

**COURSE DATA****Data Subject**

|                      |                                  |
|----------------------|----------------------------------|
| <b>Code</b>          | 34441                            |
| <b>Name</b>          | Anatomy of apparatus and systems |
| <b>Cycle</b>         | Grade                            |
| <b>ECTS Credits</b>  | 6.0                              |
| <b>Academic year</b> | 2021 - 2022                      |

**Study (s)**

| <b>Degree</b>             | <b>Center</b>                      | <b>Acad. year</b> | <b>Period</b> |
|---------------------------|------------------------------------|-------------------|---------------|
| 1204 - Degree in Medicine | Faculty of Medicine and Odontology | 1                 | Second term   |

**Subject-matter**

| <b>Degree</b>             | <b>Subject-matter</b> | <b>Character</b> |
|---------------------------|-----------------------|------------------|
| 1204 - Degree in Medicine | 1 - Human anatomy     | Basic Training   |

**Coordination**

| <b>Name</b>             | <b>Department</b>                 |
|-------------------------|-----------------------------------|
| GIMENO MONROS, AMPARO   | 17 - Human Anatomy and Embryology |
| SANCHEZ ZURIAGA, DANIEL | 17 - Human Anatomy and Embryology |
| ZARAGOZA COLOM, ROSA    | 17 - Human Anatomy and Embryology |

**SUMMARY**

The study of Anatomy of Apparatus and Systems is fundamental in the training of a doctor, for it explains the different apparatus and systems of the human being in state of health or normality, why they are like this and what their function is.

It is the fundamental basis to address the study of other subjects in the first course (Physiology, Histology...) as well as Medical subjects (Digestive, Cardio-circulatory, Endocrine...) and Surgical ones, where the anatomical knowledge is essential (Digestive, cardiac, vascular surgery...).

Regarding the medical practice the anatomy provides the essential bases for any medical act from the exploration to the diagnoses. Currently, this is seen maximized when studying the anatomy with the new diagnoses techniques due to the image of the human shape that the study allows increasingly more precise and more real.



## PREVIOUS KNOWLEDGE

### Relationship to other subjects of the same degree

There are no specified enrollment restrictions with other subjects of the curriculum.

### Other requirements

## OUTCOMES

### 1204 - Degree in Medicine

- Understand and recognise the structure and normal function of the human body, at the following levels: molecular, tissue, organic, and of systems, in each phase of human life and in both sexes.
- Understand and recognise the effects of growth, development and aging which affect individuals and their social environment.
- Know how to use the sources of clinical and biomedical information available, and value them critically in order to obtain, organise, interpret and communicate scientific and sanitary information.
- Know how to use IT in clinical, therapeutic and preventive activities, and those of research.
- Be able to formulate hypothesis, gather information and evaluate it critically in order to solve problems by following the scientific method.
- Establish a good interpersonal communication which may allow professionals show empathy and talk to the patients efficiently, as well as to their relatives, the media and other professionals.
- Proper organisation and planning of the workload and timing in professional activities.
- Team-working skills and engaging with other people in the same line of work or different.
- Criticism and self-criticism skills.
- Capacity for communicating with professional circles from other domains.
- Acknowledge diversity and multiculturality.
- Consideration of ethics as a fundamental value in the professional practise.
- Working capacity to function in an international context.
- Knows the morphology, structure and function of skin, blood, organs and body systems: circulatory, digestive, locomotor, reproductive, excretory and respiratory systems; endocrine system, immune system, central and peripheral nervous systems.
- Knows the processes of growth, maturation and aging of the different organs and systems. Homeostasis. Adaptation to the environment.
- Recognises the morphology and structure of tissue, organs and systems through macroscopic and microscopic methods, and image techniques.



## LEARNING OUTCOMES

1. Knowledge of the topographical, structural and functional organization of the apparatus and systems and their clinical applicability.
2. To know the spatial distribution of the apparatus and systems with the proper anatomical references.
3. To know and to apply the terminology of the subject
4. Acquisition of skills in the recognition of anatomical structures and their disposition.
5. To know the basic principles of the work, instrumental utility and protocol security in the practice of human dissection.

## DESCRIPTION OF CONTENTS

### 1. HEAD AND NECK

- 1.- Oral cavity. Stomatognathic system.
- 2.- Salivary glands.
- 3.- Cephalic autonomic nervous system.
- 4.- Tongue. Neuromuscular system of the hypoglossal nerve. Hyoid bone.
- 5.- Larynx (I). Cartilages, joints and neuromuscular system of the laryngeal nerves.
- 6.- Larynx (II). Internal configuration. Laryngeal spaces. Vascularization and innervation. Thyroid gland. Parathyroid glands. External configuration. Situation. Relations. Vascularization. Innervation.
- 7.- Pharynx. External configuration. Situation. Relations. Pharyngeal muscles. Vascularization and innervation. Maxillo-pharyngeal spaces.

### 2. THORAX

- 8.- Organization of the mediastinum. Mammary gland. Thymus.
- 9.- Heart (I). External configuration: situation. Fixation systems. Relations. Pericardium. Pericardial sinuses.
- 10.- Heart (II). Internal configuration: myocardium and endocardium. Heart chambers. Valves.
- 11.- Heart (III). Heart vascularization. Coronary arteries and veins. Vascular areas. Heart innervation. Cardiac plexus. Heart conduction system.
- 12.- Posterior mediastinum. Thoracic aorta. Azygos and hemiazygos veins. Thoracic duct. Oesophagus. Splanchnic nerves. Situation. Relations.
- 13.- Lungs (I). Trachea and main bronchi. Situation. Relations. Vascularization. Innervation.
- 14.- Lungs (II). External configuration. Situation. Relations. Vascularization. Innervation. Pleurae.



### 3. ABDOMEN

- 15.- Retroperitoneal vascular axis. Abdominal aorta and its branches. Inferior vena cava and its branches. Cisterna chyli or cistern of Pecquet. Solar plexus.
- 16.- Coeliac viscera (I). Liver and biliary tree.
- 17.- Coeliac viscera (II). Stomach.
- 18.- Coeliac viscera (III). Duodenum. Pancreas. Spleen.
- 19.- Intraperitoneal viscera. Jejunum and ileum. Colon.
- 20.- Retroperitoneal viscera (I). Kidney.
- 21.- Retroperitoneal viscera (II). Ureter and adrenal gland.
- 22.- Abdominal regions. Peritoneum. Peritoneal spaces.

### 4. PELVIS

- 23.- Pelvic cavity. Pelvic floor muscles. Perineal muscles.
- 24.- Pelvic viscera common to both genders (I). Bladder and urethra.
- 25.- Pelvic viscera common to both genders (II). Rectum, anal canal.
- 26.- Female genital system (I). Ovary. Fallopian tubes and uterus.
- 27.- Female genital system (II). Vagina and external genitalia.
- 28.- Male genital system(I). Testicles. Seminal pathway. Vas deferens. Seminal vesicles.
- 29.- Male genital system (II). Prostate. External genitalia: penis.
- 30.- Pelvic angiology. Internal iliac arteries and veins. Branches. Pelvic innervation. Pelvic autonomic innervation. Hypogastric plexus. Pelvic topographic spaces.

### 5. LABORATORY PRACTICES. DISSECTION ROOM.

- PRACTICAL SESSION 1: Cephalic autonomic nervous system.
- PRACTICAL SESSION 2: Dissection of the viscera of the head and neck: salivary glands, thyroid gland, larynx. Study of the skeleton and laryngeal muscles in models.
- PRACTICAL SESSION 3: Dissection of the thoracic viscera (I). Observation of the viscera in situ. Pericardium and pericardial sinuses. External cardiac morphology: surfaces and borders of the heart.
- PRACTICAL SESSION 4: Dissection of the thoracic viscera (II). Heart: heart chambers. Vascularization of the heart: coronary circulation and cardiac veins.
- PRACTICAL SESSION 5: Dissection of the thoracic viscera (III). Lungs and posterior mediastinum.
- PRACTICAL SESSION 6: Dissection of the abdominal viscera (I). Liver and coeliac viscera.
- PRACTICAL SESSION 7: Dissection of the abdominal viscera (II). Small intestine and colon. Abdominal aorta, inferior vena cava and its main branches. Retroperitoneal viscera: kidney and ureter.
- PRACTICAL SESSION 8: Dissection of the pelvic viscera. Models and sagittal sections of anatomical preparations of the male and female pelvis. Internal iliac artery and its main branches.
- PRACTICAL SESSION 9: Dissection of external genitalia. Male external genitalia: penis, scrotum, spermatic cord. Female external genitalia: labia majora, labia minora, mons pubis. Study in corpse and models.



**6. COMPUTER PRACTICES.**

- 1.- Radiology of head and neck. Thoracic radiology (RX,TAC,RM)
- 2.- Abdominal-pelvic radiology (RX, TAC,RM)

**7. TUTORED GROUPS.**

A group of students, with the tutorage of the teacher, attend a dissection sessions and carry out an assignment about it, which they present to their classmates during the practical sessions in the Dissection Room.

**WORKLOAD**

| ACTIVITY                                     | Hours         | % To be attended |
|--|---------------|------------------|
| Theory classes                               | 33,00         | 100              |
| Laboratory practices                         | 19,00         | 100              |
| Computer classroom practice                  | 4,00          | 100              |
| Tutorials                                    | 4,00          | 100              |
| Development of individual work               | 5,00          | 0                |
| Study and independent work                   | 30,00         | 0                |
| Preparation of evaluation activities         | 10,00         | 0                |
| Preparing lectures                           | 30,00         | 0                |
| Preparation of practical classes and problem | 15,00         | 0                |
| <b>TOTAL</b>                                 | <b>150,00</b> |                  |

**TEACHING METHODOLOGY**

- Theoretical Lessons (30 Thematic Units). These lessons will be based on the master class method using the anatomical image that allows the recognition and the easy following of the theoretical description.
- Laboratory Practical Lessons (9 Thematic Units). The practical lessons will be based on the anatomical dissection of fixed cadaveric pieces, essential complement of theoretical lesson.
- Computer Practical Lessons (2 Thematic Units). They will be based on the study of the medical image with those aspects that allow to relate the anatomical knowledge with the clinical practice. X-ray images, magnetic resonance (MR) and computerized axial tomography (CAT) will be used.
- Tutored Groups. The lessons with these reduced groups will allow the precise formation in the dissection technique and in the preparation of practical descriptions to be exposed in the practical groups.



## EVALUATION

The final grade is established by the joint assessment of activities, written and oral tests in relation to the theoretical and practical content.

**Theoretical evaluation:** 60% of the final grade (6 points). It will be carried out by means of **written test** on the contents of the theoretical program and will have as objective to evaluate the acquisition of knowledge. The content of the test will be the same for all groups.

It consists of:

**Evaluation of 60 multiple choice questions** (5 answers, 1 true / 4 false). Qualification criteria: 0.1 point / correct answer. The formula for removal of the component will be applied by chance, that is, 0.025 points will be subtracted for each question that is not answered correctly. **This part will have a maximum value of 6 points.**

**The theoretical evaluation must be passed with a minimum of 3 points.**

**Practical evaluation:** 40% of the final grade (4 points). It will be carried out by means of the continuous evaluation of the participation in the different practical activities and with the accomplishment of a test that evaluates the acquisition of the knowledge related to the general and specific competences of the subject.

It consists of:

**1. Evaluation of 10 questions about anatomical structures,** views in the dissection room during the practical classes of the cadaver and anatomical preparations or models. **This part will have a maximum value of 2 points.**

**2. Evaluation of 10 questions about anatomical structures** through the different medical imaging techniques seen in the classroom, seminars and / or practical computer classes. **This part will have a maximum value of 1 point.**

**3. Continuous evaluation** of the acquisition of the general skills and of the expository work carried out in the tutored classes with the presence of the professor. **This part will have a maximum value of 1 point.**

**The practical evaluation must be passed with a minimum of 2 points** among all, being able to average whenever a 40% score is reached in each of them.

**In order to pass the subject the final grade must be at least 5 points,** being the result of the sum of theoretical and practical qualifications.



**Attendance is compulsory.**

If you do not attend to more than 20% of the practices and it is not justified, you will not be able to take the exam.

## REFERENCES

### Basic

- MOORE Y AGUR. Fundamentos de Anatomía con Orientación Clínica. 8ª ed. Ed. Panamericana.
- SCHUNKE M, SCHULTE E, SCHUMACHER U. (2017) Prometheus. Texto y Atlas de Anatomía, Vol. 1, 2 y 3. 3ª ed. Ed. Panamericana
- NETTER, F.H (2019) Atlas de Anatomía Humana. 7ª ed. Ed. Elsevier.
- PUTZ, REINHARD V. y PABST, REINHARD (2018), Sobotta Atlas de Anatomía Humana Vol 1, 2 y 3; 24ª ed. Ed. Elsevier.
- GOODMAN L.R. FELSON. (2009). Principios de radiología, un texto programado. Ed. McGraw Hill.
- DRAKE R.L., VOLG A.W., MITCHELL A.W.M. (2015) Gray. Anatomía para estudiantes. Madrid. 3ª ed. Ed. Elsevier.
- ESCOLAR, J. (2007) Anatomía humana funcional y aplicada. (2 Vol.) 5ª ed. Ed. Espaxs. Barcelona.
- GARCIA PORRERO, Juan A. (2005) Anatomía Humana. McGraw Hill. Madrid.
- H. ROUVIER, A. DELMAS. (2006) Anatomía funcional (4 tomos) 11ª ed. Ed. Elsevier.
- SCHUNKE M, SCHULTE E, SCHUMACHER U. (2017). Prometheus. Texto y Atlas de Anatomía, Vol. 1, 2 y 3. 3ª ed. Ed. Panamericana.
- MOLLER, T.B., REIF, E. (2015). Atlas de bolsillo de cortes anatómicos de TC y RNM. 4ª ed. Ed. Panamericana
- MOLLER, T.B. (2017) Atlas de anatomía radiológica. Ed. Marban.
- WEIR, J. (2017) Atlas de Anatomía Humana por técnicas de imagen. 5ª ed. Ed. Elsevier.
- FENEIS H, DAUBER W, (2008). Nomenclatura anatómica ilustrada. 5ª ed. Ed. Elsevier
- ROHEN J.W., YOKOCHI C., DRRECOLL L. (2015). Atlas de Anatomía Humana. Estudio fotográfico del cuerpo humano. 8ª ed. Ed. Elsevier.
- GRAYS ANATOMY. (2016). The Anatomical Basis of Clinical Practice. 41 ed. Ed. Elsevier.
- LOUKAS, BENNINGER, TUBBS. (2019). Gray. Guía fotográfica de disección del cuerpo humano 2ª ed. Ed. Elsevier.
- NIELSEN M, MILLER S. (2012). Atlas de Anatomía Humana. Ed. Panamericana.
- Guía de Nomenclatura Anatómica Internacional en latín, castellano, catalán e inglés (<http://visionmedicavirtual.com/es/terminologia-anatomica>)



- Atlas anatómico interactivo en 3D: Human Biodigital (<https://human.biodigital.com>).
- Atlas de Anatomía Humana interactivo 3D PRIMAL Pictures. Acceso gratuito desde la UV (<http://www.anatomy.tv>).

## **ADDENDUM COVID-19**

**This addendum will only be activated if the health situation requires so and with the prior agreement of the Governing Council**

Siguiendo las recomendaciones del Ministerio, la Consellería y el Rectorado de nuestra Universidad, para el período de la "nueva normalidad", la organización de la docencia para el segundo cuatrimestre del curso 2021-22, seguirá un modelo híbrido, donde tanto la docencia teórica como práctica se ajustará a los horarios aprobados por la CAT pero siguiendo un modelo de Presencialidad / No presencialidad en la medida en que las circunstancias sanitarias y la normativa lo permitan y teniendo en cuenta el aforo de las aulas y laboratorios docentes. Se procurará la máxima presencialidad posible y la modalidad no presencial se podrá realizar mediante videoconferencia cuando el número de estudiantes supere el coeficiente de ocupación requerido por las medidas sanitarias. De manera rotatoria y equilibrada los estudiantes que no puedan entrar en las aulas por las limitaciones de aforo asistirán a las clases de manera no presencial mediante la transmisión de las mismas de manera síncrona/asíncrona via "on line".