

University of Texas at El Paso
Biomedical Engineering
COURSE SYLLABUS

DRSC 6495 Anatomy for Rehab Sciences CRN: 26744 & 26745

Spring 2023

Credit Hours: 4

Contact Hours: 120

Schedule: Monday
 Lecture 1:00-1:50 pm Campbell B-32 (Basement)
 Lab 2:00-4:00 pm Campbell B-01 (Basement)
 Thursday
 Lecture 12:00-1:50 pm Campbell Rm 202
 Lab 2:00-5:00 pm Campbell B-01 (Basement)

Coordinator/Instructor:

Faculty: Dr. Bala Kathirvelu, MBBS, PhD
Office location: Campbell B01
Phone #: 915-747-7260
E-mail: bkathirvelu@utep.edu
Office hours: By email request and during dissection lab time
Laboratory Assistant: None

Course Description: A study of the structure and function of the skeletal, muscular, central and peripheral nervous systems of the human body. The course focuses on human anatomy through didactic methods and cadaver dissection of the trunk, extremities, head, neck, and internal organs.

Course Objectives: The student will acquire the standard anatomical nomenclature and anatomical knowledge needed to describe, explain, and discuss the musculoskeletal, nervous, and vascular systems of the human body. Upon completion of this course, the student should be able to identify all major anatomical structures discussed in lecture and demonstrated in the lab, and recall with authority the relationships between structures, including but not limited to:

1. The axial and appendicular skeletons.
2. The classifications and functional anatomy of the joints of the limb and vertebral column.
3. The functional anatomy of the muscles of the limbs, trunk, neck, and face.
4. The patterns of innervation of functional muscle groups and dermatomes.
5. The distributions and functions of spinal and cranial nerves.
6. The structure and function of the thoracic and abdominal walls.
7. The functional anatomy of the cardiovascular and respiratory systems.
8. The functional anatomy of the gastrointestinal, urinary, and reproductive systems.
9. Begin to synthesis anatomical knowledge to clinical situations.

Required Texts:

Moore KL, Agur AM. *Essential Clinical Anatomy*, 6th ed. New York: Lippincott, Williams & Wilkins; 2020. (or current edition)

Grant’s Dissector. 16th ed. Philadelphia: Lippincott, Williams & Wilkins; 2017. (or current edition)

Required Atlas: (ONE of the following)

Netter FH. *Atlas of Human Anatomy. 7th ed.*(or current edition) Philadelphia: Icon (Preferred)
Electronic book available at the [UTEP Library: Available online](#)

OR

Rohen JW, Yokochi C, Lütjen-Drecoll, E. *Color Atlas of Anatomy, 7th ed.* (or current edition)
Lippincott Williams & Wilkins; 2011.

Recommended Textbooks and Other Learning Resources:

Hansen JT. *Netter’s Anatomy Flash Cards, 5th ed.* (or current) Icon Learning Systems; 2018.

Additional Resources: <https://libguides.utep.edu/anatomy>

Methods of Instruction: Lecture, readings, laboratory demonstration and dissection.

Methods of Evaluation: Evaluation of course content will consist of written exams and laboratory practical exams. Exams are comprehensive within the module and will **NOT** be graded on a curve. A minimum average of 70% is needed to pass the course with a grade of “C.” Graded activities and their weight are as follows:

	Final grade
Module 1 Exam (Up Ext & Back):	25% (Theory 12.5% + Lab practical 12.5%)
Module 2 Exam (Thorax & Abd.):	20% (Theory 10% + Lab practical 10%)
Module 3 Exam (L. Ext & Pelvis):	25% (Theory 12.5% + Lab practical 12.5%)
Module 4 Exam (Head & Neck):	20% (Theory 10% + Lab practical 10%)
Quizzes	10% (2.5% each module)

Course grades will be assigned using the following scale:

<u>Letter Grade Scale</u>	<u>Numerical Grade Scale</u>
A	90-100
B	80-89
C	70-79
F	Below 70

Exams: There will be an examination at the end of each module. Exams consist of a written part (50%) and a laboratory part (50%) where you must identify structures pinned or tagged on cadavers, medical images, and bones. The final examination is **not cumulative**. Unless otherwise noted, only information from the textbook (*Essential Clinical Anatomy*) or the dissector (*Grant's*) will be recognized. (**Respondus software** will be used during all online exams and quizzes using locked down browser)

Quizzes: Quizzes may be given in the lecture, in the lab, or online. They are designed to keep you current and to get you used to the types of questions that you may be asked on Exams and Practical's.

In the event a student becomes ill and cannot be present for an examination or quiz, a doctor's excuse must be presented. Once approved, arrangements can be made to reschedule the examination.

The course is designed to encourage you to pace your learning properly- instead of waiting until the end of the module before beginning to study in earnest- a tactic that can seriously imperil a student's chances of successfully completing the course. The laboratory portion of each exam will cover all dissections which should have been completed by the time it is administered.

Students are on the honor system for examinations; however, irregularities on tests (i.e. cheating) observed by faculty, teaching assistants, and/or students will be immediately brought to the attention of the program directors. **Students are not allowed to have smartphones for computer exams.**

Grades will be posted on Blackboard in a timely fashion. Completed exams are kept in my office and may be reviewed after an email request.

Course Content: Refer to topic outline for specific content. In general, the course is outlined into four modules, as follows:

Module I: Back and Upper extremity

Module II: Abdomen & Thorax

Module III: Lower extremity & Pelvis

Module IV: Head and neck

Resources Available for Student Success:

Confidential Resources:

- **Center for Accommodations and Support Services (CASS):** If you have or suspect a disability and need accommodations, you should contact the Center for Accommodations and Support Services (CASS) at 747-5148. You can also e-mail the office at cass@utep.edu or go by their office in Union Building East, room 106 (next to the UTEP post-office). For additional information, visit the CASS website at <http://sa.utep.edu/cass>.
- **The UTEP Student Health Center:** Union East Suite 100; 915.747.5624; www.utep.edu/chs/shc
- **The UTEP Counseling and Psychological Services:** 202 Union West, 915.747.5302; www.utep.edu/student-affairs/counsel

Additional Resources:

- Division of Student Affairs. 915.747.5076, www.utep.edu/student-affairs
- DPT Library Research Guide: <http://libguides.utep.edu/pt>

- Writing Center: 915.747.5112. <https://uwc.utep.edu>
- Computer Labs: Independent Learning Center (ILC), 1st floor Campbell Building
- Military Student Success Center: 915.747.5342, www.utep.edu/student-affairs/mssc
- Student Wellness Program. 915.747.6738, www.utep.edu/chs/wellness

University Policies: All students are responsible for following UTEP policies and procedures found in the Handbook of Operating Procedures at www.utep.edu/vpba/hoop

Program Policies: All students are responsible for following all policies and procedures documented in the current DPT Student Handbook. Course policies found in the DPT Student Handbook apply to all courses in the DPT curriculum. The current DPT Student Handbook may be found on the DPT Student Resources site on Blackboard. https://www.utep.edu/chs/pt/Files/docs/Student%20Handbook%202025_02.pdf

Academic Integrity:

The UTEP DPT Program has a “zero-tolerance policy” for scholastic dishonesty. All students must demonstrate academic integrity at all times. The current DPT Student Handbook outlines specific definitions, expectations, details, and consequences related to academic integrity and scholastic dishonesty. Additional information related to academic integrity is available through the UTEP Division of Student Affairs at www.utep.edu/student-affairs/osccr/student-conduct/academic-integrity.html

Course-Specific Policies:

1. **Attendance Policy - Absences:** Refer to current DPT Student Handbook “Attendance and Classroom Behavior” for the DPT Program policy. Additional course-specific policy is as follows:
 - As a student enrolled in a professional program, it is also expected that every student will be seated and attentive as soon as class begins. Tardiness is unprofessional and impacts your fellow peers by interrupting the classroom dynamics.
 - An attendance sheet will be circulated at the end of some lecture randomly for your signature.
 - If you miss a class, you must contact your instructor via email: **bkathirvelu@utep.edu** within 24 hours of the missed class.
 - If you miss a class, you are responsible for the material that was covered in lecture, and any announcements that were made in class that you missed.
 - There will be no make-up exams unless arrangements are made prior to the scheduled date, or in the case of an unforeseen emergency situation.
 - Missed exams will be entered as a zero grade unless the student has made prior arrangements with the instructor.
 - The instructor will endeavor to arrange a convenient make-up date for both of our schedules.
 - Make-up quizzes and exams will cover the same content, but the format of the test may be different.
 - It will not be the policy of this instructor to routinely allow students to take advantage of missing quizzes and exams with the expectation that they will be able to make up the work later.

- I consider extraordinary circumstances worthy of an excused absence to include: military duty, jury duty, documented hospitalization, documented illness, funerals, and/or religious observations.
2. **Attendance Policy - Tardiness & Early Departures:** Refer to current DPT Student Handbook “Attendance and Classroom Behavior” for DPT Program policy.
https://www.utep.edu/chs/pt/Files/docs/Student%20Handbook%202025_02.pdf
 3. **Electronic Devices:** Refer to current DPT Student Handbook “Electronic Devices” for DPT Program policy. Additional course-specific policy is as follows:
 - All cell phones must be turned off, or placed on vibrate, before the beginning of class. Cell phones can be disruptive and a distraction during valuable lecture time which can negatively impact all the students in the class.
 - Cell phones may not be used to photograph quizzes or exams. Exams are returned to the student for inspection, but they must be turned in before you leave class. They are filed and kept by the instructor until after graduation.
 4. **Professional Behavior Policy:** See DPT Student Handbook “Attendance and Classroom Behavior”, “Professional Behaviors” and “Unprofessional Behavior:” for general program policy. https://www.utep.edu/chs/pt/Files/docs/Student%20Handbook%202025_02.pdf
 5. **Late or Missed Assignments and Assessments Policy:** See current DPT Student Handbook “Written Examination Policy”.
 - Your evaluation will be based on your performance on exams and quizzes conducted in the class
 - Quizzes will consist of questions given at the beginning of class covering the material from the previous class(es) as an online quiz.
 - In-class quizzes will be given at the start of class (first 10-15 minutes).
 - If you are late to class you will only have the remaining time (of the test time) to complete the quiz.
 - If you miss the quiz entirely you will receive a zero.
 - In the case of an excused absence from class, the student and instructor will coordinate a make-up time convenient to both our schedules AND within a short window of time.
 - An unexcused absence resulting in a missed exam will result in a grade of zero on that exam and no make-up will be given.
 6. **Skills Check Policy: NA**
 7. **Practical Exam Policy:**
 - Refer to the DPT Student Handbook “Practical Exam Policy” for details.
https://www.utep.edu/chs/pt/Files/docs/Student%20Handbook%202025_02.pdf

Course Content and Schedule: (Note: Students will be notified of changes via Blackboard or email. Additional details may be available in supporting course documents provided by the course instructor).

Special Note: The Lectures follow your textbook but will be the highlights of the material. You will need to memorize much material, and study groups are helpful. Chapter readings before the

lecture will be helpful to familiarize yourself with the material and any unfamiliar terms. I will be emphasizing the material that is most important.

- The PowerPoint slides presented in the lecture will be available on Blackboard.
- As a pre-professional enrolled in a professional graduate degree program, it is expected that every student shows respect to each other, in the same way that we would show our respect to patients, clients, and peers and other professionals in our field or in any interdisciplinary field with whom we interact.
- Employ and practice your soft skills in this course: showing commitment, time management, positive attitude, motivation, flexibility, persistence and perseverance, empathy, punctuality, strong work ethic, self-awareness, staying calm in a difficult situation, and accepting responsibility, to list a few.
- This course contains a large quantity of material that must be committed to memory. Students should endeavor to study to keep current with the schedule of topics.
- It is a very helpful tool to study in small groups and quiz each other on the material.
- The quizzes and examinations are created to measure your knowledge of the important topics presented during the lecture or assigned as reading in the textbook.
- Experiment with your personal learning style.
- Please contact me with any concerns, questions, and requests as soon as possible so that I may address it/them immediately.

Lecture:

Major anatomical topics are covered, but students are additionally responsible for assigned readings in the textbook. Occasionally, handouts and other study materials will be distributed in the lecture or via Blackboard.

Laboratory:

In the laboratory, the students are organized in groups of approximately 6-10 and perform a whole body dissection following instructions found in Grant's dissector. During dissections, students are assisted by the instructor and lab assistant. Students are responsible for all dissected structures, not only from their own dissections but also in cadavers dissected by others and all bones of the human skeleton including their major topography.

Laboratory Requirements, Rules, and Regulations:

Laboratory attendance is **MANDATORY** and must be completed along with the lectures to pass the course.

The laboratory is NOT open to anyone except DPT and MOT students that are enrolled in the course. No family members or friends are allowed in the lab; failure to abide by this rule will lead to failure and dismissal from the course.

Laboratory attire:

Scrubs are not required but are recommended; old clothes in good condition (no holes, etc) are equally as acceptable. Closed-toe shoes must be worn in the dissection laboratory at all times. Gloves (*provided*) are required for all dissections. Aprons (*provided*) should be worn. Eye protection (*provided*) is required. Masks are available but are only necessary when we are cutting bone because of the bone dust generated. (*Consult your department if they provide masks and face shield during face to face interaction during dissections. Its highly recommended you bring your protective masks and shields during lab hours*).

Dissection Instruments (required and provided):

- Mayo-pattern dissection scissors 5 ½"

- Sharp/Sharp scissors 4 ½”
- Scalpel handle, Bard-Parker #3
- Scalpel blades, Bard-Parker #10
- Humber Probe
- Flexible Probe
- Forceps Sharp, 5 ½”
- Kelly Hemostat 5 ½”

Bone Boxes (provided):

Each group will be assigned a numbered bone box, with the bones of one half of a human skeleton, for the study of osteology during the laboratory portion of this course. As a group, you will be responsible for the appropriate use, maintenance and safe return after usage. The bones boxes cannot be taken outside the lab except with permission from your instructor.

Bone boxes are to be stored in the cabinets provided. Cabinet keys will be issued to the group. If the bone box is returned with broken or missing pieces a repair/replacement cost will be determined and divided equally among the group members.

Sample replacement costs (these are estimated – students will be responsible for the actual replacement costs):

Skull	\$800	Pelvis	\$150
Clavicle	\$30	Complete Box	\$2300

Hazardous Chemicals:

The hazardous or potentially hazardous chemicals to which you are exposed in the gross anatomy laboratory are the components of the embalming fluid and the wetting solution. A list of these components follows. The MSDS sheets are available to you pursuant to 29 CFR, 1910.1200, the OSHA Hazard Communication Standard and are housed in the gross anatomy laboratory.

1. Embalming Fluid- The fluid contains formaldehyde, glutaraldehyde, glycerine, phenol, alcohol, and water. Formaldehyde is a suspected carcinogen and respiratory irritant. In addition, skin irritation may occur with prolonged exposure.
2. Phenol- This chemical is used on occasions for fungicidal purposes and is a respiratory toxin and skin irritant.
3. Mold-X- This detergent is used for fungicidal purposes and the active ingredients are formaldehyde and methanol. Formaldehyde is a suspected carcinogen and respiratory irritant.
4. Ethanol- The fluid in the bottom of the dissecting tables is 50% ethanol in water. The sheet edge is in contact with this fluid and will ‘wick’ up and help keep the cadaver moist.

A Note about Chemicals:

Some of the chemicals used to “fix” the cadavers are teratogenic. Please consult with your doctor if you are pregnant as these chemicals could cause birth defects. We will require an informed consent from you, the baby’s father, and your doctor if you choose to take DRSC 5495 while pregnant due to the possible danger to your unborn child. If not pregnant, please take measures to remain that way throughout the Fall semester.

Student Considerations:

The purpose of this section is to inform you of the hazardous chemicals and conditions that you may be exposed in the gross anatomy laboratory. Exposure is defined as personal contact with the hazardous or potentially hazardous chemicals at levels with an average eight hour time

weighted average, set for by the American Conference of Governmental Industrial Hygienist or OSHA's Permissible Exposure Limit (PEL) when used in a manner consistent with usual laboratory procedures. This includes inhalation of the ambient laboratory air and skin contact as the anatomical specimens are handled.

Skin: Protective clothing such as long sleeves and pants or hospital scrubs is strongly recommended. The use of latex or non-latex gloves is required for long term handling of the cadaver structures and gloves will be provided during lab time.

A student who has or develops skin sensitivity to the anatomical specimens should also wear long-sleeved garments at all times. In addition, the student should notify the instructor and their physician so that appropriate procedures can be implemented. Students exhibiting contact sensitivity should consult a physician regarding type of gloves, garments, or other items that may cause irritability.

Eyes: Accidental fluid splashed into the eyes should be flushed immediately using the eyewash station located in the laboratory, under the FIRST-AID cabinet, and a physician consulted. Questions concerning the effects of any of the above chemicals on eye tissues while wearing contact lenses or on the lenses themselves should be directed to your ophthalmologist and/or optometrist.

Respiratory: Individual students may have or develop sensitivity to any of the chemicals used in the laboratory, in particular formaldehyde or phenol. In order to obtain a respiratory protective device (respirator), a student must have a respiratory evaluation by a physician, after which s/he is fitted and trained in its proper care by their physician. A particle filter mask provides no protection for formaldehyde or phenol sensitivity.

Pregnancy:

Students who are or who learn they are pregnant or who are nursing newborn infants while using gross anatomy laboratories should consult their obstetrician immediately regarding recommended precautions.

Rules and Regulations

1. These cadavers were obtained for anatomical study. These cadavers were unselfish and concerned individuals that had the foresight to contribute to the education of students. ***The anatomical specimens studied must be handled with respect and dignity at all times.***
2. Cameras in the lab will be used by Dr. Bala Kathirvelu. Otherwise, no cameras, pictures or video of the cadavers are allowed, including on camera phones.
3. No cadaver tissue is to be taken outside of the laboratory at any time.
4. Eating or drinking is not permitted in the laboratory.
5. If there is a suspicion that a donor may be a relative or acquaintance of a student, the student should contact Dr. Bala Kathirvelu.
6. The cadavers are identified by numbers and those numbers correspond to their dissection table/tanks. Therefore, anatomical specimens should never be removed from their

corresponding tank and waste products should be deposited in the corresponding bin. These bins are only for body parts and are not general trash cans.

7. Used paper towels and used gloves are to be deposited in the appropriate “chemical waste” containers and not left in the tanks. (Tanks should be cleaned at the end of each laboratory session.)
8. Garments worn in the laboratory must include long pants. Shoes worn in the lab must adequately protect the top of the foot and be closed at the toes. All persons handling cadavers are required to wear gloves, masks and protective eyewear.
9. No radios, MP3 players, or electronic devices (including cell phones) are allowed in the lab at any time.
10. Any injuries incurred in the laboratory should be reported immediately to Dr. Bala Kathirvelu or a TA. To ensure a proper record of these events, an incident and injury form must be completed at the time of injury.
 - A. Minor cuts and abrasions from cutting instruments or bone edges should be washed thoroughly with antibacterial soap and hot water (Found in the FIRST-AID cabinet). Contact a member of the laboratory staff or Dr. Bala Kathirvelu for antiseptic and dressing materials.
 - B. In case of a serious emergency call 911 (serious wounds should be treated by a physician immediately.)
11. Only students enrolled in this class are allowed in the cadaver lab.
12. At the beginning of the course, students are only allowed in the cadaver lab when Dr. Bala Kathirvelu or one of the lab TA's are present. Later, after you are familiar with the equipment, you will be allowed to enter the lab without Dr. Bala Kathirvelu or a TA for study only. You are not allowed to dissect if Dr. Bala or a TA is not present. You must be accompanied by at least one other enrolled student- **do not enter the lab alone**.

Tentative Topic outline: Please review the topics prior to the class. The more prepared you are before lab, the easier your dissections will be to identify the structures.				Spring 2023 Anatomy for Rehab Sciences Lecture & Lab Course Sched	
	D a y	Date	Topic	Grants Dissector	Moore Text
Upper extremity & Back	T	19-Jan	Introduction, & UL osteology	Meet the cadaver	Refer to corresponding topics
	M	23-Jan	Pectoral & Axilla	Upper limb and scapular region (Refer to corresponding topics)	
	T	26-Jan	Arm & Cubital Fossa		
	M	30-Jan	Forearm (Flexors)		
	T	2-Feb	Forearm (Extensors) and Hand		
	M	6-Feb	Post shoulder & Axilla		
	T	9-Feb	Back & UE continued		
	M	13-Feb	Back & Joints, Review		
	T	16-Feb	EXAM 1 (Upper Extremity)		
Thorax, Abd	M	20-Feb	Abd wall & Viscera, Inguinal region	Thorax & Abdomen (Refer to corresponding topics)	Refer to corresponding topics
	T	23-Feb	Spine/ Post. abdominal wall / Diaphragm		
	M	27-Feb	Thoracic wall and Mediastinum		
	T	2-Mar	Thoracic Viscera		
	M	6-Mar	Thorax & Abd Review		
	T	9-Mar	EXAM 2 (Thorax and Abd)	Theory& Pract 2	
Lower extremity & Pelvis	M	20-Mar	Pelvis & Pelvic viscera	LE & Pelvis (Refer to corresponding topics)	Refer to corresponding topics
	T	23-Mar	Anteior/ Medial Hip & Thigh		
	M	27-Mar	Hip, Gluteal region and posterior thigh		
	T	30-Mar	Leg & Ankle		
	M	3-Apr	Foot & Lower Extremity joint		
	T	6-Apr	LE joints/ Perineum		
	M	10-Apr	Perineum & Urogenital region		
	T	13-Apr	LE continued & Review		
	M	17-Apr	EXAM 3 (Lower extremity & Pelvis)	Theory& Pract 3	
Head & Neck	T	20-Apr	Face & Neck	Head & Neck (Refer to corresponding topics)	Refer to corresponding topics
	M	24-Apr	Deep face, TMJ, Orbit & Ear		
	T	27-Apr	Deep Face, TMJ, Neck, Orbit & Ear		
	M	1-May	Skull & Cranial Nerves		
	T	4-May	Brain & Review		
	M	8-May	EXAM 4 (Head & Neck)	Theory&Pract 4	
Topics and dates subject to change as needed					