Dept. of Education, 230 S. Dearborn St., 37th Floor, 500 West Madison, Suite 1475, Chicago, IL 60611 or any other federal agency.

The full [Notice of Non-discrimination](#) is available online through Equal Opportunity & Title IX.

Accessibility Statement

The University of North Dakota is committed to providing equal access to students with documented

disabilities. To ensure access to this class and your program, please contact <https://und.edu/student-life/student-disability-resources/index.html> to engage in a confidential discussion about accommodations for the classroom and clinical settings.

Accommodations are not provided retroactively. Students are encouraged to register with [Student Disability Resources](#) at the start of their program. More information can be obtained by email, UND.sdr@UND.edu, or by phone at 701.777.2100.

Religious Accommodations

UND offers religious accommodations, which are reasonable changes in the academic environment that enable a student to practice or observe a sincerely held religious belief without undue hardship on the University. Examples include time for prayer or the ability to attend religious events or observe a religious holiday. To request an accommodation, complete the [student religious accommodation request form](#). To learn more, please consult UND's [Religious Accommodations Policy](#) or contact the [Equal Opportunity & Title IX Office](#).

Pregnancy Accommodations

Students who need assistance with academic adjustments related to pregnancy or childbirth may contact the [Equal Opportunity & Title IX Office](#) or Academic Affairs to learn about your options. Additional information and services may be found at [Pregnancy Resources and in UND's Protections for Pregnant and Parenting Students and Employees Policy](#).

Reporting Discrimination, Harassment, or Sexual Misconduct

If you or a friend has experienced sexual misconduct, such as sex-based harassment, domestic violence, dating violence, or stalking, please contact the [Equal Opportunity & Title IX Office](#) or UND's Title IX Coordinator, Donna Smith, for assistance at 701.777.4171 or donna.smith@UND.edu.

You may also contact the Equal Opportunity & Title IX office if you or a friend has experienced discrimination or harassment based on a protected class, such as race, color, national origin, religion, age, disability, sex, sex characteristics, sexual orientation, gender identity, genetic information, pregnancy, marital or parental status, veteran's status, or political belief or affiliation.

Faculty Reporting Obligations Regarding Discrimination, Harassment, or Sexual Misconduct

It is important for students to understand that faculty are required to share with UND's Equal Opportunity & Title IX Office any incidents of potential sexual misconduct or of discrimination or harassment based on a protected class that they become aware of, even if those incidents occurred in the past or are disclosed as part of a class assignment. This does not mean an investigation will occur if the student does not want that, but it does allow UND to provide resources to help the student continue to be successful at UND. If you have been impacted by discrimination, harassment, or sexual misconduct, you can find information about confidential support services at the [Equal Opportunity & Title IX](#) webpage.

Health and Safety

UND is committed to maintaining a safe learning environment and asks students and instructors to be flexible when necessary to promote quality learning experiences.

Please do not attend an in-person class or lab if you are feeling ill or if you have been directed by health professionals to stay home.

- If you are not able to attend class or lab, please notify your instructor as soon as possible and discuss options for making up any missed work.
- If you will have an extended absence due to serious illness or other uncontrollable circumstances, you may request an absence notification through [Community Standards and Care Network](#).
- If your instructor is ill, they may need to cancel class or temporarily move your course to online delivery.

Please contact [Student Health Services](#) if you have health questions by calling 701.777.4500 or visiting myhealth.und.edu

The course schedule of content and the assigned instructor attached below.

PT640: Management of Cardiovascular and Pulmonary Systems

Schedule of Class Content

Lecture: Tues 1:00pm – 2:00pm ; Thrs 1:00pm – 3:00pm: **Lab** Fri 1:00pm – 3:00 pm

Date	Topic	Readings
8/27/24	Introduction to course; Pulmonary anatomy, physiology (NJH)	H: 1,2
8/29/24	Introduction to course; pulmonary physiology (DR)	H: 18
8/30/24	Pulmonary assessment (DR, NH)	J: 3, 9, 11
9/3/24	Pulmonary anatomy, physiology, assessment, and pathology (DR)	H: 6,7 G: 2, 3 (pp58-61), 4
9/5/24	Pulmonary pathophysiology, assessment, diagnosis, testing (DR)	H: 6,7 G: 2, 3 (pp58-61), 4
9/6/24	Pulmonary assessment (DR, NH)	J: 3, 9, 11 H: 23 (pp757-765)
9/10/24	Pulmonary pathology, assessment, diagnosis and testing (DR)	H: 12
9/12/24	Pulmonary assessment, diagnosis, testing and interventions (NH)	H: 12, 15, 17 G pp251-61
9/13/24	No class – interprofessional day	
9/17/24	Assessment, diagnosis, testing and interventions (NH)	H: 12, 15, 17 G pp251-61
9/19/24	Pulmonary assessment, outcome measures (NH)	H: 12, 15, 17, 19 G pp251-61
9/20/24	No Class – DR and NH both out	
9/24/24	Pulmonary interventions (DR)	H: 19
9/26/24	SIM LAB	
9/27/24	Pulmonary assessments, outcome measures, intervention (DR, NH)	H: 19, 21
10/1/24	Pulmonary intervention – rehab and exercise prescription (NH)	H: 21
10/3/24	Pulmonary intervention – rehab and exercise prescription (DR)	
10/4/24	Pulmonary application (DR)	H: 21
10/8/24	No class – IPE Conference day	
10/10/24	Exam 1 – Pulmonary (comprehensive)	
10/11/24	Practical Exam 12:00-4:00	
10/15/24	CV anatomy, physiology (NH)	H: 1, 2
10/17/24	CV anatomy, physiology, pathology (NH)	H: 1,2
10/18/24	CV exam and evaluation (NH)	J: Ch 3,4,12,13
10/22/24	CV Anatomy, Physiology, Pathophysiology (DR)	H: 3, 4, 5
10/24/24	CV Pathophysiology (NH)	H: 3, 4, 5

Date	Topic	Readings
10/25/24	No PT 640 Class – Mobility Lab	
10/29/24	CV Medical exam and evaluation (NH)	H: 10
10/31/24	EKG Lecture (NH)	H: 11
11/1/24	Cardio Vascular Examination (NH)	J Ch 3,4,12,13
11/5/24	EKG Lecture	H: 11
11/7/24	Exam II - CV anatomy, physiology, pathology, exam and eval, EKG	
11/8/24	Cardiac SIM lab	
11/12/24	Cardiac Medical Interventions (DR)	H: 13,14, 15
11/14/24	Practical Examination II	
11/15/24	Practical Examination II	
11/19/24	Cardiac Medical Interventions; Cardiovascular Drugs (DR)	H 13-16
11/21/24	Vascular System- anatomy, pathophysiology (NH)	H: 1, 2
11/22/24	Vascular system – anatomy, pathophysiology (NH)	H: 1, 2, 3
11/26/24	Vascular system – venous, lymph, wounds (NH)	H: 1, 2, 3, 24
11/28/24	NO CLASS – Holiday Break	
11/29/24	NO CLASS – Holiday Break	
12/3/24	GXT, Exercise Prescription (DR)	G: Ch 4-10 J: 13 SS: 14 H: 20
12/5/24	GXT, Exercise Prescription, Cardiac Rehab (DR)	
12/6/24	GXT, Exercise Prescription, Cardiac Rehab (NH)	
12/10/24	GXT, Exercise Prescription, Cardiac Rehab (NH)	
12/12/24	Review for Final Exam (NH)	
12/13/24	NO CLASS – Reading & Review Day	
Week of 12/16	FINAL EXAM WEEK	

Texts:

NOTE: All readings from Hillegass and Jarvis are considered required.

Hillegass E. *Essentials of Cardiopulmonary Physical Therapy 5th ed.* (H)

Jarvis C. *Pocket Companion for Physical Examination and Health Assessment 8th ed.* (J)

O’Sullivan SB & Schmitz TJ. *Physical Rehabilitation 6th Ed* (SS) **

American College of Sports Medicine. *ACSM’s Guidelines for Exercise Testing and Prescription 11th ed.* (G)

DeTurk WE & Cahalin LP. *Cardiovascular & Pulmonary Physical Therapy 3rd ed* (D) **

****Available via Access Physiotherapy through UND SMHS Library**