

Course Title	Anatomy II				
Course Code	MED-206				
Course Type	Required				
Level	Undergraduate				
Year / Semester	Year 2/ Semester 4 (Spring)				
Teacher's Name	Course Lead: Dr Petros Leptos Contributors: Prof Panos Economou Dr Andreas Roushias Dr Christodoulos Yerosimou Dr Savvas Demosthenous				
ECTS	6	Lectures / week	2.5	Laboratories / week	2.5
Course Purpose and Objectives	The main objectives of this course are: <ul style="list-style-type: none"> To help students understand the human body and its constituent tissues and organs as well as their associated function. To help students recognize deviations from normal structure and function with the aim to diagnose abnormal clinical conditions caused by altered anatomy. 				
Learning Outcomes	The body systems to be covered are: Urinary system, Reproductive system, Central and Peripheral Nervous Systems, Musculoskeletal System, Skin and related connective tissue and Sensory organs. The following list provides the learning objectives (LOBs) that will be covered in the lectures and lab practicals of each week (please note that the learning objectives covered during the lectures of a particular week are also covered during the practical of the following week): Week 1 No practical in week 1 LOBs covered during lectures: <ol style="list-style-type: none"> Describe the structure of the auditory system in terms of the tympanic membrane, bones and muscles of the middle ear and cochlea, and outline the neural pathways finally leading to the auditory cortex. Describe the structure and function of the auditory system (outer ear, tympanic membrane, middle ear, inner ear). 				

3. Describe the structure and function of the pharynx and the pharyngotympanic tube.
4. Describe the anatomy of the eye, central visual pathways and major periorbital structures, including the extraocular muscles and their innervation.
5. Describe the different wall layers of the eye.
6. Explain the anatomical basis of the pupillary light and accommodation reflexes.
7. Describe the function of the lens of the eye.
8. Describe embryonic development, fetal maturation, and perinatal changes, including gametogenesis.
9. Describe and identify the major features of the male reproductive organs (scrotum, testis, epididymis).
10. Describe and identify the major constituents of the spermatic cord.
11. Outline the descent of the testes from the posterior abdominal wall, through the inguinal canal, into the scrotum.
12. Describe the clinical significance of the embryological processus vaginalis.
13. Describe and identify the origin, course, embryological significance and relations of the testicular arteries.
14. Describe the clinical significance of the venous drainage of the testis and epididymis in relation to varicocele.
15. Describe the role of cremasteric muscle, dartos muscle and pampiniform plexus of veins in maintaining the optimum temperature for spermatogenesis.
16. Describe the role of cremasteric muscle, dartos muscle and pampiniform plexus of veins in maintaining the optimum temperature for spermatogenesis.
17. Describe and identify the relations of the urinary bladder in males including the overlying peritoneum.
18. Describe and identify the major features of the urethra in males (prostatic, membranous and spongy).
19. Describe the anatomical features that might make urinary catheterisation difficult to perform in males.
20. Describe and identify the major features of the seminal vesicles.
21. Describe and identify the major features of the prostate gland.
22. Describe and identify the relations of the prostate gland (rectum, seminal vesicles, urinary bladder).
23. Compare and contrast the anatomical features of benign prostatic hyperplasia with malignant prostatic neoplasm.
24. Describe and identify the blood supply to and from the prostate gland (prostatic venous plexus).

25. Discuss the clinical significance of the venous drainage from the prostate gland.
26. Identify and describe the location and function of the bulbourethral gland (of Cowper).
27. Describe and identify the major components of the penis (corpora cavernosa, corpus spongiosum, glans penis etc.), their location and function.
28. Describe the process of insemination (erection, emission and ejaculation).
29. Outline the neurological significance of retrograde ejaculation with the significance of internal urethral sphincter.
30. Describe Scarpa and Colle's fascia and their relation with extravasation of urine.
31. Describe and identify the boundaries and relations of the inguinal canal in males.
32. Define and identify the differential contents of the inguinal canal in males.
33. Differentiate between direct and indirect inguinal hernias.

Week 2

LOBs covered during practical:

1. Describe the structure of the auditory system in terms of the tympanic membrane, bones and muscles of the middle ear and cochlea, and outline the neural pathways finally leading to the auditory cortex.
2. Describe the structure and function of the auditory system (outer ear, tympanic membrane, middle ear, inner ear).
3. Describe the structure and function of the pharynx and the pharyngotympanic tube.
4. Describe the anatomy of the eye, central visual pathways and major periorbital structures, including the extraocular muscles and their innervation.
5. Describe the different wall layers of the eye.
6. Explain the anatomical basis of the pupillary light and accommodation reflexes.
7. Describe the function of the lens of the eye.

LOBs covered during lectures:

34. Describe the anatomy of the breast.
35. Describe the blood supply and lymphatic drainage of the breast.
36. Describe the brachial plexus and identify its major terminal branches.

37. Identify breast normal and pathological structures in radiological images.
38. Describe, in general terms, the relationship between the pelvic peritoneum and the female pelvic organs.
39. Describe and identify the major features of the internal female reproductive organs (ovaries, uterine tubes, uterus, cervix, endocervix and vagina).
40. Describe and identify the relations of female reproductive organs with rectum, bladder and urethra.
41. Describe and identify the innervation of the ovaries, uterine tubes, uterus, cervix, vagina and vulva.
42. Describe the clinical significance of the blood supply, innervation and lymphatic drainage from the ovaries, uterine tubes, uterus, cervix, vagina and vulva.
43. Describe and identify the origin, course and relations of the uterine and ovarian arteries.
44. Identify the relationship of uterine artery and ureter and the importance of this relation in hysterectomy.
45. Describe, in general terms, the major supports for the uterus.
46. Describe and identify the features of uterine fibroids.
47. Describe, in general terms, the autonomic innervation of the urinary bladder, in micturition and maintenance of continence.
48. Describe the anatomy of clitoris.
49. Describe the anatomy of the urethra in relationship to continence and catheterisation.
50. Describe and identify the major features of the external genitalia (vulva) in females, its lymphatic drainage and sites of episiotomies.
51. Describe the origin, course and main branches of the pudendal nerves and the sites of nerve block during childbirth.
52. Describe the mechanism of erection of cavernous tissue in the female.

Week 3

No practical in week 3

LOBs covered during lectures:

53. Describe the anatomy of bones of the skull, the cranial cavity, the meninges and the dural reflections.
54. Describe the anatomy of the cerebral ventricles and the circulation of the CSF.
55. Describe the anatomical basis of lumbar puncture.
56. Outline the anterior circulation to the brain.

57. Outline the posterior circulation to the brain.
58. Outline the venous drainage of the brain, including the concept of the dural venous sinuses and the important anatomical relationships of the cavernous sinus.

Week 4

LOBs covered during practical:

8. Describe embryonic development, fetal maturation, and perinatal changes, including gametogenesis.
9. Describe and identify the major features of the male reproductive organs (scrotum, testis, epididymis).
10. Describe and identify the major constituents of the spermatic cord.
11. Outline the descent of the testes from the posterior abdominal wall, through the inguinal canal, into the scrotum.
12. Describe the clinical significance of the embryological processus vaginalis.
13. Describe and identify the origin, course, embryological significance and relations of the testicular arteries.
14. Describe the clinical significance of the venous drainage of the testis and epididymis in relation to varicocele.
15. Describe the role of cremasteric muscle, dartos muscle and pampiniform plexus of veins in maintaining the optimum temperature for spermatogenesis.
16. Describe the role of cremasteric muscle, dartos muscle and pampiniform plexus of veins in maintaining the optimum temperature for spermatogenesis.
17. Describe and identify the relations of the urinary bladder in males including the overlying peritoneum.
18. Describe and identify the major features of the urethra in males (prostatic, membranous and spongy).
19. Describe the anatomical features that might make urinary catheterisation difficult to perform in males.
20. Describe and identify the major features of the seminal vesicles.
21. Describe and identify the major features of the prostate gland.
22. Describe and identify the relations of the prostate gland (rectum, seminal vesicles, urinary bladder).
23. Compare and contrast the anatomical features of benign prostatic hyperplasia with malignant prostatic neoplasm.
24. Describe and identify the blood supply to and from the prostate gland (prostatic venous plexus).
25. Discuss the clinical significance of the venous drainage from the prostate gland.

26. Identify and describe the location and function of the bulbourethral gland (of Cowper).
27. Describe and identify the major components of the penis (corpora cavernosa, corpus spongiosum, glans penis etc.), their location and function.
28. Describe the process of insemination (erection, emission and ejaculation).
29. Outline the neurological significance of retrograde ejaculation with the significance of internal urethral sphincter.
30. Describe Scarpa and Colle's fascia and their relation with extravasation of urine.
31. Describe and identify the boundaries and relations of the inguinal canal in males.
32. Define and identify the differential contents of the inguinal canal in males.
33. Differentiate between direct and indirect inguinal hernias.
34. Describe the anatomy of the breast.
35. Describe the blood supply and lymphatic drainage of the breast.
36. Describe the brachial plexus and identify its major terminal branches.
37. Identify breast normal and pathological structures in radiological images.
38. Describe, in general terms, the relationship between the pelvic peritoneum and the female pelvic organs.
39. Describe and identify the major features of the internal female reproductive organs (ovaries, uterine tubes, uterus, cervix, endocervix and vagina).
40. Describe and identify the relations of female reproductive organs with rectum, bladder and urethra.
41. Describe and identify the innervation of the ovaries, uterine tubes, uterus, cervix, vagina and vulva.
42. Describe the clinical significance of the blood supply, innervation and lymphatic drainage from the ovaries, uterine tubes, uterus, cervix, vagina and vulva.
43. Describe and identify the origin, course and relations of the uterine and ovarian arteries.
44. Identify the relationship of uterine artery and ureter and the importance of this relation in hysterectomy.
45. Describe, in general terms, the major supports for the uterus.
46. Describe and identify the features of uterine fibroids.
47. Describe, in general terms, the autonomic innervation of the urinary bladder, in micturition and maintenance of continence.
48. Describe the anatomy of clitoris.

49. Describe the anatomy of the urethra in relationship to continence and catheterisation.
50. Describe and identify the major features of the external genitalia (vulva) in females, its lymphatic drainage and sites of episiotomies.
51. Describe the origin, course and main branches of the pudendal nerves and the sites of nerve block during childbirth.
52. Describe the mechanism of erection of cavernous tissue in the female.

LOBs covered during lectures:

59. Describe major divisions of the CNS.
60. Locate cranial nerves and the structures supplied by each nerve.
61. Describe anatomy of the brain stem and cerebellum.
62. Describe the functional divisions of the cerebellum, its connections with the brain stem
63. Describe the anatomy, relations and functions of cranial nerves.

Week 5

LOBs covered during practical:

53. Describe the anatomy of bones of the skull, the cranial cavity, the meninges and the dural reflections.
54. Describe the anatomy of the cerebral ventricles and the circulation of the CSF.
55. Describe the anatomical basis of lumbar puncture.
56. Outline the anterior circulation to the brain.
57. Outline the posterior circulation to the brain.
58. Outline the venous drainage of the brain, including the concept of the dural venous sinuses and the important anatomical relationships of the cavernous sinus.
59. Describe major divisions of the CNS.
60. Locate cranial nerves and the structures supplied by each nerve.
61. Describe anatomy of the brain stem and cerebellum.
62. Describe the functional divisions of the cerebellum, its connections with the brain stem.
63. Describe the anatomy, relations and functions of cranial nerves.

LOBs covered during lectures:

64. Describe the anatomy of the spinal cord and its surrounding structures.

65. Differentiate the arrangement of grey and white matter in the spinal cord and the location of the most clinically-important white matter pathways.
66. Describe the anatomy of the corticospinal and corticobulbar tracts (somatic motor).
67. Describe the spinothalamic and dorsal column pathways (somatic sensory).
68. Describe the anatomy of the craniosacral (parasympathetic) and thoracolumbar (sympathetic) outflows of the spinal cord and the sympathetic chain ganglia.
69. Describe what is meant by 'upper motor neurone' (UMN) and 'lower motor neurone' (LMN).
70. Outline the anatomy and function of components of the CNS related to sensation in all its modalities: Spinal Cord, Brain Stem, Cortex
71. Explain how and why sensory pathways are topographically organised, and why the resulting 'maps' may have a distorted scale.
72. Revise the divisions, structures and major outflow tracks of the autonomic nervous system.

Week 6

FORMATIVE MIDTERM EXAM

LOBs covered during practical:

64. Describe the anatomy of the spinal cord and its surrounding structures.
65. Differentiate the arrangement of grey and white matter in the spinal cord and the location of the most clinically-important white matter pathways.
66. Describe the anatomy of the corticospinal and corticobulbar tracts (somatic motor).
67. Describe the spinothalamic and dorsal column pathways (somatic sensory).
68. Describe the anatomy of the craniosacral (parasympathetic) and thoracolumbar (sympathetic) outflows of the spinal cord and the sympathetic chain ganglia.
69. Describe what is meant by 'upper motor neurone' (UMN) and 'lower motor neurone' (LMN).
70. Outline the anatomy and function of components of the CNS related to sensation in all its modalities: Spinal Cord, Brain Stem, Cortex.
71. Explain how and why sensory pathways are topographically organised, and why the resulting 'maps' may have a distorted scale.

72. Revise the divisions, structures and major outflow tracks of the autonomic nervous system.

LOBs covered during lectures:

73. Identify the main parts of the basal ganglia and internal capsule and their three-dimensional arrangement around the lateral ventricle.

74. Identify the thalamus, hypothalamus and pineal gland and their relations to the third ventricle.

75. Describe the three-dimensional shape of corpus stratum and how it relates to the ventricular system and internal capsule.

76. Identify the main components of limbic lobe, including the hippocampus, fornix and amygdala.

77. Review the blood supply to the deep grey matter structures of the brain.

Week 7

LOBs covered during practical:

73. Identify the main parts of the basal ganglia and internal capsule and their three-dimensional arrangement around the lateral ventricle.

74. Identify the thalamus, hypothalamus and pineal gland and their relations to the third ventricle.

75. Describe the three-dimensional shape of corpus stratum and how it relates to the ventricular system and internal capsule.

76. Identify the main components of limbic lobe, including the hippocampus, fornix and amygdala.

77. Review the blood supply to the deep grey matter structures of the brain.

LOBs covered during lectures:

78. Describe the general function of the skeleton and joints.

79. Describe the structure and properties of different types of cartilage.

80. Describe the structure and movements of the knee and hip joints, including the organisation and functions of the ligaments.

81. Demonstrate an overview of the key functions and structures of the musculoskeletal system.

82. Outline the structure and function (stability and mobility) of the hip joint and its bony components.

83. Describe the static support of hip joints (ligaments and joint capsule).

84. Outline the musculature and Fascia of the hip and thigh.

85. Describe the muscles moving the hip joint.
86. Outline the blood supply (vasculature) to the hip joint and femoral head.
87. Describe the innervation of the hip joint and the musculature involved in moving the hip.

Week 8

LOBs covered during practical:

78. Describe the general function of the skeleton and joints.
79. Describe the structure and properties of different types of cartilage.
80. Describe the structure and movements of the knee and hip joints, including the organisation and functions of the ligaments.
81. Demonstrate an overview of the key functions and structures of the musculoskeletal system.
82. Outline the structure and function (stability and mobility) of the hip joint and its bony components.
83. Describe the static support of hip joints (ligaments and joint capsule).
84. Outline the musculature and Fascia of the hip and thigh.
85. Describe the muscles moving the hip joint.
86. Outline the blood supply (vasculature) to the hip joint and femoral head.
87. Describe the innervation of the hip joint and the musculature involved in moving the hip.

LOBs covered during lectures:

88. Describe the bony components of the leg, knee and ankle joints.
89. Outline the static support of the knee and ankle joints (ligaments and joint capsule).
90. Describe the articular cartilage and menisci of the knee.
91. Describe the musculature, fascia and cartilage of the knee and ankle.
92. Describe the muscles moving the knee joint.
93. Describe the muscles moving the ankle joint.
94. Describe the muscles of the foot.
95. Describe the innervation of knee joint and the musculature involved in moving the knee.
96. Describe the innervation of knee joint and the musculature involved in moving the ankle.

Week 9

LOBs covered during practical:

88. Describe the bony components of the leg, knee and ankle joints.
89. Outline the static support of the knee and ankle joints (ligaments and joint capsule).
90. Describe the articular cartilage and menisci of the knee.
91. Describe the musculature, fascia and cartilage of the knee and ankle.
92. Describe the muscles moving the knee joint.
93. Describe the muscles moving the ankle joint.
94. Describe the muscles of the foot.
95. Describe the innervation of knee joint and the musculature involved in moving the knee.
96. Describe the innervation of knee joint and the musculature involved in moving the ankle.

LOBs covered during lectures:

97. Describe the bony components of the shoulder and upper limb.
98. Describe the structure and function (stability and mobility) of the glenohumeral joint and its bony components.
99. Describe the structure and function (stability and mobility) of the elbow joint and its bony components.
100. Describe the components and movements of the pectoral girdle.
101. Explain the static supports (joint capsules, ligaments) of the shoulder and elbow joints.
102. Describe the musculature and fascia of the shoulder and elbow.
103. Describe the muscles involved in moving the shoulder joint.
104. Describe the muscles involved in moving the elbow joint.
105. Outline the blood supply (vasculature) to the shoulder joint.
106. Describe the blood supply to the upper limb.
107. Describe the innervation to the shoulder and elbow joints.
108. Describe the brachial plexus and its terminal branches.

Week 10

LOBs covered during practical:

97. Describe the bony components of the shoulder and upper limb.
98. Describe the structure and function (stability and mobility) of the glenohumeral joint and its bony components.

99. Describe the structure and function (stability and mobility) of the elbow joint and its bony components.
100. Describe the components and movements of the pectoral girdle.
101. Explain the static supports (joint capsules, ligaments) of the shoulder and elbow joints.
102. Describe the musculature and fascia of the shoulder and elbow.
103. Describe the muscles involved in moving the shoulder joint.
104. Describe the muscles involved in moving the elbow joint.
105. Outline the blood supply (vasculature) to the shoulder joint.
106. Describe the blood supply to the upper limb.
107. Describe the innervation to the shoulder and elbow joints.
108. Describe the brachial plexus and its terminal branches.

LOBs covered during lectures:

109. Describe the bony components of forearm, wrist and hand.
110. Describe Carpal Tunnel.
111. Outline the musculature and fascia of the forearm, wrist and hand.
112. Describe the muscles and associated compartments of the forearm.
113. Outline the boundaries of 'anatomical snuffbox.'
114. Describe the groups of intrinsic muscles of the hand.
115. Describe the blood supply (vasculature) to and drainage from the forearm and the hand.
116. Explain the clinical significance of the blood supply to hand.
117. Describe the innervation of the forearm compartments.
118. Describe the innervation to the hand.
119. Describe the anatomy of the vertebral column.
120. Identify the different types of vertebra.
121. Identify the facets of vertebra and types of joints between them.
122. Describe the anatomy of the ribs.
123. Describe true ribs, false ribs, manubrium, body and xiphoid process of the sternum, clavicle scapula, muscles of the thoracic wall, boundaries and contents of the axilla.
124. Recognise the differences between the rib cage in the adult and child.
125. Describe the intrinsic and extrinsic muscles of breathing.
126. Identify the different layers of the abdominal wall.
127. Identify the muscles of the abdominal wall.

128. Describe the layers of the rectus sheath.
129. Describe the different muscles of the anterior and posterior thorax and their movements.
130. Describe what a rotator cuff injury is.
131. Describe the muscles of the back and their actions.
132. Identify the facial muscles and their innervation.
133. Describe the clinical presentation of facial nerve palsy.
134. Describe the bones that form the skull.
135. Describe the foramina of the skull and the structures that enter or exit the Cravial cavity.

Week 11

LOBs covered during practical:

109. Describe the bony components of forearm, wrist and hand.
110. Describe Carpal Tunnel.
111. Outline the musculature and fascia of the forearm, wrist and hand.
112. Describe the muscles and associated compartments of the forearm.
113. Outline the boundaries of 'anatomical snuffbox.'
114. Describe the groups of intrinsic muscles of the hand.
115. Describe the blood supply (vasculature) to and drainage from the forearm and the hand.
116. Explain the clinical significance of the blood supply to hand.
117. Describe the innervation of the forearm compartments.
118. Describe the innervation to the hand.
119. Describe the anatomy of the vertebral column.
120. Identify the different types of vertebra.
121. Identify the facets of vertebra and types of joints between them.
122. Describe the anatomy of the ribs.
123. Describe true ribs, false ribs, manubrium, body and xiphoid process of the sternum, clavicle scapula, muscles of the thoracic wall, boundaries and contents of the axilla.
124. Recognise the differences between the rib cage in the adult and child.
125. Describe the intrinsic and extrinsic muscles of breathing.
126. Identify the different layers of the abdominal wall.
127. Identify the muscles of the abdominal wall.
128. Describe the layers of the rectus sheath.

	<p>129. Describe the different muscles of the anterior and posterior thorax and their movements.</p> <p>130. Describe what a rotator cuff injury is.</p> <p>131. Describe the muscles of the back and their actions.</p> <p>132. Identify the facial muscles and their innervation.</p> <p>133. Describe the clinical presentation of facial nerve palsy.</p> <p>134. Describe the bones that form the skull.</p> <p>135. Describe the foramina of the skull and the structures that enter or exit the Cravial cavity.</p> <p><i>LOBs covered during lectures:</i></p> <p>136. Describe the anatomy of the skin.</p> <p>137. Describe the different layers of the skin.</p> <p>138. Describe the skin appendices and their function.</p> <p>139. Describe the anatomy of the hair follicles.</p> <p>140. Describe the anatomy of the nails and the nail bed.</p> <p>141. Describe the blood supply of the skin.</p> <p>142. Describe the meaning of the dermatome and identify major spinal levels for dermatome innervation.</p> <p>Week 12</p> <p><i>LOBs covered during practical:</i></p> <p>136. Describe the anatomy of the skin.</p> <p>137. Describe the different layers of the skin.</p> <p>138. Describe the skin appendices and their function.</p> <p>139. Describe the anatomy of the hair follicles.</p> <p>140. Describe the anatomy of the nails and the nail bed.</p> <p>141. Describe the blood supply of the skin.</p> <p>142. Describe the meaning of the dermatome and identify major spinal levels for dermatome innervation.</p> <p><i>LOBs covered during lectures: Revision.</i></p>		
Prerequisites	None	Required	None
Course Content	<p><u>Topics covered in lectures:</u></p> <ul style="list-style-type: none"> • SENSORY ORGANS: Anatomy of the ear, anatomy of the eye. • REPRODUCTIVE SYSTEM I: Male reproductive system. 		

	Moore, Keith L.	Clinically oriented anatomy	8 th Int'l Edition	Lippincott Williams & Wilkins	2017	9781496354044
	Recommended Textbooks/Reading:					
	Authors	Title	Edition	Publisher	Year	ISBN
	Dudek, Ronald W.	High yield: gross anatomy	5 th Edition	Lippincott Williams & Wilkins	2014	9781451190236
	Chung, K.W. , Chung, H. & Halliday, N.L.	BRS Gross Anatomy	8 th Edition	Lippincott Williams & Wilkins	2014	9781451193077
Assessment	For course MED-206 Anatomy II there will be an online Formative Midterm Exam. The grade for the course will be contributed by the Anatomy Practical Exam (15%) and a Summative Final Exam (85%). Written exams consist of Single Best Answer MCQs (SBAs) and Short Answer Questions (SAQs).					
Language	English					