



Advanced Anatomy, Physiology and Pathophysiology I
CRNA 7300
Fall 2026

Scheduled Class Days and Times: See Course Schedule

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Instructor's Name: Jeffrey Pearl, M.D., F.A.C.S.

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Instructor's Name: Douglas Massey II, DNP, CRNA

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Course Description: This first course of a 3-course sequence will provide advanced content of anatomy, physiology, and pathophysiology. The lifespan from prenatal and embryology, infancy, childhood, adolescence, adulthood, and geriatrics will be covered.

Prerequisites:

- Admission to the DNP-NA Program

Student Learning Outcomes:

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

1. Understand the basic principles of biochemistry, including the structure and function of biomolecules such as proteins, lipids, carbohydrates, and nucleic acids.

2. Describe the anatomy of the musculoskeletal system, including bones, joints, muscles, tendons, and ligaments, with an emphasis on regions relevant to anesthesia practice.
3. Identify and describe the anatomical structures of the heart, including chambers, valves, coronary circulation, and conduction system.
4. Understand the anatomy of the major blood vessels, including arteries, veins, and capillaries, and their distribution throughout the body.
5. Describe the anatomical features of the lungs, including the bronchial tree, alveoli, pleura, and pulmonary vasculature.
6. Apply anatomical knowledge to clinical procedures such as regional anesthesia, nerve blocks, central line placement, arterial cannulation, and airway management.
7. Understand the principles of muscle contraction, joint movement, and the maintenance of posture and locomotion.
8. Explain the principles of cardiac function, including cardiac cycle, electrophysiology, cardiac output, and the Frank-Starling mechanism.
9. Understand the principles of blood flow, blood pressure regulation, and the role of the autonomic nervous system in cardiovascular control.
10. Describe the mechanics of breathing, gas exchange, oxygen transport, and the regulation of respiration.
11. Explain how the heart, cardiovascular, and pulmonary systems interact to maintain homeostasis and respond to physiological stressors, including anesthesia.
12. Understand the pathophysiology of musculoskeletal disorders such as arthritis, fractures, muscular dystrophies, and myopathies.
13. Understand the pathophysiological mechanisms of common cardiac conditions such as myocardial infarction, heart failure, arrhythmias, and valvular diseases.
14. Describe the pathophysiology of hypertension, atherosclerosis, and other vascular disorders.
15. Analyze the pathophysiological changes in respiratory diseases such as chronic obstructive pulmonary disease (COPD), asthma, pneumonia, and acute respiratory distress syndrome (ARDS).
16. Apply pathophysiological concepts to clinical case studies, enhancing critical thinking and decision-making skills in anesthesia care for patients with musculoskeletal, cardiac, pulmonary, and vascular conditions.
17. Apply molecular biology concepts to clinical case studies, enhancing critical thinking and decision-making skills in anesthesia care.
18. Use molecular knowledge to interpret diagnostic tests, such as blood gases, metabolic panels, and genetic tests.
19. Integrate molecular biology principles into the management of patients with metabolic, genetic, and molecular pathologies in the perioperative setting.
20. Understand the molecular mechanisms of anesthetic agents and adjunct drugs, including their metabolism, mechanism of action, and potential adverse effects.
21. Encourage engagement with current research and innovations in molecular biology that have implications for anesthesia practice.

Required Textbooks and Readings:

- **Primary Textbook:**
 - Dalley, A. F., & Agur, A. M. R. (2023). *Moore's clinically oriented anatomy*. (9th ed.). Lippincott
 - Hall, J. E., & Hall, M. E. (2020). *Guyton and Hall textbook of medical physiology*. (14th ed.). Elsevier.
 - Rogers, J. (2024). *McCance & Huether's pathophysiology*. (9th ed.). Elsevier
- **Additional Readings:**
 - N/A

Recommended Textbooks and Readings:

- N/A

Special Course Notes:

- 1) **Proctoring Notice:** Examinations in this course will be administered using Canvas' Respondus LockDown Browser and will be proctored by a faculty or staff member of The University of Texas at Tyler. Proctoring is required to ensure academic integrity and adherence to testing standards. Additional details regarding exam procedures, scheduling, and proctoring expectations will be provided in advance of each examination.
- 2) **Dress Code:** For non-lab/simulation activities, Nurse Anesthesia Residents (NARs) are expected to wear office or business casual attire. On days with lab/simulation activities, NARs may wear clean, solid-colored scrubs and must wear closed-toe shoes.
- 3) **Participation.** I invite you to engage, ask questions, and talk about the course content with your classmates. You can learn a great deal from discussing ideas and perspectives with your peers and professor. Participation can also help you articulate your thoughts and develop critical thinking skills.
- 4) **Time Management.** Try scheduling specific blocks of time and ensure you have enough room to finish assignments, allowing additional time for any tech issues that arise.
- 5) **PRACTICE!** Make use of your scheduled time in simulation to practice!
- 6) **Ask for help if needed.** If you are struggling with a course concept, reach out to your instructor(s) for support.
- 7) **Evaluations:** Course and instructor evaluations are required by the Council on Accreditation (COA) for Nurse Anesthesia Educational Programs. NARs must submit these evaluations at the end of each semester.

Assignments and Weights/Percentage/Point Values

1. Assignments	10%
2. Quizzes	10%
3. Written Examinations	20%
4. Midterm Practical Examination	10%
5. Final Practical Examination	25%
6. Final Written Examination	25%

Grading Scale:

Specific guidelines and grading criteria for all assignments are in the Modules. Final grades for the course will be determined based upon the following point assignments:

A - 90-100

B - 80-89

C - 70-79

D - 60-69

F - Below 60

Grades will not be rounded when calculating the average (79.5 is not rounded to 80, and 89.5 is not rounded to 90). The simple average of all unit exam grades, including a final must be at or above 80% to pass the course. Once the student has achieved a simple unit exam average of 80% or higher, course grades will be determined based on the weighted calculation of exams and other required course work. Students are required to achieve an average of 80% (B) to complete the course successfully.

Academic Integrity: Cheating of any kind, as defined in Section 8 of the UT Tyler Manual of Policies and Procedures (MOPP) for Student Affairs (<https://www.uttyler.edu/mopp/>), will not be tolerated. Consequences may include:

- reprimand
- exam failure
- course failure
- expulsion from the Nursing program
- expulsion from the University
- other consequences as assigned

Exam and homework materials, questions, and problems are the intellectual property of faculty, UT Tyler, or publishers.

- These materials may not be distributed without permission.
- Distributing or uploading them to online resources destroys the integrity of the assignment and the course, allowing others an unfair advantage by letting them view the materials.
- Uploading these materials to online resources is a violation of UT Tyler's academic misconduct policies and may result in formal conduct charges.
- Sanctions for uploading or otherwise divulging the contents of these materials can include:
 - a reduced or failing grade on an assignment
 - a reduced or failing grade for the course
 - removal from the Nursing program
 - removal from UT Tyler

Late Policy: NARs are expected to complete assignments and arrive on time for quizzes, OSCEs, and examinations. If a situation arises that would preclude the NAR from completing an

assignment or arriving on time for a quiz, OSCE, or examination, the NAR is expected to communicate with the instructor as early as possible to discuss alternate arrangements. Alternate arrangements are made at the discretion of the instructor. Failure to notify the instructor may result in a grade of zero (0%).

Repeating a Course: Students repeating this course may not use previously submitted assignments nor utilize the same patients for an assignment. Submitting the same or slightly modified assignments from previous semesters is considered self-plagiarism and is subject to academic discipline, including failing the assignment or the course.

Attendance and Make-up Policy: Punctuality and participation are essential; make-up opportunities for missing or late course requirements are at the discretion of the instructor.

Graded Course Requirements Information:

- **Assignments:** There will be 'Worksheets' designed to apply didactic knowledge. The assignments will account for 10% of the course grade.
- **Quizzes:** There will be quizzes scheduled throughout the semester; quizzes will be in-person and will be proctored by a faculty member or their designee. *No books, notes, or online resources are allowed to be used during quizzes, OSCEs, or exams.* The quizzes will account for 10% of the course grade.
- **Written Examinations:** There will be two (2) written examinations in the course; examinations will be in-person and will be proctored by a faculty member or their designee. *No books, notes, or online resources are allowed to be used during quizzes, OSCEs, or exams.* The written examinations will account for 20% of the course grade.
- **Midterm Practical Examination:** There will be one (1) midterm practical examination; this will involve the application of anatomical, physiologic, and pathophysiologic knowledge. *No books, notes, or online resources are allowed to be used during quizzes, OSCEs, or exams.* The midterm practical examination will account for 10% of the course grade.
- **Final Practical Examination:** There will be one (1) final practical examination; this will involve the application of anatomical, physiologic, and pathophysiologic knowledge. *No books, notes, or online resources are allowed to be used during quizzes, OSCEs, or exams.* The final practical examination will account for 25% of the course grade.
- **Final Written Examination:** There will be one (1) final written examination in the course; examinations will be in-person and will be proctored by a faculty member or their designee. *No books, notes, or online resources are allowed to be used during quizzes, OSCEs, or exams.* The final written examination will account for 25% of the course grade.

Please Note: Detailed information along with grading rubrics for course assignments will be provided in Canvas.

Important Course Dates:

Classes Begin: August 28, 2026

Census Date (withdraw without penalty): September 10, 2026

Last Date to Withdraw: November 4, 2026; Students please notify your course faculty and contact your advisor.

Written Examination 1: September 25, 2026

Midterm Practical Examination: October 9, 2026

Written Examination 2: October 30, 2026

Final Practical Examination: TBD

Written Final Examination: TBD

Calendar of Topics, Readings, and Due Dates: Please see Canvas for most up-to-date information.

Course Schedule					
Week	Date	Time	Faculty	Content	Reading(s)
1	08/28/2026	1300-1600	Pearl	Introduction to Anatomy & Brachial Plexus	See Canvas
	See Canvas	See Canvas	Warren	Cellular Biology & Biochemistry I	See Canvas
2	09/04/2026	0800-1000	Massey	Altered Cellular and Tissue Biology	See Canvas
		1300-1600	Pearl	MSK Anatomy – Upper Extremity I	See Canvas
	See Canvas	See Canvas	Warren	Cellular Biology & Biochemistry II	See Canvas
3	See Canvas	See Canvas	Pearl	MSK Anatomy – Upper Extremity II	See Canvas
	See Canvas	See Canvas	Warren	Physiology of Skeletal Muscle Contraction	See Canvas
4	09/17/2026	1200-1400	Massey	Alterations of Musculoskeletal Function	See Canvas
	09/18/2026	1300-1600	Pearl	MSK Anatomy – Trunk	See Canvas
	See Canvas	See Canvas	Warren	Pulmonary Physiology I	See Canvas
5	09/25/2026	0800-1000	Massey	EXAM 1	N/A
		1300-1600	Pearl	MSK Anatomy – Lower Extremity I	See Canvas
6	10/02/2026	1300-1600	Pearl	MSK Anatomy – Lower Extremity II	See Canvas
	See Canvas	See Canvas	Warren	Pulmonary Physiology II	See Canvas
7	10/09/2026	1300-1600	Pearl	MIDTERM PRACTICAL EXAM	N/A
	See Canvas	See Canvas	Warren	Pulmonary Physiology III	See Canvas
8	10/16/2026	0800-1000	Massey	Alterations of Pulmonary Function I	See Canvas
		1300-1600	Pearl	Pulmonary Anatomy I	See Canvas
	See Canvas	See Canvas	Warren	Pulmonary Physiology IV	See Canvas
9	10/22/2026	1200-1400	Massey	Alterations of Pulmonary Function II	See Canvas
	10/23/2026	1300-1600	Pearl	Pulmonary Anatomy II	See Canvas
	See Canvas	See Canvas	Warren	Cardiac Physiology I	See Canvas
10	10/30/2026	0800-1000	Massey	EXAM 2	See Canvas
		1300-1600	Pearl	Mediastinal Anatomy	See Canvas
11	11/06/2026	1300-1600	Pearl	Cardiac Anatomy I	See Canvas
	See Canvas	See Canvas	Warren	Cardiac Physiology II	See Canvas
12	11/12/2026	1100-1300	Massey	Alterations of Cardiovascular Function I	See Canvas
	11/13/2026	1300-1600	Pearl	Cardiac Anatomy II	See Canvas
	See Canvas	See Canvas	Warren	Cardiac Physiology III	See Canvas

13	11/20/2026	0800-1000	Massey	Alterations of Cardiovascular Function II	See Canvas
		1300-1600	Pearl	Vascular Anatomy	See Canvas
	See Canvas	See Canvas	Warren	Vascular Physiology I	See Canvas
14	11/27/2026	THANKSGIVING BREAK			
15	12/04/2026	0800-1000	Massey	Alterations of Cardiovascular Function III	See Canvas
		1300-1600	Pearl	Anatomy Review	N/A
	See Canvas	See Canvas	Warren	Vascular Physiology II	See Canvas
16	See Canvas	See Canvas	Massey	FINAL WRITTEN EXAM	N/A
	See Canvas	See Canvas	Pearl	FINAL PRACTICAL EXAM	N/A

Required Syllabus Language:

UT Tyler is committed to exploring and using artificial intelligence (AI) tools as appropriate for the discipline and task undertaken. We encourage discussing AI tools' ethical, societal, philosophical, and disciplinary implications. All uses of AI should be acknowledged as this aligns with our commitment to honor and integrity, as noted in UT Tyler's Honor Code. Faculty and students must not use protected information, data, or copyrighted materials when using any AI tool. Additionally, users should be aware that AI tools rely on predictive models to generate content that may appear correct but is sometimes shown to be incomplete, inaccurate, taken without attribution from other sources, and/or biased. Consequently, an AI tool should not be considered a substitute for traditional approaches to research. You are ultimately responsible for the quality and content of the information you submit. Misusing AI tools that violate the guidelines specified for this course (see below) is considered a breach of academic integrity. The student will be subject to disciplinary actions as outlined in UT Tyler's Academic Integrity Policy.

For this course, AI is encouraged during the course, and appropriate acknowledgement is expected. These programs can be powerful tools for learning and other productive pursuits, including helping you generate new ideas, identifying flaws in reasoning, and serving as a personalized learning tool. However, your ethical responsibilities as a student remain the same; you must follow UT Tyler's Honor Code and uphold UT Tyler's Academic Integrity Policy.

School of Nursing Policies and Additional Information:

https://www.uttyler.edu/nursing/college/student_guide_and_policies.php

Student Resources and University Policies are provided in Canvas.

- [Student Resources](#)
- [University Policy](#)