UAB
Universitat Autònoma de Barcelona

Structural and Molecular Pathology

Code: 102927
ECTS Credits: 8

2025/2026

Degree	Type	Year
Medicine	OB	3

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Teaching groups languages

You can view this information at the end of this document.

Prerequisites

There are no prerequisites, but it is highly recommended that the student has achieved some basic competencies

1. General and specific anatomy of the different organs and systems.

2. General and specific histology of different organs and systems

3. Molecular biology

4. Cell biology

It is also advisable to have gained sufficient knowledge in:

1. Biochemistry

2. Biostatistics

3. Epidemiology

4. English

The student will acquire the commitment to preserve the confidentiality and professional secrecy of the data that

health care services. Also by maintaining an attitude of professional ethics in all its actions.

Objectives and Contextualisation

The subject is programmed in the third year of the Degree of Medicine, which corresponds to the beginning of the clinical period, once the basic knowledge about the structure and function of the human body has been obtained and before entering the study of the different medical and surgical pathologies and in clinical practice.

Pathology is the part of the medical sciences in which, through the correlation of structural alterations of organelles, cells, tissues, organs and systems with biochemical, genetic, molecular, clinics and radiology, provides the scientific basis for the understanding of etiopathogenesis and pathophysiology of pathological processes. From a practical point of view, Pathological Anatomy plays a significant role in the definitive diagnosis of a large number of diseases.

The specific objective is to provide the student with a global knowledge of the morphological and molecular bases of the pathology of the organs and systems, as well as the knowledge of the basic techniques used in Pathological Atomic Laboratories.
The student must be able to recognize the fundamental morphological alterations of the different tissues of the organism and interpret them properly. In addition, the student will have to become familiar with the histopathology of the most frequent illnesses, their gradation and their prognosis, as well as the use of the clinical-pathological correlation.

Competences

- Communicate clearly, orally and in writing, with other professionals and the media.
- Convey knowledge and techniques to professionals working in other fields.
- Critically assess and use clinical and biomedical information sources to obtain, organise, interpret and present information on science and health.
- Demonstrate a sufficient command of English, both oral and written, for effective scientific and professional communication.
- Demonstrate, in professional activity, a perspective that is critical, creative and research-oriented.
- Demonstrate understanding of the basic sciences and the principles underpinning them.
- Demonstrate understanding of the causal agents and the risk factors that determine states of health and the progression of illnesses.
- Demonstrate understanding of the functions and interrelationships of body systems at different levels of organisation, homeostatic and regulatory mechanisms, and how these can vary through interaction with the environment.
- Demonstrate understanding of the manifestations of the illness in the structure and function of the human body.
- Demonstrate understanding of the mechanisms of alterations to the structure and function of the systems of the organism in illness.
- Demonstrate understanding of the structure and function of the human organism in illness, at different stages in life and in both sexes.
- Engage in professional practice with respect for patients' autonomy, beliefs and culture, and for other healthcare professionals, showing an aptitude for teamwork.
- Formulate hypotheses and compile and critically assess information for problem-solving, using the scientific method.
- Recognise the basic elements of the medical profession as the result of an evolving, scientific, social and cultural process, including ethical principles, legal responsibilities and patient-oriented professional practice.

Learning Outcomes

1. Communicate clearly, orally and in writing, with other professionals and the media.
2. Convey knowledge and techniques to professionals working in other fields.
3. Critically assess and use clinical and biomedical information sources to obtain, organise, interpret and present information on science and health.
4. Critically interpret scientific texts.

5. Define the disorders of cell growth.
6. Demonstrate a sufficient command of English, both oral and written, for effective scientific and professional communication.
7. Demonstrate, in professional activity, a perspective that is critical, creative and research-oriented.
8. Describe the basic anatomopathological characteristics of infections and the factors that favour their development.
9. Describe the biochemical, cytogenetic and molecular biology markers applied to clinical diagnosis of importance to anatomopathological diagnosis.
10. Describe the characteristics of tissues in the different situations of injury, adaptation and cell death.
11. Distinguish situations in which confidentiality must be applied to the results of pathological anatomy studies.
12. Explain the anatomopathological alterations of the commonest diseases in the different body systems, at different stages in life and in both sexes.
13. Explain the importance of accepting, evaluating fairly and integrating the opinions of fellow healthcare professionals when taking decisions.
14. Explain the mechanisms of anatomopathological alterations of the commonest diseases of the different body systems.
15. Explain the morphological characteristics of the different mechanisms of inflammation and repair.
16. Formulate hypotheses and compile and critically assess information for problem-solving, using the scientific method.
17. Identify inflammations and alterations to cell growth.
18. Identify situations in which pathological anatomy diagnostic techniques require informed consent.
19. Identify situations in which the use of pathological anatomy studies for teaching and research requires informed consent.
20. Identify the degree of diagnostic uncertainty in every situation and identify situations in which a second opinion should be sought.
21. Identify the general and local factors that affect the development of diseases.
22. Identify the indications of anatomopathological tests.
23. Identify the indications of biochemical, haematological and anatomopathological tests.
24. Identify the mechanisms of inflammation and repair, and their causes, etiopathogenic mechanisms and evolution.
25. Obtain and process a biological sample to be studied through pathological anatomy.
26. Present scientific papers and/or professional reports orally and in writing.
27. Recognise the manifestations of the main pathologies on the structure and function of the human body.
28. Use biomedical information retrieval systems.

Content

The subject consists of two parts: a General, whose objective is the learning of the basic concepts, the language

diseases, and a specific one, that deals with the ethiopathogenic aspects basic, morphologic, diagnoses and prc

system.

Theoretical classes: 64 hours

1. General structural and molecular pathology

1. Presentation. Introduction to Pathological Anatomy. From the origins to digital and computational pathology.

2. Cellular pathology I. Adaptation and differentiation. Injury and cell death.
3. Cellular pathology II. Type of necrosis. Apoptosis. Environmental pathology
4. Cellular pathology III. Subcellular alterations. Lipid deposits.
5. Cellular pathology IV. Protein and carbohydrate stores. Pigments. Calcification
6. Inflammation I. Concept, hemodynamics, permeability.
7. Inflammation II. Exudation, chemotaxis, phagocytosis.
8. Inflammation III. Chemical mediators for inflammation and tissue repair.
9. Inflammation IV. Inflammation patterns and Granulomatous inflammation.
10. Haemodynamics I. Hyperaemia, oedema, haemorrhage, thrombosis and embolism.
11. Hemodynamics II. Disseminated intravascular coagulation, infart and shock.
12. Hemodynamics III. Arteriosclerosis and hypertension.
13. Immunopathology I. Pathology of immune disorders.
14. Immunopathology II. Immunodeficiencies. Rejection of transplants.
15. Immunopathology III. Amyloidosis. Rare diseases with morphological changes
16. Neoplasia I. Definitions, terminology and epidemiology. Benignity and malignancy.
17. Neoplasia II. Molecular bases of cancer I.
18. Neoplasia III. Molecular bases of cancer II.
19. Neoplasia IV. Physical, chemical and viral carcinogenesis.
20. Neoplasia V. Biology of tumor growth and tumor-host interaction.
21. Neoplasia VI. Diagnosis and prognosis of neoplasms.
22. Neoplasia VII. Precision Medicine and Molecular Tumor Board. NGS and liquid biopsy.
23. Introduction to clinical cytology.
24. Bacterial and fungal infectious diseases.
25. Infectious diseases caused by protozoa, helminths and viruses.
26. Malformative pathology. Hereditary diseases.
27. Perinatal pathology. Pediatric tumors.

II. Specific structural and molecular pathology of organs and systems:

1. Cardiovascular pathology I. Ischemic heart disease.
2. Cardiovascular pathology II. Endocardial and valvular disorders.
3. Cardiovascular pathology III. Cardiomyopathies, pathology of the pericardium. Cardiac tumors.
4. Pulmonary pathology I. Chronic obstructive pulmonary disease.
5. Pulmonary pathology II. Restrictive lung disease.
6. Pulmonary pathology III. Pulmonary and pleural tumors.
7. Hematopathology I. Lymphadenitis and thymic pathology.
8. Hematopathology II. Hodgkin's lymphomas. Bone marrow biopsy
9. Hematopathology III. Non-Hodgkin's lymphoma (1)
10. Hematopathology IV. Non-Hodgkin lymphoma (2).
11. Pathology of the digestive tract I. Esophagus and stomach.
12. Pathology of the digestive tract II. Pathology of the small intestine. Malabsorptive pathology. Tumors
13. Pathology of the digestive tract III. Pathology of the colon. Inflammatory bowel disease.
14. Pathology of the digestive tract IV. Pathology of the colon. Tumors
15. Hepatic pathology I. Liver physiopathology. Cirrhosis. Cholestasis
16. Liver pathology II. Primary and secondary hepatic diseases.
17. Liver pathology III. Hepatic tumors. Pathology of the pancreas and bile ducts.
18. Nephropathology I. Glomerulonephritis.
19. Nephropathology II. Renal vascular pathology. Renal tumors.
20. Urological pathology I. Pathology of the urothelium.
21. Urological pathology II. Pathology of the prostate and testicle
22. Gynecological pathology I. Vulva, vagina and uterine cervix.
23. Gynecological pathology II. Uterine body
24. Gynecological pathology III. Fallopian tube and ovary.
25. Breast pathology.
26. Endocrine pathology I. Pituitary gland, thyroid and parathyroid.
27. Endocrine pathology II. Adrenal, endocrine pancreas. Multiple endocrine disease.
28. Non-tumoral cutaneous pathology.
29. Tumoral cutaneous pathology.
30. Bone pathology

31. Soft tissue pathology.
32. Head and neck pathology.
33. Neuropathology I: Cerebrovascular diseases. Traumatism, malformations
34. Neuropathology II. Infections, Toxic and metabolic injuries.
35. Neuropathology III. Neurodegenerative and demyelinating diseases.
36. Neuropathology IV. Tumors of the central nervous system. Phacomatosis
37. Neuropathology V. Peripheral nerve and muscle pathology

Seminars of clinical cases: 7 hours

1. Seminar clinical case 1
2. Seminar clinical case 2
3. Seminar clinical case 3
4. Seminar clinical case 4
5. Seminar clinical case 5
6. Seminar clinical case 6
7. Seminar clinical case 7

Advanced Clinical Skills Practices: 5 hours

Application and correlation between the different techniques of the specialty: PAAF, intraoperative, molecular and

Clinical practices: 14 hours

Care activity at the Pathological Anatomy Service: Clinical Autopsy, Surg

Language of instruction

Mainly in Catalan, but also in Spanish and English (see the Teaching Plan)

Activities and Methodology

Title	Hours	ECTS	Learning Outcomes
Type: Directed			
ADVANCED CLINICAL SKILL PRACTICES (PHCA)	5	0.2	7, 8, 10, 13, 12, 15, 24, 20, 17, 22, 25
ASSISTENCIAL CLINICAL PRACTICES (PCA)	14	0.56	5, 9, 10, 11, 14, 15, 16, 24, 17, 22, 25, 27
CLINICAL CASES SEMINARS (SCC)	7	0.28	9, 14, 15, 24, 17, 23, 27
THEORY (TE)	64	2.56	9, 8, 13, 12, 14, 15, 21, 24, 17, 23, 18, 19, 25, 27
Type: Autonomous			
Papers elaboration	10	0.4	1, 7, 6, 9, 2, 13, 26, 20, 23, 27, 3
PERSONAL STUDY / READING OF ARTICLES / INTEREST REPORTS	90	3.6	4, 28, 3

This Guide describes the framework, contents, methodology and general norms of the subject, in accordance with the current curriculum. The final organization of the subject with regard to the number and size of groups, distribution in the calendar and dates of examinations, specific criteria of evaluation and review of exams, will be specified in each one of the Hospital Teaching Units (UDH), which will be explained through their web pages and the first day of class of each subject, through the teachers responsible for the subject at UDH.

For the present year, the professors appointed by the Departments as responsible for the subject at the Faculty level and the UDH are:

Department responsible: Morphological Sciences Department:

Faculty responsible: Joan Carles Ferreres Piñas

UDH responsibles:

nsUD Vall d'Hebron: Santiago Ramón and Cajal Agüeras and Ines De Torres

UD Germans Trias i Pujol: Pedro Luís Fernández Ruiz and Gustavo Tapia Melendo

UD Sant Pau: Enrique Lerma Puertas

UD Parc Taulí: Joan Carles Ferreres Piñas

DESCRIPTION OF THE TEACHING ACTIVITIES

Theoretical classes

Theoretical classes will have to provide knowledge about the morphological and molecular bases of illnesses and help the student acquire specific knowledge about the etiology, histopathological diagnosis, gradation and prognosis of the most frequent diseases. 64 sessions of 1 hour.

These classes will be blended, ensuring fairness and security to all the students.

Seminars of clinical cases* (clinical and pathological sessions)

Clinic-pathological sessions will provide the studentwith the necessary skillsto use the knowledge acquired in the theoretical classes, by analyzingand solving a series of cases related to the different blocks of the subject, and familiarizing themselves with the process of clinical-pathological correlation. The subject matter can be evaluated to the theoretical-practical exam.7 hours.

Assistencial Clinical Practices*:

Through these practices students must obtain the knowledge of the autopsy technique, as well as know the procedure of study and management of the cytologies, biopsies and surgical specimens, their processes of technification, the applicability of the complementary and molecular techniques , and acquire some basic skills. 14 hours.

Practices of advanced clinical skills*

These practices must enable students to become acquainted with the pre-psychological manipulation, the study of the microscope and their operation and their possibilities. They must also ensure that the student is able to recognize the different tissues microscopically, to evaluate different histopathological alterations and to perform an adequate clinical-pathological correlation. 5 hours.

*All seminars and practices will be performed face to face. However, depending on the number of students, the size of the groups and the duration can be modified.

Use of AI:

For this subject, the use of Artificial Intelligence (AI) technologies is permitted exclusively in support tasks, such as bibliographic or information searches, text correction or translations, in the event that optional activities such as the preparation of assignments are carried out. The student must clearly identify which parts have been generated with this technology, specify the tools used and include a critical reflection on how these have influenced the process and the final result of the activity. The lack of transparency in the use of AI in this assessable activity will be considered a lack of academic honesty and may lead to a partial or total penalty in the grade of the activity, or greater sanctions in serious cases.

Annotation: Within the schedule set by the centre or degree programme, 15 minutes of one class will be reserved for students to evaluate their lecturers and their courses or modules through questionnaires.

Assessment

Continous Assessment Activities

Title	Weighting	Hours	ECTS	Learning Outcomes
Practical evaluation through objective tests	25%	4	0.16	1, 7, 2, 13, 12, 15, 16, 20, 17, 23
Theoretical evaluation through	75%	6	0.24	5, 6, 9, 8, 10, 11, 12, 26, 14, 15, 21, 24, 17, 22,

objective tests	18, 19, 4, 25, 27, 28, 3

This subject does not provide for the single assessment system.

The competences of this subject w
ill be evaluated with a relative weight of the theoretical examination of 75%, of the practical examination of 25%,

The theoretical-practical exam will consist of items of multiple choice and restricted questions.

- In the multiple choice test questions, incorrect answers will deduct 0.25.

- There will be a minimum of three partial assessments (continuous assessment), at the end of each quarter, as well as a final recovery test. Each partial exam will have a weight of 33.3% in the final grade of the subject.

- The partial assessment must be passed with a grade equal to or greater than 5 out of 10 to release the subject.

Students who have not passed the subject through continuous assessment may take the final retake exam, provided that they have previously been assessed in a set of activities whose weight is equivalent to a minimum of two-thirds of the total grade for the subject.

In exceptional situations (manifest impossibility of attending the exam), and always at the discretion of the professor responsible for the subject in the Teaching Unit, the possibility of taking a special oral exam will be considered.

Students who do not take both the theoretical and practical assessment tests will be considered "Not Assessable", exhausting their rights to register for the subject.

Optionally, continuous assessment tests not scheduled during theoretical classes, or of other types, can be taken, which in the event of satisfactory results can be used to raise the grade, up to a maximum of 5% of the finalgrade. In no case will the grade of the partial exams or the final synthesis test be lowered.

Minimum requirements: to pass the subject, you must have attended 80% of the practical activities and seminars.

Final grade: Weighted sum of the theoretical-practical knowledge assessments

Qualitative grade: Not assessable, Fail, Pass, Remarkable, Excellent, Honors.

Exam review system: The exam review will be done individually with the student. When the provisional grades are published, the time and place where the review will be carried out will be indicated.

Bibliography

BIBLIOGRAPHY

Specific bibliography:

- Kumar V, Abbas A, Fausto N, Aster J. Robbins y Cotran. Patología Estructural y Funcional (10ª edició + students consult). Barcelona. Saunders-Elsevier. 2021.

- Kumar V. Abbas A, Aster J. "Robbins y Kumar Patología Humana". (11ª edició). Barcelona. Elsevier. 2024.

Consultation bibliography:

- Klatt E. Robbins y Cotran. Atlas de Anatomía Patológica. 4ª ed. Elsevier. 2022

- GJ Netto, I. Schrijver. Genomic Applications in Pathology. New York. Springer. 2016.

- Rubin R, Strayer D, Rubin E. Patología. Fundamentos clinicopatológicos en Medicina. 1 ed. Wolters Kluwer, 2016.

- Mohan H. Patologia + Resumen y preguntas de autoevaluacion. 6ª ed. Editorial Panamericana, 2021

- F.J. Pardo-Mindan. Mind Maps en Anatomía Patológica. Barcelona. Elsevier. 2010.

- Strachan T, Read AP. Human Molecular Genetics (5th ed). New York. Taylor & Francis Inc. 2018.

- Weinberg RA. The Biology of Cancer. (2nd ed.) New York. Taylor & Francis Inc. 2014.

- Connolly A, Finkbeiner W. Autopsy Pathology: A manual and Atlas: Expert consult . 3ª ed. Saunders. 2016

- Hooper, J, Williamson, A. Autopsy in the 21st Century. Best Practices and Future Directions. 1ª ed. Springer. 2018

Internet resources

https://accessmedicina-mhmedical-com.are.uab.cat/content.aspx dins d'aquest enllaç trobareu: Patología. PF Valencia Mayoral, J Ancer Rodriguez

http:/ www.acmcb.es/societats/anatomia

https://www.seap.es

http://www.telepatologia.es

https://webpath.med.utah.edu/

https://www.voxel-man.com/gallery/visible-human

https://www.le.ac.uk/pathology/teach/va/titlpag1.html

http://www.pathologylearning.org/trig/about

https://www.esp-pathology.org

https://unckidneycenter.org/kidneyhealthlibrary/

https://kidneypathology.com/

https://neuropathology-web.org/

These adresses allow you to contact many websites related to Pathology

Software

There is no specific software required for this subject.

Groups and Languages

Please note that this information is provisional until 30 November 2025. You can check it through this link. To consult the language you will need to enter the CODE of the subject.