



## IDENTIFYING DATA

### Clinical diagnosis and analysis

Subject	Clinical diagnosis and analysis			
Code	V02G030V01903			
Study programme	(*)Grao en Bioloxía			
Descriptors	ECTS Credits	Choose	Year	Quadmester
	6	Optional	4th	1st
Teaching language				
Department				
Coordinator	Fernández Briera, María Almudena			
Lecturers	Fernández Briera, María Almudena Fernández Rodríguez, Jonathan González Fernández, María África Iglesias Blanco, Raúl Longo González, Elisa Lopez Patiño, Marcos Antonio Pasantes Ludeña, Juan José			
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General description	Matter of theoretical character-practical designed to reach the basic skills of the principles of the analysis and clinical diagnostic. Said skills will reach by means of the assimilation of knowledges of analysis and diagnostic, experimental development of biochemical analysis, genetic, haematological, immunological, microbiological and parasitological and interpretation of results for the diagnostic of illnesses. The schedules of the matter can consult in <a href="http://bioloxia.uvigo.es/docs/docencia/horarios/hor_4grado_1sem1718.pdf">http://bioloxia.uvigo.es/docs/docencia/horarios/hor_4grado_1sem1718.pdf</a>			

## Competencies

Code	
A1	Students should prove understanding and knowledge in this study field that starts in the Secondary Education and with a level that, even though it is supported in advanced books, also includes some aspects that involve knowledge from the vanguard of the study field.
A2	Students should know how to apply their knowledge to their work or vocation in a professional way. They also should have the competences that are usually proved through the elaboration and defence of arguments and the resolution of problems within their study field.
A3	Students should prove ability for information-gathering and interpret important data (usually within their study field) to judge relevant social, scientific or ethical topics.
A4	Students should be able to communicate information, ideas, issues and solutions to all audiences (specialist and unskilled audience).
A5	Students should develop the necessary learning skills to undertake further studies with a high degree of autonomy
B2	Ability of reading and analyzing scientific papers and having critical assessment skills to understand data collection, deducing the main idea from the least relevant ones and basing on the corresponding conclusions.
B3	Acquisition of general knowledge about the basic subjects of biology, both at theory and experimental level, without dismissing a higher specialization in subjects that are oriented to a concrete professional area.
B4	Ability in handling experimental tools, both scientific and computer technology equipment that support the search for solutions to problems related to the basic knowledge of biology and with those of a concrete labour context.
B7	Collection of information about issues of biologic interest, analysis and emission of critical opinions and reason them including the reflection about social and/or ethical aspects related to the issue.
B10	Development of analytic and abstraction skills, the intuition and the logical and rigorous thought through the study of biology and its uses.
B11	Ability to communicate in detail and clearly: knowledge, methodology, ideas, issues and solutions to all audiences (not only qualified but unskilled in Biology).
B12	Ability to identify their own educational necessities in the biology field and in concrete labour areas and to organize their learning with a high grade of autonomy in any context.

C3	Identifying, analysing and characterizing biological samples, including those of human origin, and possible anomalies.
C4	Isolating, analysing and identifying biomolecules, viruses, cells, tissues and organs.
C5	Growing microorganisms, cells, tissues and organs.
C6	Assessing and interpreting metabolic activities.
C7	Manipulating and analysing genetic data and carrying out genetic counseling
C8	Assessing the functioning of physiological systems by the interpretation of parameters
C21	Processing and interpreting bioassays and biological diagnoses.
C22	Identifying, describing and using bioindicators.
C25	Gathering background information, develop experimental work and analysing data results
C29	Helping and evaluating scientific, technical, ethical, legal and socioeconomically aspects related to Biology.
C31	Knowing and handling technical and scientific apparatus.
C32	Knowing and handling basic or specific key concepts and terminology
C33	Understanding the social projection of Biology.
D1	Development of capacity of analysis and synthesis
D2	Acquisition of the organization and planning capacity for tasks and time
D3	Development of oral and writing communication abilities
D4	Acquisition of foreign language knowledge related to the study field
D5	Use of computer resources related to the study field
D6	Research and interpreting of information from different sources
D7	Resolution of issues and decision making in an effective way
D8	Development of the ability of independent learning
D9	Ability to work in collaboration or creating groups with an interdisciplinary character
D10	Development of the critical thinking
D11	Adquisition of an ethical agreement with the society and the profession
D14	Adquisition of abilities in the interpersonal relationships
D16	Acceptance of a quality commitment
D17	Development of the self-criticism ability

### Learning outcomes

Expected results from this subject	Training and Learning Results			
Know the basic principles of analysis and clinical diagnostic	A1	B2	C3	D1
	A2	B3	C4	D2
	A3	B7	C5	D4
	A4	B11	C6	D5
	A5	B12	C7	D6
			C31	D7
			C32	D8
				D9
				D14
				D16
				D17
Know the distinct types of human clinical samples, the methods of processed and the analytical proofs that employ in the laboratories of analysis and clinical diagnostic, as well as his methodological foundations	A1	B2	C3	D1
	A2	B3	C4	D2
	A3	B4	C5	D4
	A4	B7	C6	D5
	A5	B12	C7	D6
			C31	D7
			C32	D8
				D9
				D10
				D14
				D16
				D17
Purchase the necessary criteria to interpret properly the analytical proofs and can issue a reliable clinical diagnostic	A1	B2	C6	D1
	A2	B3	C8	D2
	A3	B7	C21	D4
	A4	B10	C22	D5
	A5	B12	C25	D6
			C31	D7
			C32	D8
				D9
				D10
				D14
				D16
				D17

Know and apply the legislation that regulates the *bioseguridad and the guarantee of quality in the laboratories of analysis and the clinical diagnostic	A1	B2	C29	D2
	A3	B3	C32	D5
	A5	B7	C33	D6
		B12		D8
				D10
Apply the knowledge of analysis and clinical diagnostic to isolate, identify, handle and analyse samples of biological origin, including virus, as well as to characterise his cellular and molecular constituents				D11
				D16
	A2	B2	C3	D1
	A3	B3	C4	D2
	A5	B4	C5	D4
		B7	C6	D6
		B10	C7	D7
		B12	C8	D8
			C22	D9
			C25	D10
			C31	D11
			C32	D14
				D16
				D17
Manipulate and analyse the genetic material and carry out genetic advice	A2	B2	C7	D1
	A3	B3	C29	D2
	A5	B4	C31	D3
		B7	C32	D4
		B11		D5
		B12		D6
				D7
				D8
				D9
				D10
				D11
				D16
Analyse and interpret the operation of the human being and his possible alterations	A2	B2	C3	D1
	A3	B3	C4	D2
	A5	B4	C5	D3
		B7	C6	D4
		B10	C8	D5
		B12	C21	D7
			C22	D8
			C31	D9
			C32	D10
				D11
				D16
				D17
Obtain information, develop experiments and interpret results	A2	B2	C3	D1
	A3	B4	C4	D2
	A5	B10	C5	D4
			C6	D5
			C7	D6
			C8	D7
			C21	D9
			C22	D10
			C25	D16
			C31	
Comprise the social projection of the analysis and clinical diagnostic and his repercussion in the professional exercise	A2	B3	C29	D1
	A3	B4	C33	D4
	A5	B7		D5
		B12		D6
				D8
				D9
				D11
				D14
				D16
				D17

Know and handle the concepts, terminology and scientific instrumentation-technical relative to the analysis and diagnostic	A2	B2	C32	D1
	A3	B3		D2
	A4	B4		D3
	A5	B11		D4
				D5
				D6
				D8

## Contents

### Topic

Subject 1. Basic principles of the clinical analysis and diagnostic: Metrology. Systems and specimens. Phases of the diagnostic.

Subject 2. Management and control of quality in the clinical laboratory. Selection and validation of methods.

Subject 3. Diagnostic value of clinical proofs. Values of reference and interpretation of results. Norms of security and legislation.

Subject 4. Basic elements of Clinical Biochemistry and Molecular Pathology. Semiologic value of the determination of biochemical magnitudes: analites and metabolism.

Subject 5. Clinical diagnosis of alterations of organs and systems. Signposts of diagnostic proofs and their interpretation.

Subject 6. Hematology: Headcounts and hematic indexes. Identification of blood cells.

Subject 7. Introduction to the human parasites and their diagnostic. Samples and diagnostic parasite forms. Coproparasitology. Diagnostic of hemoparasites.

Subject 8. Karyotypes in the clinical practice.

Subject 9. Basic elements of Clinical Microbiology. Isolation of pathogenic microorganisms from clinical samples. Etiologic diagnosis of infectious illnesses. Proofs of susceptibility.

Subject 10. Basic elements of Clinical Immunology. Principles of the diagnostic of immunological illnesses. Interpretation of results.

## Planning

	Class hours	Hours outside the classroom	Total hours
Master Session	8	16	24
Laboratory practises	47	47	94
Case studies / analysis of situations	3	12	15
Other	2	15	17

\*The information in the planning table is for guidance only and does not take into account the heterogeneity of the students.

## Methodologies

	Description
Master Session	Exhibition by part of the professor of the foundations and basic principles of the analysis and clinical diagnostic. In the development of the theoretical classes pretends that the student purchase a basic knowledge of the fundamental principles applied in a laboratory of clinical analyses: control of quality, diagnostics proofs, methodologies and interpretation of results.
Laboratory practises	The work in the laboratory is headed to to achieve competition and application in the realisation of the analytical proofs and interpretation of the results, with the aim to form to the student in the activities carried out in Clinical Analysis (biochemical, genetic, haematological, immunological, microbiological and parasitologic). Likewise, with the visit to the Service of Analysis of the University Hospital Complex of Vigo pretends that the student know in live the teams preanalytic robots, the autoanalyser of big capacity of work, the control of quality and the no robotic techniques in a hospital complex of big operative capacity.
Case studies / analysis of situations	The study of clinical cases pretends that the student developed his capacity to the interpretation of clinical analyses , resolve problems, contrast data, discussion, complete knowledges and realise diagnostic in base to the available data, training like this in the bases of the clinical diagnostic.

<b>Personalized attention</b>	
<b>Methodologies</b>	<b>Description</b>
Master Session	The master sessions will be participative. The personalised attention will run to charge of the responsible professors of each subject in the corresponding weekly hours of tutoring.
Laboratory practises	The responsible professors will provide personalized attention to each student during the realisation of the practices of laboratory and will give the necessary support for the understanding of the aims, methodology, concrete techniques to use and interpretation of results.
Case studies / analysis of situations	The autonomous work of the student will be supervised, and resolved the doubts or problems arisen in his realisation, by the responsible professors. All the queries and orientations will carry out in the tutoring hours of each professor.

<b>Assessment</b>	
Description	Qualification Training and Learning Results
OtherCONTINUOUS EVALUATION (40% of the final qualification):	100 A1 B2 C3 D1
The contents developed in masterclasses, laboratory sessions and practical cases will be evaluated by means of proofs type test and of short answer, as well as problem solving, study of clinical cases or report presentations.	A2 B3 C4 D2
SEMINARS (10% of the final qualification): Resolution and presentation of clinical cases, exhibition and discussion in the seminars.	A3 B4 C5 D3
FINAL PROOF (50% of the final qualification):	A4 B7 C6 D4
The fundamental contents of the matter will be evaluated, likewise, through a final written exam including multiple answer test questions, questions or exercises with short answers, questions of reasoning or resolution of problems and analysis of cases.	A5 B10 C7 D5
The student must obtain a qualification higher than 50% of the value to pass the course and that consider him the Continuous Evaluation and Seminars.	B11 C8 D6
The contribution of each one of the Subjects of the Program to the qualification (so much continuous Evaluation like final Proof) will be proportional to the educational load that represent inside the matter:	B12 C21 D7
Subjects 1, 2, 3 4 and 5...50% of the final note	C22 D8
Subject 6...10%	C25 D9
Subject 7...10%	C29 D10
Subject 8...10%	C31 D11
Subject 9...10%	C32 D14
Subject 10...10%	C33 D16
Dates of examinations:	D17
<a href="http://bioloxia.uvigo.es/docs/docencia/examenes/exames_grado_2017-18.pdf">http://bioloxia.uvigo.es/docs/docencia/examenes/exames_grado_2017-18.pdf</a>	

### Other comments on the Evaluation

The assistance to all the face-to-face activities is COMPULSORY to PASS the course (except justified absences).

To pass the course the final exam will be approved. Of not to surpass, the qualification of the student will be the obtained in the final integrative exam on 10 points. In the announcement of July the student suspense will have to realise only the Final Integrative exam, remaining the qualification obtained in the Continuous Evaluation.

### Sources of information

#### Basic Bibliography

R.A. McPHERSON & M.R. PINCUS eds., **HENRY'S CLINICAL DIAGNOSIS AND MANAGEMENT BY LABORATORY METHODS**, 22nd, SAUNDER ELSEVIER, 2011

J. WALLACH, **INTERPRETACIÓN CLÍNICA DE PRUEBAS DIAGNÓSTICAS**, 9ª, WOLTERS KLUWER, 2012

A. GONZÁLEZ- HERNÁNDEZ, **PRINCIPIOS DE BIOQUÍMICA CLÍNICA Y PATOLOGÍA MOLECULAR**, 1ª, ELSEVIER, 2010

S. HEIM, F. MITELMAN, **CANCER CYTOGENETICS**, 4rd, WILEY-BLACKWELL, 2015

<http://www.dpd.cdc.gov/dpdx/Default.htm>, **DPDx-CDC Parasitology Diagnostic Web Site**,

J.F. San MIGUEL, F.M. SÁNCHEZ-GUIJO, **HEMATOLOGÍA. MANUAL BÁSICO RAZONADO**, 4ª, ELSEVIER, 2009

W.C. Winn, S.D. Allen, W.M. Janda, E.W. Koneman, G.W. Procop, P.C. Schrenkenberger, G.L. Woods, **KONEMAN. DIAGNÓSTICO MICROBIOLÓGICO. TEXTO Y ATLAS EN COLOR**, 6ª, EDITORIAL MÉDICA PANAMERICANA, 2008

M. PEAKMAN, D. VERGANI, **INMUNOLOGÍA BÁSICA Y CLÍNICA**, 2ª, ELSEVIER, 2011

A.J. ABBAS, A.H. LICHTMAN, S. PILLAIR, **INMUNOLOGÍA CELULAR Y MOLECULAR.**, SAUNDER ELSEVIER, 2015

#### Complementary Bibliography

### Recommendations

**Subjects that are recommended to be taken simultaneously**

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Agri-food analysis and diagnostic/V02G030V01901

Environmental analysis and diagnosis/V02G030V01902

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**Subjects that it is recommended to have taken before**

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Biology: Basic laboratory techniques/V02G030V01203

Biochemistry I/V02G030V01301

Biochemistry II/V02G030V01401

Genetics I/V02G030V01404

Microbiology I/V02G030V01304

Animal physiology I/V02G030V01502

Animal physiology II/V02G030V01602

Genetics II/V02G030V01505

Immunology and parasitology/V02G030V01604

Microbiology II/V02G030V01605

Advanced techniques in biology/V02G030V01504

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