

Degree programme	Type	Course
Microbiology	OB	3

Contact lecturer

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Teaching staff

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Group languages

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

Prerequisites

Although there is no official prerequisite, students are advised to review the concepts that refer to the microbial world, studied previously.

Objectives

In this subject, students are expected to:

- Recognize the most important groups of pathogenic microorganisms for humans.
- Identify the bases of the microbiological diagnosis of a human infectious disease.
- Interpret the results of an antibiogram.
- Recognize the relationships that are established between a pathogen and the human body.
- List the major syndromes of human infectious pathology.
- Describe and correctly report information regarding clinical microbiology and infectious diseases in humans from specialized sources.

Learning outcomes

- CM13 (Plan diagnostic and control strategies for infectious diseases from a global perspective and integrating clinical and epidemiological data to provide innovative responses to the challenges, needs

and demands of society.) Plan diagnostic and control strategies for infectious diseases from a global perspective and integrating clinical and epidemiological data to provide innovative responses to the challenges, needs and demands of society.

- CM14 (Integrate knowledge and skills in the field of microbiology applied to health, working individually and in groups, to prepare and present in writing or orally and publicly a scientific work either in English or in one's own language or others.) Integrate knowledge and skills in the field of microbiology applied to health, working individually and in groups, to prepare and present in writing or orally and publicly a scientific work either in English or in one's own language or others.
- KM19 (Identify the cellular and molecular relationships established between a microorganism or parasite and its host, including physiological and pathological mechanisms of defence and host response.) Identify the cellular and molecular relationships established between a microorganism or parasite and its host, including physiological and pathological mechanisms of defence and host response.
- KM20 (Describe the most important groups of infectious agents, their biological cycles, the molecular mechanisms of pathogenesis and toxicity and the epidemiology of the diseases they cause.) Describe the most important groups of infectious agents, their biological cycles, the molecular mechanisms of pathogenesis and toxicity and the epidemiology of the diseases they cause.
- KM21 (Indicate the main measures for the prevention and control of pathogenic microorganisms.) Indicate the main measures for the prevention and control of pathogenic microorganisms.
- SM19 (Use bibliography or internet tools, both in English and in one's own language or others, for the study of pathogenic microorganisms and their control.) Use bibliography or internet tools, both in English and in one's own language or others, for the study of pathogenic microorganisms and their control.
- SM20 (Apply appropriate methods for the identification, diagnosis and control of microbial agents and their genetic or metabolic components in clinical samples or food.) Apply appropriate methods for the identification, diagnosis and control of microbial agents and their genetic or metabolic components in clinical samples or food.
- SM21 (Relate the characteristics of pathogens and their mechanisms of virulence and pathogenicity with the type of infection, the pathology and the immune response that develops and with the mechanisms of action of vaccines and antimicrobial agents.) Relate the characteristics of pathogens and their mechanisms of virulence and pathogenicity with the type of infection, the pathology and the immune response that develops and with the mechanisms of action of vaccines and antimicrobial agents.

Contents

CONTENTS THEORETICAL CLASSES

Topic 1. General concepts.

Introduction. Areas of study of clinical microbiology. Groups of pathogenic microorganisms for humans. Host-parasitic relationships. Basic concepts about infectious diseases.

Topic 2. The laboratory of clinical microbiology.

Introduction. Objectives of the clinical microbiology laboratory. Diagnosis and sample pressure. Types of samples, collection and storage.

Topic 3. Urinary tract infections.

Introduction. Structure and function of the urinary tract. Factors that predispose the infection. Clinical manifestations. More frequent aetiological agents of uncomplicated cystitis: *Escherichia coli* and other gram-negative bacilli, *Staphylococcus saprophyticus* and other gram-positive bacteria. Laboratory Diagnostics. General rules for the treatment of urinary tract infections.

Topic 4. Infections of the genital system.

Introduction. Sexually transmitted diseases. Structure and function of the genital system. Factors that predispose to the infection. Clinical manifestations. Etiologic agents. *Neisseria gonorrhoeae* and *Chlamydia*

trachomatis: urethritis and cervicitis. *Candida albicans* and *Trichomonas vaginalis*: vulvovaginitis. Genital ulcers: *Treponema pallidum* and herpes simplex virus. *Papillomavirus*: genital warts and cancer. Laboratory Diagnostics. Treatment and prevention. Post-part endometritis: *Streptococcus agalactiae*.

Topic 5. Respiratory infections.

Introduction. Structure and function of the respiratory system. Factors that predispose to the infection. Clinical manifestations. *Rhinovirus*: common cold. *Streptococcus pyogenes*: Pharyngotonsillitis. *Corynebacterium diphtheriae*: diphtheria. Respiratory viruses and acute bronchitis. *Bordetella pertussis*. Pneumonia, etiologic agents. *Streptococcus pneumoniae*, *Legionella pneumophila*. Tuberculosis: *Mycobacterium tuberculosis*. Laboratory diagnosis of respiratory infections. Treatment and prevention.

Topic 6. Oral and sinus infections.

The ear, structure and function. Factors that predispose to the infection. Clinical manifestations. Etiologic agents. External otitis: *Pseudomonas*, *Aspergillus* and *Candida*. Agents of acute and chronic otitis media. Laboratory diagnostic. Treatment and prevention. Structure and function of the paranasal sinuses. Factors that predispose to the infection. Clinical manifestations. Most frequent etiological agents of sinusitis. Laboratory diagnostic. Treatment and prevention.

Topic 7. Eye infections.

The eye, structure and function. Clinical manifestations. Etiologic agents. *Chlamydia trachomatis*: the trachoma. *Neisseria gonorrhoeae*: purulent acute conjunctivitis. Viral infections. Infection of the ocular annexes. Laboratory diagnosis. Treatment and prevention.

Topic 8. Infections of the digestive tract.

Infection of the oral cavity. The mouth and teeth, structure and function. Factors that predispose to the infection. Clinical manifestations. Etiologic agents. *Streptococcus mutans*: dental caries. *Porphyromonas gingivalis*: periodontal disease. Structure and function of the gastrointestinal tract. Factors that predispose to the infection. Clinical manifestations Chronic gastritis and peptic ulcer: *Helicobacter pylori*. Intestinal infection Etiological agents of infectious gastroenteritis. Intestinal Helminthiasis. Toxicoinfection of food. Etiologic diagnosis. Treatment and prevention. Liver infection. Clinical manifestations. Etiologic agents. Laboratory diagnosis. Treatment and prevention.

Topic 9. Infections of the nervous system.

The nervous system, structure and function. Factors that predispose to the infection. Clinical manifestations. Etiologic agents of meningitis and encephalitis: *Neisseria meningitidis*, *Listeria monocytogenes*, enterovirus. Prions encephalopathies. Laboratory diagnosis. Treatment and prevention.

Topic 10. Infections of the skin and subcutaneous tissue.

Introduction. Skin and subcutaneous tissue, structure and function. Factors that predispose to the infection. Clinical manifestations Etiologic agents that cause skin and subcutaneous infections. Laboratory diagnosis. Treatment and prevention.

Topic 11. Infections of the circulatory system

Bacteremia, fungemia, viremia and parasitemia. Primary bacteremia. Secondary bacteremia. Sepsis and septic shock. Hemoculture. Causal agents of bacteremia. *Brucella*, *Francisella tularensis* and *Yersinia pestis*.

CONTENT SEMINARS

Preparation and presentation by students of subjects related to theory classes.

Learning activities and methodology

Title	Hours	ECTS	Learning outcomes
self-learning	14	0.56	CM13, CM14, KM19, SM19, SM21
Individual tutorials	4	0.16	CM13, KM19, KM20, KM21, SM20, SM21
Study	60	2.4	CM13, CM14, KM19, KM20, KM21, SM19, SM20, SM21
Seminars	10	0.4	CM13, CM14, KM19, KM20, KM21, SM19, SM20, SM21
Theoretical classes	35	1.4	CM13, KM19, KM20, KM21, SM20, SM21
Preparation of seminars	23	0.92	CM13, CM14, KM19, KM20, KM21, SM19, SM20, SM21

Theoretical classes. The student must acquire the scientific-technical knowledge of this subject attending these classes and complementing them with the personal study of the topics explained. The teaching of each subject will be based on a theoretical exposition and in a brief discussion of the same.

Seminars. In the seminars, students will develop topical issues in the world of clinical microbiology and infectious diseases working in cooperative or collaborative groups. They will have access to specialized scientific sources from which they will carry out an oral presentation of the selected topics.

Tutorials. Students can take individual tutorials with the teacher of the subject, whenever they need it, requesting a prior appointment.

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	Weight	Hours	ECTS	Learning outcomes
Seminars, oral presentation	20%	0	0	CM13, CM14, KM19, KM20, KM21, SM19, SM20, SM21
Theoretical classes, written exam	35%	2	0.08	CM13, KM19, KM20, KM21, SM20, SM21
Attendance at seminars and active participation	10%	0	0	CM13, CM14, KM19, KM20, SM21
Theoretical classes, written exam	35%	2	0.08	CM13, KM19, KM20, KM21, SM20, SM21

SCHEDULED ASSESSMENT ACTIVITIES

Theoretical classes. The evaluation of the theoretical content of the subject, corresponding to the knowledge acquired in the theoretical classes, will be carried out through two written exams (70% of the final grade). Each of these written exams must be passed with a grade equal to or higher than 5. To pass this part of the subject, both exams must be passed with a grade equal to or higher than 5.

Oral seminar presentation. The oral presentation (20% of the final grade) of a topic related to clinical microbiology and infectious diseases will be assessed. This activity is mandatory.

Attendance and active participation in seminars. Attendance at seminars and completion of exams related to all presentations will account for 10% of the final grade.

To pass the seminar component, a minimum grade of 5 must be obtained.

To pass the subject, a minimum grade of 5 must be obtained in the evaluation of theoretical content and a minimum grade of 5 in the seminar component. Students who do not achieve the minimum grade in the theoretical part may take a resit exam, which will have a maximum grade of 5. Students who do not achieve a minimum grade of 5 in the seminar component must take a resit exam consisting of an oral presentation of a scientific article and a written exam with questions related to all the seminars presented by their classmates, with a maximum grade of 5.

To be eligible for the resit, students must have been previously assessed in a set of activities that account for at least two-thirds of the total grade for the subject or module. Therefore, students will receive a grade of \"Not Assessable\" if the completed assessment activities account for less than 67% of the final grade.

Single Assessment

Students who opt for the single assessment must attend the seminar sessions in person and must pass them. Attendance is mandatory. The evaluation and weight of these seminars in the final grade will be the same as in continuous assessment.

The single assessment consists of a single exam covering the entire theoretical content of the subject. The grade obtained in this exam will represent 70% of the final grade for the subject. To pass this exam, a minimum grade of 5 must be obtained. The single assessment exam will take place on the same date scheduled for the final continuous assessment exam, and the same resit system will apply.

Use of Artificial Intelligence

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, or others at the discretion of the teaching staff. 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 evaluable activities and seminars 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.

Any irregularity committed in an assessment activity (academic fraud, plagiarism, or improper use of AI, unless such use is expressly authorized in the course guide) that may lead to a significant alteration of the grade will result in that assessment being graded with a 0.

If the course guide stipulates that obtaining a minimum grade in this assessment activity is an essential requirement to pass the course, or if multiple irregularities occur in the assessment activities of the same course, the final grade for the course will be 0.

Furthermore, disciplinary proceedings may be initiated against any student who commits any of these irregularities.

Bibliography

Online / print books

- Prats, Guillem, et al. Microbiología y parasitología médicas / director: Guillem Prats; coordinador general: Tomàs Pumarola; coordinadora científico-técnica: Beatriz Mirelis. 2.a edición, Editorial Médica Panamericana, 2023.
- Murray, Patrick R., et al. Medical Microbiology / Patrick R. Murray, Ken S. Rosenthal, Michael A. Pfaller. Ninth edition, Elsevier, 2021.
- Bennet, John E. et al. Mandell, Douglas, Bennett. Enfermedades infecciosas. Principios y práctica John E. Bennet, Raphael Dollin, Martin J. Blaser; colaboradores. 9a ed. Barcelona: Elsevier España, 2021. Print.

Websites

Sociedad Española de Enfermedades Infecciosas y Microbiología Clínica. Documentos Científicos.
<http://www.seimc.org>

European Center for Disease, Prevention and Control <http://ecdc.europa.eu/en/Pages/home.aspx>

European Food Safety Agency EFSA. <http://www.efsa.europa.eu/>

Centers for DiseaseControl and Prevention, USA. <http://www.cdc.gov/>

Organització Mundial de la Salut. <http://www.who.int/en/>

Instituto de Salud Carlos III Centro Nacional de Epidemiología. <http://www.isciii.es/>

Generalitat de Catalunya Salut. <http://www.gencat.cat>

Agència de Salut Pública de Barcelona. <http://www.aspb.cat/>

Software

None

Course groups and languages

The information provided is provisional until November 30. After this date, you will be able to consult the language of each group through this [link](#). To access the information, you will need to enter the course CODE

Type of teaching	Group	Language	Semester	Shift
(TE) Theory	73	Catalan	first semester	morning-mixed
(SEM) Seminars	731	Catalan	first semester	morning-mixed
(SEM) Seminars	732	Catalan	first semester	morning-mixed