Universitat de Lleida

DEGREE CURRICULUM

HUMAN ANATOMY

Coordination: HERNÁNDEZ ESTAÑOL, SARA

Academic year 2023-24

HUMAN ANATOMY 2023-24

Subject's general information

<table>
<tr><td>Subject name</td><td>HUMAN ANATOMY</td></tr>
<tr><td>Code</td><td>100603</td></tr>
<tr><td>Semester</td><td>1st Q(SEMESTER) CONTINUED EVALUATION</td></tr>
<tr><td>Typology</td><td>
<table>
<tr><th>Degree</th><th>Course</th><th>Character</th><th>Modality</th></tr>
<tr><td>Bachelor's Degree in Human Nutrition and Dietetics</td><td>1</td><td>COMMON/CORE</td><td>Attendance-based</td></tr>
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</td></tr>
<tr><td>Course number of credits (ECTS)</td><td>9</td></tr>
<tr><td>Type of activity, credits, and groups</td><td>
<table>
<tr><th>Activity type</th><th>PRALAB</th><th>PRAULA</th><th>TEORIA</th></tr>
<tr><th>Number of credits</th><td>1.6</td><td>2</td><td>5.4</td></tr>
<tr><th>Number of groups</th><td>3</td><td>2</td><td>1</td></tr>
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</td></tr>
<tr><td>Coordination</td><td>HERNÁNDEZ ESTAÑOL, SARA</td></tr>
<tr><td>Department</td><td>EXPERIMENTAL MEDICINE</td></tr>
<tr><td>Teaching load distribution between lectures and independent student work</td><td>H. lectures, seminars, practices 90
H. Independent student work 135</td></tr>
<tr><td>Important information on data processing</td><td>Consult this link for more information.</td></tr>
<tr><td>Language</td><td>Catalan
Spanish
English</td></tr>
<tr><td>Distribution of credits</td><td>Credit distribution.
90 hours
Theory: 54h
Practices (2 hours/practice): 2 Anatomy practices + 6 Histology practices
Seminars (2 hours/seminar): 6 Anatomy seminars + 4 Histology seminars</td></tr>
</table>

Teaching staff	E-mail addresses	Credits taught by teacher	Office and hour of attention
GARCERA TERUEL, ANA	ana.garcera@udl.cat	1,8	
HERNÁNDEZ ESTAÑOL, SARA	sara.hernandez@udl.cat	6,5	
SOLER TATCHE, ROSA MARIA	rosa.soler@udl.cat	2	
TARABAL MOSTAZO, OLGA	olga.tarabal@udl.cat	3,9	

Subject's extra information

The subject is a compulsory basic education that is taught in the first semester of the first year of the degree in Human Nutrition and Dietetics.
The aim of the course is that students know and to acknowledge the anatomical and histological structure of different systems and devices normal human body at different stages of life (from the embryonic stage to old age) giving particularly relevant systems related to food processes, such as the digestive and endocrine system.
It also aims to integrate what students know and apply the knowledge to understand and interpret human physiology and pathology, especially those related to food processes.
Various resources will be used to facilitate the achievement of the theoretical and practical objectives of this subject, giving special relevance to histological and anatomical images. In addition, work will be done on the acquisition of transversal skills such as teamwork, transmission of knowledge and the development of skills related to new technologies.

Information on the transmission and recording of personal data of teachers and students of the University of Lleida as a result of teaching in facilities of the UdL and at a distance.

The University of Lleida informs that, depending on the changes to which it is obliged in accordance with the instructions of the health authorities, the provisions of the UdL or the assurance of the quality of teaching, it may transmit, record and use the image, voice or, where appropriate, the physical environment chosen by teachers and students, with the aim of teaching in UdL facilities or at a distance. In turn, it encourages the people affected to, in the case of distance learning, choose the spaces that have the least impact on their privacy. And, in general, it is recommended to opt preferably for interactions in the chat or without activating the camera, when teaching activities are not carried out that, due to their characteristics, require an oral or visual interaction. The person responsible for the registration and use of this personal data is the University of Lleida –UdL– (contact details of the representative: General Secretariat. Plaça de Víctor Siurana, 1, 25003 Lleida; sg@udl.cat; data contact details of the data protection delegate: dpd@udl.cat). This personal data will be used exclusively for the purposes inherent in the teaching of the subject. In particular, the recording fulfills the following functions: • Provide access to online content and, where appropriate, asynchronous training. • Guarantee access to content for students who, due to technological, personal or health reasons, among others, have not been able to participate. • Constitute a study material for the preparation of the evaluation. The use of the transmitted data and recordings for other purposes, or in areas outside the Virtual Campus, where they will remain archived, in accordance with the intellectual and

industrial property policy of all content included on proprietary websites, is strictly prohibited. of the UdL. If there are any, the records will be kept for the time decided by the teacher, in accordance with strictly academic criteria, and, in all likelihood, must be removed at the end of the current academic year, in the terms and conditions provided for in the regulations on the conservation and disposal of the UdL's administrative documents, and the document evaluation tables approved by the Generalitat de Catalunya (http://www.udl.cat/ca/serveis/arxiu/).

These personal data are essential to teach in the subject, and the definition of teaching procedures, especially that made at a distance, is a power of the UdL in the framework of its right to university autonomy, as provided Article 1.1 and Article 33.1 of Organic Law 6/2001, of 21 December, on Universities. For this reason, the UdL does not need the consent of the people affected to transmit or record their voice, image and, where applicable, the physical environment they have chosen, for this sole purpose, to teach. teaching in the subject. The UdL will not transfer the data to third parties, except in the cases strictly provided for in the Law. Affected people can access their data; request rectification, deletion or portability; oppose the treatment and request its limitation, provided that it is compatible with the purposes of teaching, by writing to the address dpd@udl.cat. They can also submit a complaint to the Catalan Data Protection Authority, through the Authority's electronic office (https://seu.apd.cat) or by non-electronic means.

Learning objectives

1) **At the level of knowledge:**
1.1. To know and understand the concepts of tissue, apparatus and body system.
1.2. To know and differentiate the basic histological structure of the different tissues of the human body.
1.3. Knowing the histological bases appliances and body systems, and in more detail the digestive and endocrine system.
1.4. To know and differentiate the basic anatomical structure of the different systems of the human body, especially the digestive and endocrine system.
1.5. Knowing the basics of the development of the human body, from the embryonic stage to adulthood, as well as their evolution into old age.
1.6. Know the terminology and basic scientific language related to Histology and Anatomy.

2) A level of capabilities and application:
2.1. To know and distinguish the different tissues of the human body in microscopic images.
2.2. To know and distinguish the different systems of the human body in macroscopic preparations and anatomical models, as well as images obtained with different techniques medical examination and radiography, tomography and resonance.
2.3. To know how to integrate and apply the acquired concepts about the normal structure of the body to understand and interpret human physiology and pathology.
2.4. Learning to use texts and atlases of Histology and Anatomy to selectively seek the necessary information.
2.5. To understand, interpret and critically discuss scientific articles based on histological and anatomical works.
2.6. Learning to perform work together to solve problems.
2.7. Knowing how to use the computer training necessary for technological environment; mainly the Virtual Campus, finding information online and manage user-level computer packages.
2.8. To find and select the information obtained using computer tools to analyze and process, while acquiring habits of self-education.

3) At the level of values ??and attitudes:
Understanding the need for basic morphological formation of the human body for professional future in the field of health sciences.

Competences

Specifics

CE2 To know the structre and fuction of the human body from the molecular level to the complete organism, in the different stages of life.

Transversals

CG3 To recognize one's own limitations and the need to maintain and update professional competence, giving special importance to autonomous and continuous learning of new knowledge.
CG4 To communicate effectively, both orally and in writing, with people, health or industry professionals and the media, knowing how to use information and communication technologies, especially those related to nutrition and lifestyle.
CG5 To know, critically assess and know how to use and apply information sources related to food and nutrition.
CB3 That students had the ability to gather and interpret relevant data (normally within their area of study) to make judgments that include a reflection on relevant issues of a social, scientific or ethical nature.
CB4 That students could transmit information, ideas, problems and solutions to both specialized and non-specialized audiences.
CT1 To have correct oral and written expression.
CT2 To master a foreign language.
CT5 To acquire essential notions of scientific thought.
To master ICT

Subject contents

Human Anatomy [1]

1. Basics structure of the human body. Anatomical bases. Definition of tissues, organs, systems, devices. Anatomical position. Plans, axis movements.

2. Embryology general. General aspects of embryonic and fetal development.

3. Anatomy of the locomotor system. Skeletal and muscular systems. Basics of the axial skeleton (head and trunk) and members. Basics of the muscles of the trunk, head and members. Basics of vascularization and innervation.

4. Nervous system (1). Introduction. Brain. Brain areas. The brain stem. Cerebellum. White matter and gray matter, cortex and nucleus. Cranial nerves. Rhinencephalon. Vegetative system, sympathetic and parasympathetic

5. nervous system (2). Meninges, ventricular cavities. Cerebral spinal fluid. Vascularization. Medul.la cord. Spinal nerves.

6. Anatomy of the cardiovascular system. Heart and great vessels. Pericardium. Coronary vessels. Innervation and cardiac conduction system. Lymphatic system. Mediastinum.

7. Anatomy of the respiratory system. Nostrils. Larynx and phonation. Firecrackers. Bronchi and lungs. Pleura. Vascularization and innervation.

8. Digestive (1). Oral cavity. Temporomandibular joint and Ms. Chewing.
Teeth. Language. Salivary glands. Vascularization and innervation.

9. Digestive (2). Pharynx. Communications and relations with AD. Respiratory. Endocrine glands of the neck. Description and relationships. Esophagus, structure, and relations mediastinal route.

10. Digestive (3). Compartimentització peritoneum and the abdominal cavity.
Supramesocòlic compartment. Setting limits and content. Stomach. Vascularization and innervation.
Pancreas-duodenum. Spleen. Morphology and relationships. Vascularization and innervation.

11. Digestive System (4). Liver. Morphology and relationships. Vascularization and innervation.
Biliary tract, intra- and extrahepatic. Relationships.

12. Digestive (5). Inframesocòlic compartment. Small intestine. Jejunum-ileum. Description, provision and relationships. Vascularization.
Large intestine. Blind, ascending colon, transverse and descending. Relationships, vascularity. Sigmoid colon. Straight. Morphology and relations with the pelvis. Vascularization.

13. Urinary System. Glands and kidneys. adrenals. Relations, location and vascularization.
Ureter, bladder and urethra. Relations and differences by sex. Vascularization.

14. Reproductor.Aparell male reproductive system. Testicle. Epididymis. Vas. Scrotum and spermatic cord. Penis and erectile bodies. Annexes glands and relationships. Vascularization.

15. reproductive system. Female reproductive system. Ovaries and uterine tubes. Uterus. Vagina. Vulva. Annexes glands and relationships. Mammary glands. Vascularization.

Human histology

1. Introduction to the study of tissues, organs and body systems.
Concept of tissue. Constituent elements of tissue: cells, extracellular matrix, tissue fluid. Classification of tissues. The concept of device and system.

2. The epithelial tissue and connective tissue. Concept, origin and distribution of the epithelial lining. General structure. Classification of epithelia. Epithelium and glandular epithelium lining. Concept and general organization of the connective tissue. Structure and composition of the extracellular matrix: fibers and connective tissue basic substance. Connective tissue cells. Variety of connective tissue. Histofiosiologia.

3. Cartilage and bone tissue. Concept of cartilage. Chondrocytes and cartilage matrix. Nutrition cartilage. Types of cartilage. Involutius processes. Concept of bone tissue. The bones and their constituent elements. Macroscopic structure of the bones. Microscopic structure of the bones. Vascularization and innervation of the bone. Histophysiology.

4. Muscle and nerve tissue. Concept and classification of muscle tissue. Histological Organization of skeletal muscle. Composition of the concept of sarcomeres and miofibretes. The cardiac muscle fiber and smooth muscle fiber. The nervous tissue: neuron, synapse and neuroglia. General morphology and structure of the neuron. Types of neurons. Concept of synapses. Classification of synapses. The endplate or neuromuscular synapse: structure and histophysiology. Neuroglía concept and classification. Definition of nerve fiber. Structure and classification of nerve fibers. The myelin sheath. Histophysiology.

5. The integumentary system. General structure of the skin. The epidermis, the dermis and subcutaneous fat: structure and regional variations. The queratinòcit and the process of keratinization. Melanocytes, Langerhans cells and Merkel cells. The annexes of the skin hair, nails and glands of the skin. Vascularization and innervation of the skin.

6. Blood and hematopoiesis. Concept and composition of the blood. Blood cells: structure and function. The leukocyte formula in health. Platelets: structure and function. Concept of hematopoiesis. Organization histologic bone marrow. Formation of blood cells and platelets.

7. The circulatory system. Concept. Components tissue and basic organization of the vascular wall. Nutrition and innervation of the vascular wall. General structure and classification of capillaries, arteries and veins. General Organization of the heart. Vascularization and innervation of the heart. Histophysiology.

8. Respiratory. Concept respiratory system. The conductive portion and respiratory area. Nasopharynx, larynx, trachea and bronchi extrapulmonary. Lungs: internal structure. Histological structure of the airways intrapulmonars. The alveoli: structure of the alveolar wall and alveolar cells. The pleura. Vascularization and innervation of the lungs. Histophysiology of the respiratory system.

9. Digestive (I): oral cavity, tongue, teeth and salivary glands. Concept digestive system. General structure of the digestive tract. Oral cavity: histological organization. The palate. Language: mucosa and lingual papillae. Buttons taste. Overview and types of teeth. Histological structure of teeth dentine, enamel, cement, pulp, periodontal membrane. The alveolar bone. The gum. Irrigation and innervation of the teeth. The salivary glands: concept and overall structure.

10. Digestive System (II): pharynx, esophagus and stomach. Pharynx and esophagus: histological structure. Oesophageal glands. The stomach: histological structure and organization of its wall. The gastric glands: classification and cytology. Cell renewal and repair of the gastric epithelium. Vascularization and innervation.

11. Digestive (III): intestinal glands and the digestive tract. The small intestine: histological organization of its wall; specializations superficial mucosa; Pap epithelium; Histological regional differences. The large intestine: histological structure; Pap epithelium of the large intestine. Cell renewal and regeneration of the intestinal

epithelium. Microscopic architecture of the liver. Concept lobulació liver. The hepatocyte: cytology and function. Liver regeneration. Gallbladder and bile ducts. Concept and overall structure of the pancreas. Histological organization of the exocrine pancreas. Vascularization and innervation.

12. Endocrine system (I): The pituitary and thyroid and parathyroid glands. The concept of the endocrine system. General characteristics of the endocrine glands and diffuse neuroendocrine system. The pituitary: general structure; the adenohypophysis and neurohypophysis. Histological structure of the thyroid gland. Cells that make up the gland. Histological structure of the parathyroid. Cells that constitute the parathyroid glands. Vascularization and innervation. Histophysiology.

13. Endocrine system (II): adrenal gland, endocrine pancreas, pineal gland and diffuse neuroendocrine system (SND). Structure of the adrenal gland: the cortex and medulla. Cytology cortical and medullary cells. The endocrine pancreas: structure and cytology of the islets of Langerhans islet cells. The pineal gland: histological organization. Vascularization and innervation. Concept of SND. Distribution of the cells of SND. Structure of neuroendocrine cells. Histophysiology.

14. Urinary tract. Concept of urinary tract. The kidney histological structure general. The nephron. The tubes collectors. The renal interstitial. The juxtaglomerular apparatus. General histological structure of the urinary excretory: calyces, the renal pelvis and ureter. The urinary bladder. The male urethra. The female urethra. Vascularization and innervation. Histophysiology.

15. reproductive system. The concept of reproductive system. General provision of the male reproductive system. The testicle: general structure. The seminiferous tubules and interstitial tissue. The roads sperm. Accessory glands. General provision of the female reproductive system. Ovary: structure general. The ovarian follicles and interstitial tissue. Fallopian tubes, uterus, cervix and vagina. Vascularization and innervation. Histophysiology.

Methodology

Lectures
Classroom lectures aim to give an overview of the theoretical contents which are on the agenda. We give special importance to issues directly related to human nutrition.

Seminars
A) Anatomy Seminars: To strengthen the anatomical knowledge of the human body, particularly those related to the digestive system, there will be seminars on clinical problems will arise. It will show pupils the normal anatomy and pathological alteration.
B) Histology Seminars: To improve understanding of the matter, there will be different types of seminars in groups of 20 students:
Seminars in computer classroom: interactive programs used histology.
Deepening Seminars: will be activities to delve into topics more complex matter.
Seminars interpretation of micro-histological preparations.

Practices
Attendance at practices is mandatory. They will practice with groups of 20 students.
A) Practical Anatomy: To strengthen the anatomical knowledge of the human body, there will be practices in Osteoteca with anatomical models. Also in the dissection room of human organs from corpses
B) Practical Histology: They will be carried out in the computer room using virtual microscopy programs for the observation of histological preparations of the body's tissues and organs. Assigments will be carried out individually or collectively (teamwork), and will mainly be aimed at deepening the observation and interpretation of anatomical and histological images. Virtual self-assessment activities will be proposed to facilitate the monitoring of students' progress in acquiring the knowledge of the subject, through the TEST tool of the virtual campus.

Evaluation

Evaluation.

Continuous Evaluation.

Theoretical and practical knowledge of this subject, including seminar knowledge and skills, will be evaluated by means of different tests throughout the semester.

All the tests will be face-to-face.

The evaluation of microscopic and macroscopic components explained in the lectures, seminars and practices will be **INTEGRATED**. For this reason, it will not be part of Anatomy nor part of Histology.

1st theory mid-term exam: 35% of the final mark

1st practice and seminar mid-term exam: 13% of the final mark

2nd theory mid-term exam: 35% of the final mark

2nd practice and seminar mid-term exam: 13% of the final mark

4% coursework, Activities, Practices and seminars attendance.

Alternative evaluation.

To facilitate work or familiar balance, the students could resign from the continuous evaluation at the beginning of the semester and aim for the alternative evaluation.

The alternative evaluation lies on a single test that will be 100% of the subject final mark.

In that case, practice attendance will be mandatory. Seminar attendance will be optional.

To pass this subject, the final mark has to be or greater than 5.

Bibliography

EMBRIOLOGY TEXTS

SADLER T.W. ***LANGMAN . Embriología Médica, con orientación clínica.*** Ed. Panamericana.

LARSEN W. J. ***Embriología humana.*** Ed. Elsevier, 2003.

ANATOMY TEXTS

MOORE, DALLEY. ***Anatomía con orientación clínica.*** Ed. Panamericana,

MARIEB E.N. ***Anatomía y Fisiología.*** Ed. Pearson Education- Addison Wesley, 2008

SNELL R.S. ***Anatomía Clínica, 6ª Ed.*** McGraw-Hill - Interamericana de España S.A.

TORTORA-DERRICKSON. ***Principios de Anatomia y Fisiologia.*** Ed. médica Panamericana

HISTOLOGY TEXTS

GARTNER L.P., HIATT J.L. ***Histología Básica.*** Ed. Elsevier España, 2011.

GARTNER L.P., HIATT J.L. ***Histología. Texto y Atlas.*** Ed. McGraw-Hill Interamericana, 2002.

JUNQUEIRA L.C., CARNEIRO J. ***Histología Básica.*** Ed. Masson, 2005.

KIERSZENBAUM A.L. ***Histología y Biología Celular.*** Ed. Elsevier Mosby, 2008.

STEVENS A., LOWE J. ***Histología Humana.*** Ed. Harcourt Brace, 2006.

YOUNG B., HEATH J.W. ***Wheater's Histología Funcional. Texto y Atlas.*** Ed. Harcourt, 2000.

MARTÍN V. ***Técnicas en Histología: ¿Cómo se obtienen las muestras que se estudian al microscopio?*** . Amazon 2017

ANATOMY AND RADIOLOGY ATLAS

SOBOTTA. ***Atlas de Anatomía.*** Ed. Panamericana.

NETTER. ***Atlas de Anatomía Humana.*** Ed. Masson.

FLECKENSTEIN; TRANUM-JESSEN. ***Bases Anatómicas del Diagnóstico por Imagen. 2ª Edición.*** Ediciones Harcourt-Elsevier.

HISTOLOGY ATLAS D' HISTOLOGIA

BOYA J. ***Atlas de Histología y Organografía MIcroscópica.*** Ed. Panamericana, 2004.

GARTNER. ***Atlas color de Histología.*** Ed. Panamericana, 2003.

GENESER F. ***Atlas color de Histología.*** Ed. Panamericana, 1992.

ROSS M.H., REITH E.J. ***Atlas de Histología.*** Ed. Doyma, 1987.

MARTÍN V. ***Atlas básico de Histología I: Tejidos: Manual para prácticas de Histología.*** Amazon 2017

MARTÍN V. ***Atlas básico de Histología 2. Órganos y Sistemas***. Amazon 2017

LINKS OF INTEREST IN ANATOMY

- http://www.med.harvard.edu/AANLIB/home.html
- http://www.lumen.luc.edu/lumen/meded/grossanatomy/x_sec
- http://sprojects.mmi.mcgill.ca/radiology/
- http://www.med.wayne.edu/diagRadiology/Anatomy_Modules/Page1.html
- http://library.med.utah.edu/kw/brain_atlas/
- http://www.medicalstudent.com

LINKS OF INTERES IN HISTOLOGY

A digital atlas. General Histology. University of Southern California School of Dentristy: http://www.usc.edu/hsc/dental/ghisto/

Histology Course Web Site. College of Medicine. University of Illinois at Urban-Champaign: http://www.med.uiuc.edu/histo/small/atlas/slides.htm

Histology. Southern Illinois University School of Medicine: http://www.siumed.edu/~dking2/index.htm

Human Microscopy Anatomy. UC Davis Health System: http://medocs.ucdavis.edu/CHA/402/course.htm

JayDoc HistoWeb. Department of Anatomy and Cell Biology. University of Kansas: http://www.kumc.edu/instruction/medicine/anatomy/histoweb/index.htm

Mammalian Histology-B408. Department of Biological Sciences. University of Delaware: http://www.udel.edu/Biology/Wags/histopage/histopage.htm

Microanatomy Web Atlas. University of Texas Medical Branch: http://cellbio.utmb.edu/microanatomy/

PERLjam 2.01. Histology Image Atlas. Departament of Pathology and Laboratory Medicine. Indiana University Medical Center: http://erl.pathology.iupui.edu/

Web de Histología Humana. Facultad de Medicina de la Universidad de Salamanca:

http://www3.usal.es/~histologia/