Course Code	Course Title	ECTS Credits
MED-207	Histology II	6
School	**Semester**	**Prerequisites**
Medical School	Spring (Semester 4)	Completion of Year 1
Type of Course	**Field**	**Language of Instruction**
Required	Medicine	English
Level of Course	**Year of Study**	**Course Lead:**
Undergraduate	2nd	Dr Despina Moissidou **Contributors:** Dr Petros Leptos Dr Spyros Papacharalambous
Mode of Delivery	**Work Placement**	**Co-requisites**
Face-to-face	N/A	None

Objectives of the Course:

The main objectives of this course are:

- To acquire a basic background in histology, to understand the properties of cells and their interactions with one another, as components of tissues and organs.
- To understand how structure and function correlate at the microscopic level.
- To be able to describe the normal structure and function of various cell types, tissues, and organs, and to differentiate their histological structures from each other through examination.
- To acquire a basic background on the fetal development of the various organ systems.
- To understand how embryonic structures differentiate into different organs.
- To acquire basic knowledge on the birth defects in various systems.

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 that will be covered in the lectures , lab practicals and tutorials of each week:

Week 1

LOBs covered during lectures:

1. Identify the different histological structures of the kidney and describe their function.
2. Describe the histophysiological features of the kidney structures.
3. Describe the histological features of the ureter, urinary bladder and urethra.
4. Outline the developmental stages of the urinary system.
5. Outline the development of the collecting and the excretory systems.
6. Outline the embryonic development of the bladder and the urethra.
7. Describe the clinical correlations of the urinary system development: renal dysplasias and agenesis, abnormal location of the kidneys, bladder defects.
8. Outline the characteristics of autosomal recessive polycystic kidney disease and Wilms tumour.

LOBs covered during practical:

9. Distinguish the different regions of the nephron based on their histological features.

Week 2

LOBs covered during lectures:

10. Describe the histological features of the testes and their ductal system.
11. Outline and briefly explain the different stages of spermatogenesis.
12. Describe the histological features of the prostate gland and penis.
13. Describe the embryonic development of the male reproductive system.
14. Outline the development of the testis and the genital duct.
15. Describe the clinical correlations with the development of the external genitalia
16. Outline anomalies of sexual development

LOB covered during practical:

17. Distinguish spermatogenic, sertoli and Leydig cells and describe their main histological features.

Week 3

LOBs covered during lectures:

18. Describe the major histological features, repair and renewal of the skeletal muscle tissue.
19. Describe the major histological features, repair and renewal of the cardiac muscle tissue.
20. Describe the major histological features, repair and renewal of the smooth muscle tissue.

LOB covered during practical:

21. Identify microscopically the differences between the three types of muscle tissue.

Week 4

LOBs covered during lectures:

22. Outline and briefly explain the different stages of oogenesis.
23. Describe the histophysiological features of the ovaries and the uterine tubes.
24. Describe the histophysiological features of the uterus and vagina.
25. Describe the histological features of the mammary glands.
26. Describe the embryonic development of the female reproductive system.
27. Outline the formation of the ovaries and the vagina.
28. Describe the clinical correlations of the female reproductive system.
29. Outline the uterine anomalies as birth defects.

LOB covered during practical:

30. Distinguish the different types of ovarian follicles by routine histology.
31. Identify the histological features of the uterus and vagina.

Week 5

LOBs covered during lectures:

32. Describe the morphological characteristics and function of neurons.
33. Describe the histological morphology and function of the supporting cells of the nerve tissue.
34. Outline the stages of the eye and ear development.
35. Describe the development of the internal, middle and external ear.

36. Describe the development of the eye and the optic nerve.
37. Outline the congenital malformations of the eye.
38. Outline the congenital malformations of the ear and hearing loss.

LOB covered during lab practical:

39. Identify microscopically the differences between neurons and supporting cells.

Week 6

LOBs covered during lectures:

40. Describe the morphologic organization of the central nervous system.
41. Describe the morphologic organization of the autonomic nervous system.
42. Describe the morphologic organization of the peripheral nervous system.
43. Briefly describe the development of the spinal cord.
44. Outline the stages of the brain development.
45. Outline the stages of the cranial nerve development.
46. Outline the congenital malformations of the neural tube.
47. Describe the congenital malformations of the central nervous system.

LOB covered during lab practical:

48. Outline the different layers of a nerve in the Peripheral Nervous System.
49. Outline the different layers of the Central Nervous System.

Week 7

MIDTERM EXAM

Week 8

LOBs covered during lectures:

50. Outline the composition of the bone matrix.
51. Describe the function of the cells making up the bone.
52. Describe the different mechanisms of bone formation.
53. Outline the embryonic development of the various types of muscular tissue.
54. Outline the development of skeletal musculature
55. Outline the developmental stages of the axial skeleton (skull, vertebral column, ribs and sternum)
56. Describe the limb growth and development.
57. Describe the clinical correlations of the musculoskeletal development: Poland sequence, muscular dystrophy, prune belly syndrome, meromelia, amelia, brachydaktyly, cleft hand and foot, Holt-Oram syndrome, osteogenesis imperfecta and Marfan syndrome.
58. Outline the craniofacial defects and skeletal dysplasias: cranioschisis, craniosynostosis, achondroplasia, hypochondroplasia, cleiocranial dysostosis and rib defects.

LOB covered during lab practical:

59. Outline the different morphological characteristics of compact versus spongy bone.

Week 9

LOBs covered during lectures:

60. Describe the histological features of skin, nail and hair.
61. Outline the different types of cells found in the skin and describe their function.
62. Describe the structure of the skin.

63. Outline the development of the hair, skin and nail.
64. Outline the development of sweat and mammary glands.
65. Describe the clinical correlations of skin pigmentation and keratinisation.
66. Outline the abnormalities of hair distribution.

LOB covered during lab practical:

67. Identify histologically the different layers of the skin, and its components.

Week 10

LOBs covered during lectures:

68. Describe the microscopic features of the eye.
69. Describe the microscopic features of the ear.
70. Outline the developmental stages of the head and the neck.
71. Outline the development of the structures derived from pharyngeal pouches.
72. Describe the facial development, nasal cavities and teeth.
73. Describe the clinical correlations of the facial development and neck development: branchial fistulas, Treacher-Collins syndrome, Robin sequence, 22q11.2 deletion syndrome, facial clefts, Van der Woude syndrome and cleft palate.
74. Outline the clinical consideration in the development of thymus, thyroid, and parathyroid tissue: ectopic thymic and parathyroid tissue, thyroglossal ducts and thyroid abnormalities.

LOB covered during lab practical:

75. Identify microscopically the different layers of the eye cornea.
76. Identify microscopically features of the internal ear.

Week 11

Embryology Review

Week 12

Histology Review.

Course Contents:

Topics covered in lectures

- Histology of the Urinary System.
- Embryology of the Urinary System.
- Histology of the Male Reproductive System.
- Embryology of the Male Reproductive System.
- Histology of the Female Reproductive System.
- Embryology of the Female Reproductive System.
- Histology of the Nervous System- Nervous Tissue- Neurons and Supporting cells.
- Embryology of the Nervous System.
- Histology of the Nervous System- Organization of Central, Peripheral and Autonomic Nervous System.
- Embryology of the Nervous System
- Histology of the Musculoskeletal System
- Embryology of the Musculoskeletal Tissue.
- Histology of the Integumentary System.

- Embryology of the Integumentary System.
- Histology of Eye and Ear.
- Embryology of the Eye and Ear.

Topics covered in practicals:

- Histology of the Urinary System.
- Histology of the Male Reproductive System.
- Histology of the Female Reproductive System.
- Histology of the Nervous System.
- Histology of the Musculoskeletal System I (Muscular tissue).
- Histology of the Musculoskeletal System II (Bone).
- Histology of the Integumentary System.
- Histology of the Eye and Ear.

Topics covered in tutorial:

- USMLE Practice Questions.

Learning Activities and Teaching Methods:

Lectures, Tutorials, Laboratory Practical Sessions.

Assessment Methods:

Laboratory reports (10%), Midterm Exam (30%), and Final Exam (60%). Assessment is by Single Best Answers (SBAs) and Short Answer Questions (SAQs).

Required Textbooks/Reading:

Authors	Title	Edition	Publisher	Year	ISBN
Wojciech Pawlina, Michael H. Ross	Histology: A Text and Atlas with correlated cell and molecular biology	7th Edition	Wolters Kluwer/ Lippincott Williams & Wilkins	2015 INT'L Ed	9781469889313
Kierszenbaum Abraham	Histology and Cell Biology: An introduction to Pathology	4th Edition new	Elsevier/Sanders	2015	978-0323313308

Recommended Textbooks/Reading:

Authors	Title	Edition	Publisher	Year	ISBN
Young, Barbara	Wheater's functional histology: a text and colour atlas	6th Edition	Churchill Livingstone/Elsevier	2013	9780702047473

Sadler, Thomas	Langman's Medical Embryology	12th Edition	Wolters Kluwer/ Lippincott Williams & Wilkins	2016	978-1451113426