

Degree	Type	Year
2502442 Medicine	OB	6

Contact

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Teachers

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Teaching groups languages

You can view this information at the [end](#) of this document.

Prerequisites

It is advisable for the student to have achieved basic skills in clinical pathophysiology and semiology, structural pathology, complementary examination techniques, medical imaging, clinical and microbiological laboratory, as well as principles of pharmacology and therapeutics of the different devices and systems humans.

It is recommended that the student has achieved basic skills in the digital field, molecular biology, biostatistics and epidemiology.

Sufficient knowledge of physiopathology on the psychological bases of health and disease states is desirable, as well as an adequate level of knowledge in interpersonal communication

Objectives and Contextualisation

This is a subject taught in the second semester of the fifth year of the Degree in Medicine. Like the other AIMs, it is a transversal subject that aims to develop basic skills for the professional activities and scientific thinking of medical graduates. It is intended to provide comprehensive training in medical knowledge, ensuring that the biological and pathophysiological bases of medicine and clinical disciplines are not considered isolated subjects without continuity.

During the course of the AIMS, students must develop basic transversal skills for professional activities and scientific thinking, including argumentation based on evidence, the ability to ask suitable questions, data analysis and interpretation, and the application of pathophysiological principles to understand diseases. Generic self-learning skills such as teamwork, oral and written communication, reading, and information research will also be developed, including the use of new information technologies and bioinformatics.

During the teaching period, students will solve problem cases, the content of which will vary each academic year. The work will be done in small groups with the collaboration of a tutor responsible for each case and tutors responsible for the various course subjects involved in the development of the case. The subject will be conducted in a problem-based learning format, combining tutoring sessions with independent student work.

In the presentation session for each case, the work's characteristics will be explained. Students will attend scheduled tutorials and consult all relevant sources to solve the clinical problem presented, which will be shared with the entire class in the final session to conclude the case.

In the Bioinformatics Module, the teaching will be mixed. It will begin with an introduction to the most commonly used tools, followed by guided and tutored case solving, then autonomous case solving, and finally focusing on a case to be worked on in small groups and presented in the final session (Congress).

The general training objectives of the subject are:

- Learn basic skills in medical practice.
- Acquire the scientific foundations of basic procedures in clinical medicine.
- Learn basic skills in using information resources and bioinformatics in medical research.
- Integrate knowledge and content from the core subjects of the fifth year and previous years.
- Apply this knowledge to real situations based on simulated clinical cases.
- Develop syndromic and clinical diagnostic skills and therapeutic procedures.
- Develop generic self-learning skills, including the organization of independent work, teamwork, information search, new information technologies, and critical analysis of information.
- Acquire the ability to prepare and present biomedical work.
- Communicate clearly, both orally and in writing, with other professionals and the media.
- Demonstrate an understanding of the structure and function of the human body in disease across different life stages and genders, including a gender perspective.
- Understand the importance and limitations of scientific thinking in studying, preventing, and managing disease.
- Comprehend the manifestations of disease on the human body's structure and function.
- Understand the basic statistical methodologies used in biomedical and clinical studies and use modern computational technology analysis tools.
- Demonstrate basic research skills and a critical, creative, and research-oriented perspective in professional activities.
- Develop a diagnostic approach and establish a reasoned action strategy, evaluating the results of anamnesis, physical examination, and subsequent complementary examinations.
- Teach and communicate learned knowledge and techniques to other professional groups.
- Listen carefully, obtain and synthesize relevant patient information, and understand its content.
- Establish good interpersonal communication to effectively and empathetically address patients, relatives, companions, doctors, and other healthcare professionals.
- Formulate hypotheses and critically assess information for problem-solving following the scientific method.
- Recommend the most appropriate therapy for prevalent acute and chronic conditions and terminally ill patients.
- Indicate basic diagnostic techniques and procedures, analyzing and interpreting results to better specify the nature of problems.
- Maintain and update professional competence, emphasizing independent learning of new knowledge and techniques and motivation for quality.
- Obtain and prepare a clinical history containing all relevant information, structured and patient-focused, considering age, sex, cultural, social, ethnic, and gender factors.
- Organize and plan workload and time in professional activities appropriately.

- Conduct a comprehensive and systematic physical examination, including mental assessment, appropriate to the patient's age and sex.
- Recognize professional values such as excellence, altruism, duty, compassion, empathy, honesty, integrity, and commitment to scientific methods.
- Understand the role in multi-professional teams, assuming leadership when appropriate, for healthcare provision and health promotion interventions.
- Recognize the essential elements of the medical profession, including ethical principles, legal responsibilities, and patient-centered professional practice, as a result of an evolutionary, scientific, and sociocultural process.
- Acknowledge personal limitations and accept the opinions of other healthcare colleagues to modify initial opinions if necessary.
- Understand and apply the role of a doctor as a manager of public resources.
- Write clinical histories, medical reports, and other medical records comprehensibly for third parties.
- Use information and communication technologies in professional activities.
- Critically evaluate and use clinical and biomedical information sources to obtain, organize, interpret, and communicate scientific and health information.
- Effectively use electronic resources and bioinformatics databases to obtain information. Identify the usefulness and potential of information technologies and bioinformatics resources in various knowledge areas and apply them appropriately to draw relevant conclusions.

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 basic research skills.
- Demonstrate understanding of basic statistical methodologies used in biomedical and clinical studies and use the analytic tools of modern computational technology.
- Demonstrate understanding of the importance and the limitations of scientific thought to the study, prevention and management of diseases.
- Demonstrate understanding of the manifestations of the illness in the structure and function of the human body.
- Demonstrate understanding of the structure and function of the human organism in illness, at different stages in life and in both sexes.
- Demonstrate, in professional activity, a perspective that is critical, creative and research-oriented.
- Empathise and establish efficient interpersonal communication with patients, family-members, accompanying persons, doctors and other healthcare professionals.
- Engage in professional practice with respect for patients' autonomy, beliefs and culture, and for other healthcare professionals, showing an aptitude for teamwork.
- Establish a diagnostic approach and a well thought-out strategy for action, taking account of the results of the anamnesis and the physical examination, and the results of the appropriate complementary tests carried out subsequently.
- Formulate hypotheses and compile and critically assess information for problem-solving, using the scientific method.
- Indicate the basic diagnosis techniques and procedures and analyse and interpret the results so as to better pinpoint the nature of the problems.
- Indicate the most suitable treatment for the most prevalent acute and chronic processes, and for the terminally ill.
- Listen carefully, obtain and synthesise relevant information on patients' problems, and understand this information.
- Maintain and sharpen one's professional competence, in particular by independently learning new material and techniques and by focusing on quality.
- Obtain and prepare a patient record that contains all important information and is structured and patient-centred, taking into account all age and gender groups and cultural, social and ethnic factors.
- Organise and plan time and workload in professional activity.

- Perform a general and a system-by-system physical examination appropriate to the patient's age and sex, in complete and systematic way, and a mental evaluation.
- 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.
- Recognise the professional values of excellence, altruism, sense of duty, compassion, empathy, honesty, integrity and commitment to scientific methods.
- Recognise, understand and apply the doctor's role as a manager of public resources.
- Recognize one's role in multi-professional teams, assuming leadership where appropriate, both for healthcare provision and for promoting health.
- Use information and communication technologies in professional practice.
- Write patient records and other medical documents that can be understood by third parties.

Learning Outcomes

1. Accept other viewpoints (lecturers, colleagues, etc.) regarding the problem or topic at hand.
2. Acquire the principles and values of good medical practice, both in health and in illness.
3. Adopt values of solidarity and service to others, both when dealing with patients and with the general public.
4. Apply analytic tests in accordance with their cost efficiency.
5. Appraise patients' expectations in order to respect them and act appropriately.
6. Assess the efficiency of the main therapeutic interventions.
7. Assess the importance of every sign and symptom in the current illness.
8. Assess the need, indications, contraindications, chronology, risk, benefits and costs of each examination.
9. Assess the relationship between efficacy and risk in the main therapeutic interventions.
10. Assess the semiological value of laboratory tests used in the most common human pathologies.
11. Be self-critical and reflect on one's own learning.
12. Calculate the cost efficiency of analytic tests.
13. Communicate clearly, orally and in writing, with other professionals and the media.
14. Compare one's own opinions with those of colleagues and other healthcare professionals as a basis for teamwork.
15. Conduct the interview correctly to obtain significant clinical data.
16. Convey knowledge and techniques to professionals working in other fields.
17. Correctly apply statistical techniques to obtain benchmark values and compare them to the results of analytic tests on patients.
18. Correctly record the information obtained in interviews with patients.
19. Critically assess the results of complementary examinations, taking their limitations into account.
20. Demonstrate basic research skills.
21. Demonstrate, in professional activity, a perspective that is critical, creative and research-oriented.
22. Describe the elements that should be considered when determining the reasons for a consultation and those of the patient's therapeutic itinerary.
23. Describe the organisation, characteristics and performance of the Spanish health system.
24. Describe the person as a multidimensional being in which the interplay of biological, psychological, social, environmental and ethical factors determines and alters the states of health and disease and their manifestations.
25. Distinguish normality from pathological alterations on performing a physical examination.
26. Distinguish situations that require hospitalisation and those that require intensive care.
27. Establish a method for complementary examinations, in accordance with the standard process and the diagnostic expectations.
28. Establish a therapeutic action plan considering the needs of patients and their family and social environment, and involving all members of the healthcare team.
29. Explain ethical, legal and technical features and those of confidentiality related to patient documentation.
30. Explain the mechanisms by which illness affects the different systems of the human body at different stages in life and in both sexes.
31. Formulate hypotheses and compile and critically assess information for problem-solving, using the scientific method.

32. Gather meaningful psychosocial data.
33. Gather, choose and record important information patient supplied by patients and accompanying persons.
34. Identify patients' social and health needs.
35. Identify serious clinical situations.
36. Identify sources of information on analytic tests for patients and professionals and critically evaluate their content.
37. Identify symptoms of anxiety, depression, psychosis, toxics consumption, delirium and cognitive deterioration.
38. Identify the basic principles of legislation on health and the right to health.
39. Identify the most efficient analytic tests for prevention, diagnosis and control of treatment for the most common human pathologies.
40. Identify the physical, chemical, environmental, psychological, social and occupational and carcinogenic factors, and the factors associated with food habits and drug use, that determine the development of the disease.
41. Identify type, evolution and limitations in chronic diseases, their possible treatments and prevention of complications.
42. Indicate and interpret the basic techniques and procedures for laboratory diagnosis, diagnostic imaging and others.
43. Indicate suitable therapeutic interventions for the main health problems.
44. Inform on the results of analytic tests.
45. Interpret population parameters of individual risks appropriately.
46. Involve the family in patient healthcare.
47. Maintain and sharpen one's professional competence, in particular by independently learning new material and techniques and by focusing on quality.
48. Obtain, in an appropriate way, clinical samples needed for laboratory tests.
49. Order signs and symptoms to perform a differential syndromic diagnosis.
50. Organise and plan time and workload in professional activity.
51. Summarise and order information on the problems of the sick.
52. Use appropriate statistical techniques to study the semiological value of analytic tests.
53. Use biomedical databases.
54. Use information and communication technologies in professional practice.

Content

Depending on the number of groups into which the students are divided, different clinical cases are prepared (at least one case per group) based on the subjects and materials of Module 3 (human clinical training), which will be solved by each group:

MIC IV (neurology, endocrinology, infectious diseases)

Pediatrics

Psychiatry

Clinical Dermatology

In solving the cases, some of the subjects from Module 4 and Module 2 are involved (when the case requires it):

Subjects of Module 4. Diagnostic and therapeutic procedures Medical Microbiology and Parasitology

Clinical Radiology Structural and Molecular Pathology General Pharmacology Clinical Pharmacology Medical Immunology

Subjects of Module 2.

Social Medicine, Communication Skills, and Introduction to Research Preventive Medicine and Public Health
Legal Medicine and Toxicology

Bioinformatics Module.

Practical sessions in Bioinformatics applied to Medicine

DISTRIBUTIVE BLOCKS

Presentation and solution of various clinical pathology cases, to be defined for each group

Bioinformatics Module:

Guided sessions on the use of information techniques and resources and Bioinformatics tools. Resolution of clinical cases to be defined using the tools previously presented.

Activities and Methodology

Title	Hours	ECTS	Learning Outcomes
Type: Directed			
PROBLEM-BASED LEARNING (PBL)	25	1	1, 2, 17, 4, 3, 12, 13, 14, 20, 21, 22, 23, 24, 25, 26, 16, 28, 27, 29, 11, 31, 41, 40, 30, 38, 37, 36, 34, 39, 35, 46, 42, 43, 44, 45, 47, 48, 49, 50, 15, 32, 33, 18, 51, 53, 54, 52, 19, 10, 6, 8, 9, 7, 5
Type: Autonomous			
PERSONAL STUDY / READING ARTICLES / REPORTS OF INTEREST	94.25	3.77	

This Guide describes the framework, content, methodology, and general rules of the subject, in accordance with the current curriculum. The final organization of the subject regarding clinical cases, number and size of groups, schedule distribution, exam dates, specific evaluation criteria, and exam review will be determined by each of the Teaching Units (UDH). This information will be provided through their web pages and on the first day of class for each subject, by the professors responsible for the subject at the UDH.

For the current academic year, the professors designated by the Departments as responsible for the subject at the Faculty and UDH levels are:

Responsible Department(s): Multidepartmental

Faculty Responsibilities: Jaume Kulisevsky (jkulisevsky@santpau.cat)

UDH Responsibilities:

UD Vall d'Hebron: Osca Len (oscarmanuel.len@vallhebron.cat)

UD Germans Trias i Pujol: Carlos Rodrigo Gonzalo de Liria (crodrigo.germanstrias@gencat.cat)

UD Sant Pau: Jaume Kulisevsky Bojarski (jkulisevsky@santpau.cat)

UD Parc Taulí: Oriol Gasch Blasi (ogasch@tauli.cat)

Bioinformatics Module: Angel González Wong (Angel.Gonzalez@uab.cat)

TUTORS AND SESSIONS

Tutors: A case tutor for each of the subjects and/or topics in module 3 involved in the clinical cases (to be determined in each Teaching Unit), who will be responsible for the cases, presentation, closing, and specific tutoring.

Module 3: Human Clinical Training:

MIC IV (neurology, endocrinology, infectious diseases): number of cases to be defined

Pediatrics: number of cases to be defined

Psychiatry: number of cases to be defined

Clinical Dermatology: number of cases to be defined

A reference tutor for each subject in modules 4 and 2 involved in the cases, responsible for documentation, discussion, and tutoring of their subject in the cases as necessary.

Module 4. Diagnostic and Therapeutic Procedures Medical Microbiology and Parasitology

Clinical Radiology

Structural and Molecular Pathology

General Pharmacology, Clinical Pharmacology

Medical Immunology

Module 2. Social Medicine, Communication Skills, and Research Introduction Preventive Medicine and Public Health

Legal Medicine and Toxicology

TUTORS AND SESSIONS

Tutors: A case tutor for each of the subjects and/or topics in module 3 involved in the clinical cases, who will be responsible for the cases, presentation, closing, and specific tutoring.

Module 3: Human Clinical Training:

MIC IV (neurology, endocrinology, infectious diseases): number of cases to be defined

Pediatrics: number of cases to be defined

Psychiatry: number of cases to be defined

Clinical Dermatology: number of cases to be defined

A reference tutor for each subject in modules 4 and 2 involved in the cases, responsible for documentation, discussion, and tutoring of their subject in the cases as necessary.

Module 4. Diagnostic and Therapeutic Procedures Medical Microbiology and Parasitology

Clinical Radiology

Structural and Molecular Pathology

General Pharmacology, Clinical Pharmacology

Medical Immunology

Module 2. Social Medicine, Communication Skills, and Research Introduction Preventive Medicine and Public Health

Legal Medicine and Toxicology

Sessions: Total activity: 3 ECTS credits = 75 hours.

Autonomous activity (55%; 41.25 hours): Personal study, preparation of cases and presentations

Directed activity: 40%, 30 hours (5 cases; one case = 6 hours; in 4 sessions)

Evaluation: 5%, 3.75 hours

Bioinformatics Module:

Total activity: 2 ECTS credits = 50 hours.

Autonomous activity: Personal study, reading articles, work in computer labs, case preparation, and presentation preparation (52%; 26 hours)

Directed activity: Computer lab practices and congress attendance (44%, 22 hours)

Evaluation: Oral presentation and defense of the case resolution - Congress (4%, 2 hours)

Types of sessions

Sessions 1 and 4 (ABP type): Initial presentation and final solution of the 5 cases 10h (Initial and final sessions 5h+5h)

Sessions 2,3. (ABP type); 20 hours in two blocks of sessions:

Session 2 (ABP type); Documentation sessions; diagnostic and therapeutic procedures block and social medicine, communication skills, and research introduction: 10 h (2h per case; allows consecutive tutors)

Session 3 (ABP type); Documentation sessions; block 4 and 2. Problem-solving sessions, supervision of simulated cases prepared, and presentation preparation: 10h (2h per case; allows consecutive tutors)

All students must know and participate more or less directly in the solution of all cases. The knowledge acquired and the participation and presentation of solutions will be the basis of the course evaluation.

The registration group is divided into corresponding student workgroups for each case. In the presentation session (session 1), directed by the case tutor, the entire registration group attends, the case is presented, and the student workgroups for the case are assigned. These groups will directly participate in solving each case in the documentation and problem-solving sessions (sessions 2-3), directed by the tutors of each subject involved in the case. In these sessions, the rest of the students in the registration group also participate as listeners, so they also have direct access to the documentation and can attend the problem discussions of each case.

In the final case resolution session (session 4), directed by the case tutor, the student group presents the solution to the entire registration group, ensuring that all students have access to the discussion and final solution and can adequately acquire the essential knowledge for the final evaluation, which includes all cases.

Example of temporal distribution

Week 1. Presentation. ABP type; registration group.

Case tutor. Presentation of the case, objectives, methodology, reference tutors, sessions to follow.

Case 1 1h Case 2 1h Case 3 1h Case 4 1h Case 5 1h

Week 2. Documentation and problem-solving. ABP type scheduled in the registration group classroom. Registration group attends, the case workgroup works on the case.

Tutors diagnostic and therapeutic procedures block. Documentation, problem-solving, and specific subject tutoring of the case.

Case 1 2h (3x40')* Case 2 2h (3x40')* Case 3 2h (3x40')* Case 4 2h (3x40') Case 5 2h (3x40')*

- 2, 3, or 4 consecutive sessions can be scheduled, depending on the number of reference tutors suitable for each case (120' = 2x60', 3x40', 4x30')

Week 3. Problem-solving and presentation supervision. ABP type scheduled in the registration group classroom. Registration group attends, the case workgroup works on the case.

Tutors diagnostic and therapeutic procedures block and case tutor. Problem-solving and tutoring of the case presentation and solution

Case 1 2h (3x40')* Case 2 2h (3x40')* Case 3 2h (3x40')* Case 4 2h (3x40')* Case 5 2h (3x40')*

- 2, 3, or 4 consecutive sessions can be scheduled, depending on the number of reference tutors suitable for each case (120' = 2x60', 3x40', 4x30')

Week 4. Case presentation and solution. ABP type; registration group

Case tutor: Presentation of the case by the students, final diagnosis, and case closure. Evaluation of the case and presentation

Case 1 1h

Case 2 1h

Case 3 1h

Case 4 1h

Case 5 1h

Total case1: 6 h

Total case 2: 6 h

Total case 3: 6 h

Total case 4: 6 h

Total case 5: 6 h

Bioinformatics Module:

All sessions are mandatory.

Sessions 1 to 4 (ABP type): Introduction and use of basic bioinformatics tools and resources to be used (4x2h)

Session 5 (ABP type): Guided case resolution (2h)

Sessions 6-7 (ABP type): Supervised case resolution (2x2h)

Sessions 8-9 (ABP type): Group resolution (4-5 students) of the case to be presented in session 10 - Congress (2x2h)

Session 10 - Congress: Evaluated oral presentations of the case worked on in sessions 8-9 and autonomously / attendance at the presentations of the other cases (3x2h).

For all Bioinformatics sessions, the registration group is divided into corresponding student groups based on the size of the computer labs where the sessions will be held.

Exceptionally and according to the criteria of the responsible faculty, available resources, and the health situation at the various Teaching Units, part of the content corresponding to theoretical lessons, practicals, and seminars may be delivered in person or virtually.

Note: 15 minutes of one class will be reserved, within the established calendar of the center/degree, for students to complete the surveys for the evaluation of the teaching performance and the evaluation of the subject/module.

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

Continuous Assessment Activities

Title	Weighting	Hours	ECTS	Learning Outcomes
Assessments through practical cases and problem resolution (AIMV)	18% of the final mark	2	0.08	1, 2, 17, 4, 3, 12, 13, 14, 20, 21, 22, 24, 25, 26, 16, 28, 27, 11, 31, 40, 30, 37, 36, 34, 39, 35, 46, 42, 43, 44, 45, 47, 48, 49, 50, 15, 32, 33, 18, 51, 53, 54, 52, 19, 10, 6, 8, 9, 7, 5
Attendance and active participation (AIMV)	12% of the final mark	0	0	4, 14, 25, 26, 28, 11, 35, 48, 49, 15, 32, 53
Attendance and active participation (Bioinformatics)	12% of the final mark	0	0	4, 13, 14, 21, 11, 31
Congress / Presentation of works (Bioinformatics)	12% of the final mark	2	0.08	1, 2, 17, 13, 16, 11, 31, 40, 30, 45, 47, 51, 53, 54
Resolution of questionnaires (Bioinformatics)	16% of the final mark	0	0	20, 21, 31, 53, 54
Written evaluations through objectives tests (AIMV)	30% of the final mark	1.75	0.07	22, 23, 24, 28, 29, 11, 41, 40, 30, 38, 43, 49, 51, 19, 10, 6, 9, 7

Evaluation activities

Each student will participate in the presentation and resolution of a case. The main evaluation methodology of this subject is the continuous evaluation of the groups during the four sessions in which the subject is divided.

These seek that students, regardless of the specific content of each case, learn to integrate concepts, to ask and answer appropriately, to work in teams assuming what others in the same group are doing and getting used to correcting others, so that the end result is common and shared.

Presentation and discussion of the case

The presentation will be shared among all the students in the presentation group, on the scheduled day and in an equivalent presentation time. The case will be presented to the whole class (enrolment group), following a similar scheme and for a total approximate time of around 40 minutes

Continued evaluation

It is mandatory to attend the presentation sessions of all the cases and the final sessions in which the students present the resolution of each of the cases.

Attendance at the various meetings held with the tutor is mandatory. These can be done electronically (TEAMS).

Non-attendance prevents the student from being assessed. Participation in discussions and consulting tasks with other tutors will be valued

At the end, each group will have to prepare a document with the summary of the case, the differential diagnosis and the learnings they have had. These documents will be given to all students of the course.

As a guide, the final document must include the following points:

- Summary of the case
- Differential diagnosis
- Diagnostic hypothesis and plan to follow
- Complementary explorations
- Indicated diagnostic test and risk benefit
- diagnosis
- Treatment and prognosis

Non-attendance prevents the student from being assessed. Participation in discussions and consulting tasks with other tutors will be valued.

Bioinformatics module

Continuous assessment that will assess:

- Attendance (mandatory for all sessions), active participation in classes and the resolution of questionnaires to be completed in the different sessions using the Virtual Campus.
- The presentation, in the last session called Congress, of a PowerPoint with the analysis of the last of the cases worked on. The work will be done in small groups and will be in a free format. Students must use those tools, among those studied, that best fit the case.

With continued assessment, the student will be able to obtain a grade that can reach Excellent.

Students who wish to opt for Matricula will have to take a test-type exam of between 3 and 5 questions for each of the cases that have been worked on during the course by all groups and with 3-5 questions referring to the Bioinformatics Module regarding the tools worked. This test will be based on the documents prepared by each of the groups. The best grades will have an Honors Matriculation.

Students who have not passed the subject through continuous assessment will be classified as "NOT ASSESSABLE".

Although the assessment will follow a similar pattern, it can be adapted to the characteristics of each of the Teaching Units. An exam will be scheduled based on cases presented by students who have not passed the contents of the subject, with a format to be determined.

This subject does not provide the single assessment system.

Bibliography

Consult the specific bibliography of the teaching guides for the different fifth year subjects.
Introduction to Bioinformatics / Teresa K. Attwood, David J. Parry-Smith; translation: Fernando González Candelas. Madrid Prentice Hall, 2002.

software

At the beginning of the Bioinformatics module, the specific software will be provided.

Internet resources

<http://www.nih.gov/>

<http://www.ncbi.nlm.nih.gov/>

<http://www.ebi.ac.uk>

<http://omim.org>

<http://www.genome.gov/>

<http://www.uniprot.org/>

<http://www.rcsb.org/>

<https://www.genome.jp/kegg/>

Software

Specific software is not required.

Language list

Information on the teaching languages can be checked on the CONTENTS section of the guide.