

# Gross Anatomy II Syllabus

## Spring 2012

**Course Number and Name:** AN2746 Gross Human Anatomy and Embryology Trimester II

**Course Hours:** Lab: Monday 3-5 p.m., Wednesday 1-3 p.m., and Friday 2-4 p.m.  
(Turley Anatomical Building)

Lecture: Monday 10 a.m-11 a.m. (L-205), Tuesday 9-10 a.m. (L-205), Thursday 10-11 a.m. (L-205), and Friday 9-10 a.m. (R-205)

**Course Credits:** 7

**Course Hours:** 150 Hours (Lecture 4 hours, Lab 6 hours)

### Contact Information:

**Course Instructors:** Robert E. Routh, Ph.D and Patricia J. Moore, D.O.

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Office Hours – days / time: Monday – Friday 9:00 a.m. – 5:00 p.m.

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### Course Materials:

#### Required Readings / Texts and or Articles:

##### Text:

Title: Clinically Oriented Anatomy

Author: Keith L. Moore et al.

Edition: 6<sup>th</sup> Ed.

Publisher: Lippincott Williams & Wilkins

Date of publication: 2010

Title: The Developing Human: Clinically Oriented Embryology

Author: Keith L. Moore & T.V.N. Persaud

Edition: 8<sup>th</sup> Ed.

Publisher: Saunders

Date of publication: 2003

#### Suggested Readings / Texts:

##### Text:

Title: The Atlas of Anatomy

Author: Frank H. Netter, M.D.

Edition: 4<sup>th</sup> Ed.

Publisher: Saunders

Date of publication: June 2006

### **Course Description:**

Gross anatomy of the human body considering the thoracic cavity and wall, heart, lungs, mediastinum, the abdomen, including the abdominal wall, GI tract, accessory organs, blood & nervous supply, pelvis, including the renal system, male and female anatomy, and neck, face, head, and cranial nerves. The laboratory portion of the course covers cadaver dissection. Correlations will be made to various clinical presentations using a computer case-based program and instructor presentation of cases. The cases will emphasize clinical presentations related to Gross Anatomy II with contributions from other courses in trimester two when appropriate. Additionally this course will cover embryologic development of the head & neck, nervous system, respiratory system, cardiovascular system, digestive system, renal system, urinary system, reproductive system, and bone marrow hematopoiesis of the human body. This course will also emphasize congenital birth defects that the chiropractor may be presented with in a clinical setting.

**Prerequisite:** Gross Anatomy and Embryology I

### **CCE / TCC Competencies:**

Human gross anatomy and embryology II is designed to bridge the basic science principles of human anatomy to the essential chiropractic tools of:

- physical exam
- neuromuscular skills
- diagnoses of disease
- chiropractic adjustment or manipulation

Therefore, the student must master each anatomical system being cognizant of its clinical applications.

### **Learning Outcomes:**

1. Integrate knowledge of gross anatomy with different clinical presentations.
2. Demonstrate the relevance of anatomy to clinical application.
3. Acquire requisite anatomy knowledge as a foundation for clinical reasoning.
4. Acquire requisite knowledge of embryological development and associated clinical anomalies.

### **Learning Objectives:**

In order for the student to achieve the above learning outcome the student will need to:

1. Delineate the anatomical regions of the face, scalp and associated landmarks, nerves, vascular supply and their clinical relevance.
2. Describe the boundaries, content and muscles of the triangles of the neck.
3. Describe the boundaries and content of the temporal fossa.
4. Identify the parotid gland and its associated structures and functions.

5. Describe the temporomandibular joint and its associated structures and functions and its clinical relevance.
6. Describe the course of the trigeminal nerve and its branches and identify their functions and its clinical relevance.
7. Describe the course of the maxillary artery and its branches and indentify the area supplied by the artery.
8. Describe the features of the cranial vault.
9. Describe the boundaries, components, muscles, vasculature, and nerve supply of the mouth, tongue, pharynx, larynx and trachea and their clinical relevance.
10. Describe the components, boundaries, vasculature, drainage, and nerve supply of the nasal cavity and the paranasal sinuses and their clinical relevance.
11. Identify the muscles, nerves, and vascular supply of the neck and their clinical relevance.
12. Identify the location of the thyroid and parathyroid glands and describe their function and their clinical relevance.
13. Identify and describe the structures and function of the structures/nerve pathways within the brainstem and cerebellum
14. Describe the classic brainstem syndromes: Parinaud's, Benedickt's, Claude-Weber, Millard-Gubler, Midpontine Base Syndrome, Foville's, Dejerine's and Wallenberg's
15. Identify and describe the anatomical pathways and function of the cranial nerves and the major clinical manifestations of their disruption.
16. Describe the boundaries and content of the thorax.
17. Identify and describe the location and function of the components of the respiratory system and describe their clinical relevance.
18. Identify and describe the location and function of the components of the heart and describe the clinical relevance. .
19. Describe the conduction system of the heart and identify the corresponding heart sounds.
20. Describe the different divisions of the mediastinum and what structures are within each section.
21. Identify the boundaries, landmarks and content of the abdomen.
22. Identify the location and components of the inguinal canal.
23. Identify the different types of hernias.
24. Identify and describe the anatomy, blood supply, nerve supply and function of the esophagus, stomach, and intestines.
25. Briefly describe the following clinical problems associated with the gastrointestinal tract: GERD, strictures, ulcers, hernia, diverticulosis, obstruction, Merckel's diverticulum, enteritis, Hirschsprung's disease, appendicitis, cirrhosis, portal hypertension, splenomegaly, and gallstones.
26. Identify and describe the anatomy, blood supply, nerve supply and function of the spleen, pancreas and associated ducts, liver, and gall bladder.
27. Identify and describe the anatomy, blood supply, nerve supply and function of the kidneys, ureters, urinary bladder and urethra and identify the clinical relevance.

28. Identify the structures that either form or are associated with the pelvis and describe their function.
29. Differentiate between the male and female pelvis.
30. Identify the structures associated with the male reproductive system and describe their function and clinical relevance.
31. Identify the structures associated with the female reproductive system and describe their function and clinical relevance.
32. Describe the embryological development and associated congenital anomalies of each of the organ systems discussed in their course.

### **Teaching Philosophy:**

“Repetition is the key, the key is repetition”. This statement was forever expressed by Dr. O’Callahan at LSUHSC in Shreveport, LA while I was working towards my Ph.D.. The longer I teach the more convinced I see of this truth. During my class I will briefly teach you the process of learning. It will be covered in more detail in your neuroanatomy course. However, to go from short term, to intermediate, and finally long term memory the mind must “hold” information in a cognizant state for an extended period of time. This is why there is so much overlap between classes. Due to the physiology of learning I incorporate a “progressive” teaching style where every system is added to the next. In short, students in Gross Human Anatomy II will be continually tested on concepts from Gross Human Anatomy I. We will begin with the superficial back, then walls of the thorax and superficial back, then walls of the abdomen, walls of the thorax and superficial back, then upper & lower extremities, walls of the abdomen, walls of the thorax and superficial back. Then in the next semester these topics will once again be added to those specifically taught in that section.

Therefore, it is essential for the students to continually review previous anatomical systems in order to retain their knowledge. In addition, it is helpful if students will read the lectures before class. In that way, the student is not seeing the information for the first time. This will save the student a great deal of time studying and reviewing. By the end of Gross Human Anatomy I & II the student will be able to go into their other courses with confidence to learn physical exam, neuromuscular skills, diagnoses of disease, and chiropractic adjustment or manipulation.

### **Student Responsibilities:**

The student has the responsibility of attending to their own learning and taking responsibility for their grade. The student should show up to class on time prepared to learn. Last, but not least, treat all your fellow classmates with respect. Your professor is here to help you.

### **Course Content and Outline:**

The following is a weekly *guide* to the topics covered throughout the semester. It also shows when the exams will be given. Keep in mind that all tests are cumulative.

### **Week 1: Orientation and Repeat of Final Exam from Gross Anatomy I as Exam 1**

**Weeks 1, 2, & 3: Cranial Vault:** This lecture will describe the features of the cranial vault, e.g., fosses, foramina, and name the major structures that are contained by or pass through these structures.

**Scalp & Skull:** This lecture will delineate the region of the scalp, and describe its various layers, describe the blood supply, venous, and lymphatic drainage patterns of the scalp, name the bones of the skull and describe their articulations, name the major sutures of the skull and locate the fontanelles of a neonate skull, and locate important features associated with the individual cranial bones, e.g., foramina, processes, etc.

**Superficial Face:** This lecture will delineate the anatomical regions of the face, scalp and associated landmarks, specifically name the cutaneous innervation of the face, name the subdivisions of the trigeminal nerve, designating which divisions are sensory and which division possess a motor component, describe the *clinically significant muscles of facial expression* innervated by the facial nerve. This lecture will also describe the course of the motor branches of the facial nerve, discuss the facial features associated with Bell's palsy, describe the lymphatic drainage from the scalp and facial regions, describe the origin of the arterial blood supply to the face and name the specific branches of the facial artery, and finally describe the venous drainage of the face and its association with the ophthalmic veins.

**Cranial Nerves:** This lecture will name and designate the 12 cranial nerves, discuss the important functional components of each cranial nerve, discuss each cranial nerves pathway through the skull, and clinical manifestations of their disruption.

**External Brainstem Structures:** This lecture describes the boundaries and major subdivisions of the brainstem, distinguishes external features associated with each segment of the brainstem, describes the structural features of the rhomboid fossa, names of the cranial nerves and their point of exit or entry into the brainstem, describes the major internal structures including the location and functional classification of the various cranial nerve nuclei. It also describes the clinically important sensory pathways that traverse the brainstem, i.e., dorsal column - medial lemniscal pathway, dorsal and ventral trigeminothalamic tracts, the anterolateral system (spinothalamic tracts) and the spinocerebellar pathways. Finally, this lecture describes the somatotopic arrangement (topology) of the fiber bundles of the medial lemniscus, trigeminothalamic tracts, medial longitudinal fasciculus and anterolateral system (spinothalamic tracts) in the brainstem.

**Internal Brainstem Structures:** This lecture describes the major internal structures including the location and functional classification of the various cranial nerve nuclei. Describes the clinically important sensory pathways that traverse the brainstem, i.e., dorsal column - medial lemniscal pathway, dorsal and ventral trigeminothalamic tracts, the anterolateral system (spinothalamic tracts) and the spinocerebellar pathways. Describes the somatotopic arrangement (topology) of the fiber bundles of the medial lemniscus, trigeminothalamic tracts, medial longitudinal fasciculus and anterolateral system (spinothalamic tracts) in the brainstem. Describes the somatotopic arrangement and position of the fiber bundles of the clinically important corticobulbar and corticospinal tracts in the brainstem. Describes the relative positions of the fiber bundles comprising the cerebellar peduncles. Describes the classic brainstem syndromes: Parinaud's, Benedickt's, Claude-Weber, Millard-Gubler, Midpontine Base Syndrome, Foville's, Dejerine's and Wallenberg's

**Neck & Cervical Triangles:** This lecture will discuss the triangles of the neck, their boundaries and contents, the superficial muscles of the lateral neck region, the muscles of the anterior neck region, e.g., strap muscles, and provide their attachments and innervations, and describe the fascia of the neck and discuss its clinical importance.

**Weeks 4 & 5: Temporal Fossa, Parotid Region, & TMJ:** This lecture will describe the temporal fossa, its boundaries and contents, discuss the structures forming the "parotid bed", describe the parotid gland, and name the structures embedded either within the gland or positioned in very close proximity to it, describe the temporomandibular joint with all its associated structures: the capsule, ligaments, nerves, blood vessels, and lymphatic drainage, describe and trace the course of the mandibular division of the trigeminal nerve (CN V<sup>3</sup>), its branches and function of each branch, describe and trace the maxillary artery and be able to describe the area and structures supplied by each branch.

**Infratemporal Fossa:** This lecture will describe the infratemporal fossa, its boundaries and contents, and the associated structures in this area, including the "stirrup" and major blood vessels in this region.

**Week 5 & 6: Oral Cavity, Pharynx/ Deep Neck & Visceral Structures:** This lecture will discuss the boundaries, components, muscles, vasculature of the mouth, the structure, vasculature, and sensory innervation of the tongue, the components, boundaries, vasculature, and nerve supply of the nasal cavity, the paranasal sinuses, their drainage, blood and nerve supply, the boundaries, components and nerve and blood supply of the pharynx, the components of the larynx and trachea, the musculature, nerves, arteries, and veins of the deep neck, and the position and function of thyroid and parathyroid glands.

### **Week 6: Embryology of the Head and Neck, and Nervous System**

**Week 7: Anterior Thoracic Wall:** This lecture includes the boundaries of the thorax, the bony thorax and the bones which comprise it, thoracic wall, musculature, osteology, VAN, and lymphatics of the thorax.

**Lungs and Pleura:** This lecture includes the trachea, bronchial tree, lungs, pleura, bronchopulmonary segments, lymphatics, blood circulation, mechanisms of respiration, and clinical applications.

**Week 8: Pericardium & Heart:** This lecture includes pericardium, pericardial sinuses, heart surfaces, chambers of the heart, heart sounds, conducting system, nerve supply of the heart, coronary arteries & veins, and vascular disease.

**Mediastina:** This section involves the different divisions of the mediastinum and what structures are within each section.

### **Embryology of the Cardiovascular system & Case Study**

**Week 9: Anterior Abdominal Wall, Peritoneal Cavity, & Inguinal Cavity:** These lectures will discuss the boundaries of the abdomen, the major landmarks of abdomen, the abdominal planes, regions, and quadrants, layers of the abdominal wall, muscles of the abdomen, their actions, and nerve supply, components of the rectus sheath, blood supply, venous drainage, nerve supply, and lymphatic drainage of abdominal wall, components of the inguinal canal, different types of hernias, intraperitoneal and retroperitoneal organs, the spaces and recesses of the peritoneal cavity and the peritoneal ligaments, contents of the median, medial, and lateral umbilical fold.

**GI tract:** This lecture will discuss the anatomy, blood supply, and nerve supply of the esophagus, the clinical problems associated with the esophagus, including GERD and constrictions, the anatomy, blood and nerve supply to and lymphatics from the stomach, the clinical problems associated with the stomach, including gastric ulcers, the components of the small intestine and

their anatomical differences, the blood and nerve supply to the small intestine and the lymphatic drainage, and the anatomy and blood and nerve supply to and lymphatic drainage from the components of the large intestine.

### **Week 10: GI Tract** (continued).

**GI Accessory Organs:** This lecture will discuss the anatomy of the spleen and its blood supply, the anatomy of the pancreas, its blood supply and ducts, the anatomy of the liver, its surface landmarks, and ligaments, the classical and functional lobes of the liver and its blood supply and bile drainage, the structure of the gallbladder and the cystic duct, the following clinical problems of the GI system: Hiatal hernia, Colonic diverticulosis, Bowel obstruction, Meckel's diverticulum, Regional enteritis, Hirschsprung's disease, Appendicitis, Cirrhosis of the liver, Portal hypertension, Splenomegaly, Gallstones.

### **Embryology of the Digestive System & Case Study**

### **Week 10: Pre-Exam Review, Exam, and Post-Exam Review**

**Week 11: Renal:** This lecture considers the important functions of the kidney, the location of the kidney in the body, its general features, and its supportive tissue, the internal components of the kidney including the cortex, medulla, pelvis, and calyces, the vessels and nerves of the kidney, the nephron and its components, the structure of the ureter and urine flow, also understanding how kidney stones form and problems that these structures can cause, and finally a discussion on the structure of the urinary bladder and urethra.

### **Embryology of the Renal and Urinary Systems & Case Study**

**Weeks 11&12: Reproduction: Pelvis & Perineum:** This lecture enumerates the bony landmarks of the pelvis, describes the component parts of the bony pelvis, the divisions of the bony pelvis, the joints and ligaments of the bony pelvis, differentiates between the male and female pelvis, describes the structures that form the walls of the pelvis, discusses the muscles of the pelvis as to their attachments, actions, and nerve supply, the formation and branches of the sacral plexus, the autonomic nerves that supply the pelvis, the arteries of the true pelvis, the venous and lymphatic drainage of the pelvis, the divisions of the perineum, the layers of the perineum, enumerates the structures found within the superficial and deep perineal spaces, the attachments of the Colle's fascia in relation to determining the flow of extravasated urine in patients with a ruptured urethra, the boundaries and contents of the ischioanal fossa, the formation and distribution of the perineal nerve, the location and contents of the pudendal canal, and the blood supply and lymphatic drainage of the perineum.

### **Weeks 11&12: Reproduction: Pelvis & Perineum,** and

**Male Reproduction:** Describe the following structures pertaining to the testes: tunica albuginea, tunica vaginalis, lobules of the testis, seminiferous tubules. Also, this lecture will discuss the functions of the testis, the blood supply, lymphatic drainage and nerve supply of the testis, the anatomical basis of varicocele, the parts of the epididymis, the functions of the epididymis, the blood supply, lymphatic drainage, and nerve supply of the epididymis, the course of the spermatic cord, the coverings of the spermatic cord, the structures that are involved in the cremasteric reflex, discussion on the contents of the spermatic cord, ductus deferens, the parts of the penis, the functions of the penis, the blood supply, lymphatic drainage, and nerve supply of the penis,

the layers of the wall of the scrotum, the blood supply, lymphatic drainage, and nerve supply of the scrotum, the location of the seminal vesicles, the formation of the ejaculatory ducts, the blood supply and nerve supply of the accessory organs of the male reproductive system, the prostate gland with regard to its: anatomical relations, location, and lobes. Finally this lecture will discuss the anatomical basis of urinary obstruction experienced by patients with benign prostatic hypertrophy.

**Week 12: Female Reproduction:** This lecture will describe the ovary with regard to its: location, supports, and function, the appearance of the ovary before puberty and following puberty, the blood supply, lymphatic drainage, and nerve supply of the ovary, the parts of the fallopian (uterine) tube, the functions of the uterine tube, the blood supply, lymphatic drainage, and nerve supply of the uterine tube. Also, this lecture will cover the uterus with regard to its location, parts, and function, the wall and cavity of the uterus, an anteverted and anteflexed uterus, the major and minor supports of the uterus, the blood supply, lymphatic drainage, and nerve supply of the uterus, the anatomical basis of injury to the ureter during surgery on the uterus, the vagina including the vaginal fornices, the functions of the vagina, the blood supply, lymphatic drainage, and nerve supply of the vagina, the clinical significance of the posterior fornix. This lecture will describe the parts of the clitoris, labia majora, labia minora, vestibule, the blood supply, lymphatic drainage, and nerve supply of the external genitalia, and finally the greater and vestibular glands.

### **Embryology of the Reproductive System**

### **Week 13: Pre-Exam Review, Exam, and Post-Exam Review**

### **Week 14 & 15: Final Exams**

#### ***Remember:***

***This is a tentative outline and may be altered for the benefit of the class.***

***The 15 week trimester is divided into 13 weeks of course work followed by 2 weeks of finals.***

#### **Teaching Methodology:**

Lecture: comprised of power point presentations with references to clinical conditions to explain relevance. Clinical cases (either Design-A-Case {DAC} or some other form of case presentation. I-clickers will also be used for formative assessment.

#### **Method of Assessment:**

Students knowledge of the subject matter will be assessed by:

- Multiple choice
- Essay or short answer
- Extended matching questions

The final grade is assessed simply by dividing the total number of correct answers, throughout the course/semester, by the total number of questions during the semester. The professor reserves the right to give as many test and quizzes as is deemed necessary for the students learning. The lab and lecture questions will be tallied together as equal points, the same value, since one is no more important than the other, and are in fact both equally important. **HOWEVER, IT IS IMPORTANT TO NOTE THAT THE FINAL LAB & LECTURE WILL COUNT DOUBLE POINTS.** A percentage of the total correct questions will then be calculated and a grade distributed based on the TCC Grading Scale (see above).

General Lab & Lecture Exam Guidelines:

There is NO talking in exams, or you will be removed from the exam.

All exams & quizzes are the property of Dr. Routh and Dr. Moore and are NOT to be copied or reproduced in any way.

Most exams & quizzes, lecture & lab, will be answered on a Scantron Card. Students are to have a Scantron Card with them at all times in order to be prepared for an unannounced quiz.

If you step on the school seal in the lab, then you will be asked to leave the lab.

Lab attire is either scrubs and/or lab coat and pants with closed toe shoes.

**Grade Method and Scale:** (This is the policy of TCC and must not be altered.) Faculty has the discretion for setting the policy of rounding up or down and should be included in this section.

TCC Grading Scale

A = 90 - 100

B = 80 - 89

C = 70 - 79

F = below 70

POLICY INFORMATION:

**Attendance Policy:** (This is the policy of TCC and must not be altered.)

Regular and punctual attendance of all scheduled classes and laboratories is expected. A student is subject to academic penalty if absences exceed 10%. Absences exceeding 20% subject a student to dismissal from a course. Three incidences of tardiness may constitute an absence. If justifiable cause can be shown for the absenteeism, the student may be permitted to make up missed assignments and maintain enrollment in the class. During the course of their internship, students will be required to be in attendance at the clinic throughout the normal trimester vacation periods unless the clinic is closed. The hours from these periods will be added to the student's clinic requirements.

Also, state the actual attendance policy as it applies to your course. Attendance is based on contact hours and differs from course to course. Therefore, you may want to specifically indicate how many absences will meet the criteria of 10% of absences and 20% of absences.

Three tardies are allowed per semester. After three tardies, you are not allowed to come into class that day, including on quiz and test days.

**Missed Examinations:** (This is the policy of TCC and must not be altered.)

Students must notify faculty before missing any examination. If an examination is missed for good and sufficient reason **and** the student has notified the faculty member in advance, a make-up examination may be given subject to a fee of **\$40.00**. The fee for the make-up examination is a minimum of \$75.00 if a standardized patient is required for the exam. Additional required standardized patient hours may increase this \$75.00 minimum fee. All intra-term examination must be made up prior to final examinations. Missed final examinations must be made up within the first week of the next semester. A student may be allowed a maximum of two missed examination dates for good and sufficient reason per trimester. These two missed examination dates are for all enrolled courses in a trimester, not for each individual course. Any request for additional make-up examinations will require documentation substantiating the absence and must be approved by the Dean of Academic Affairs.

Dr. Routh and Dr. Moore reserve the right to make adjustments to the syllabus at any time.