COURSE DESCRIPTION

COURSE DETAILS

Title (of the course): **APLICACIÓN DE METODOLOGÍAS BIOQUÍMICAS EN VETERINARIA**
Code: 101498
Degree/Master: **GRADO DE VETERINARIA** Year: 1
Name of the module to which it belongs: OPTATIVIDAD
Field: OPTATIVA
Character: OPTATIVA Duration: SECOND TERM
ECTS Credits: 3.0 Classroom hours: 30
Face-to-face classroom percentage: 40% Study hours: 45
Online platform: moodle

LECTURER INFORMATION

Name: PADILLA PEÑA, CARMEN ALICIA (Coordinador)
Department: BIOQUÍMICA Y BIOLOGÍA MOLECULAR
Area: BIOQUÍMICA Y BIOLOGÍA MOLECULAR
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PREREQUISITES AND RECOMMENDATIONS

Prerequisites established in the study plan

None

Recommendations

It is convenient that the student has previously studied Molecular, Animal and Plant Biology, and Physics and

INTENDED LEARNING OUTCOMES

CE2 To know the physical and chemical bases of biological processes and their applications to veterinary sciences.

CE3 Molecular bases of biological processes.

OBJECTIVES

Understand the fundamentals of basic Biochemistry methodologies, relevant for their multiple applications in Veterinary Medicine. The achievement of these objectives requires a design based on the practical realization in the laboratory by each student of the experimental blocks specified in the contents.

CONTENT

1. Theory contents

This subject will provide students with an understanding of the fundamentals and the management of basic biochemical methodologies relevant to their multiple applications in Veterinary Medicine. The achievement of these objectives requires a design based on the practical realization by each student of the experimental blocks that are specified below:
BLOCK I: Isolation and quantification of nucleic acids
- Genomic DNA isolation.

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- Quantification of nucleic acids.
BLOCK II: Amplification using the PCR technique, separation and visualization of nucleic acids.
- Amplification using the PCR technique.
- Separation of nucleic acid by electrophoresis in agarose gel.
- Visualization of nucleic acids with gel-red and UV light.
BLOCK III: Coupled enzymatic assays for the determination of activities and metabolites
BLOCK IV: Separation, visualization and quantitative analysis of proteins by electrophoresis.
BLOCK V: Identification of proteins / antigens by immunochemical assays.
- Western blotting.
- ELISA
BLOCK VI: Immobilization of enzymes in alginate.

2. Practical contents

The subject "Application of Biochemical Methodologies in Veterinary Medicine" will provide students with an understanding of the fundamentals and the management of basic biochemical methodologies relevant to their multiple applications in Veterinary Medicine. The achievement of these objectives requires a design based on the practical realization by each student of the experimental blocks that are specified below:
BLOCK I: Isolation, quantification, separation and visualization of nucleic acids:
- Isolation of genomic DNA from different meat products (hamburger, sausage, kebab ...).
- Quantification of nucleic acids.
BLOCK II: Amplification of nucleic acids using the PCR technique to identify the animal species from which the meat products used in the previous block come from.
- Separation by agarose gel electrophoresis of nucleic acids.
- Visualization of nucleic acids with gel-red and UV light.
BLOCK III: Enzymatic assays coupled for the determination of activities and metabolites:
-Determination of urea in serum and urine of different animals (horse, dog, cow ...).
-Determination of glucose in serum from different animals (horse, dog, cow ...).
-Determination of alkaline phostatase in animal serum (horse, dog, cow ...).
-Determination of creatinine in serum and urine of different animals (horse, dog, cow ...).
-Determination of blood hemoglobin (horse, dog, cow ...).
BLOCK IV: Separation, visualization and quantitative analysis of proteins by electrophoresis.
BLOCK V: Identification of proteins from different species by immunochemical assays:
- Enzootic bovine leukosis and / or blue tongue ELISA.
BLOCK VI: Construction of a bioreactor: immobilization of invertase in alginate (spherification technique)

METHODOLOGY

General clarifications on the methodology (optional)

A part of the practical classes will be taught by Raquel Requejo Aguilar and Daniel Lagal Ruiz.

Methodological adaptations for part-time students and students with disabilities and special educational needs

The particular considerations of students who study part-time will be taken into account.

Face-to-face activities

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Activity	Large group	Small group	Total
Assessment activities	2	-	2
Case study	1	-	1
Group work (cooperative)	-	1	1
Lab practice	-	20	20
Text analysis	3	-	3
Tutorials	2	1	3
Total hours:	***8***	***22***	***30***

Off-site activities

Activity	Total
Analysis	20
Information search	5
Reference search	5
Self-study	15
Total hours	***45***

WORK MATERIALS FOR STUDENTS

Case studies
Coursebook - *moodle*
Dossier - *moodle*
Placement booklet - *moodle*

EVALUATION

Intended learnig	Case Studies	Exams	Laboratory Practice	Placement reports
CE2	X	X	X	X
CE3	X	X	X	X
Total (100%)	***10%***	***30%***	***30%***	***30%***
Minimum grade	***4***	***4***	***10***	***4***

(*)Minimum grade necessary to pass the course

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Method of assessment of attendance:

Al ser una asignatura practica, la asistencia es obligatoria.

General clarifications on instruments for evaluation:

In each of the instruments selected for evaluation, you must obtain the minimum qualification indicated in the table.

Clarifications on the methodology for part-time students and students with disabilities and special educational needs:

During the realization of practical activities will work on the skill: basic management of laboratory instruments and preparation of solutions.
The particular considerations of the students who study part-time will be taken into account.

Qualifying criteria for obtaining honors:

Según los criterios del articulo 30.3 del Reglamento de Regimen Academico.

BIBLIOGRAPHY

1. Basic Bibliography

- Devlin, T.M. (2004). Bioquímica, Libro de Texto con Aplicaciones Clínicas. (4ª Ed), Editorial Reverté, Barcelona.
- Nelson, D.L. y Cox, M.M. (2017). Lehninger. Principles of Biochemistry. (7th Ed), WH Freeman, New York.
- Stryer, L., Berg, J.M., Tymoczko, J.L. (2003). Bioquímica. (5ª Ed), Editorial Reverté, Barcelona.
- Berg, J.M., Tymoczko, J.L., Stryer, L. (2007). Bioquímica. (6ª Ed), Editorial Reverté, Barcelona.
- Voet, D., Voet, J.G., Pratt, C.W. (2007). Fundamentos de Bioquímica. La vida a nivel molecular. (2ª Ed), Editorial Médica Panamericana, Madrid.

2. Further reading

- Lodish, H, A Berk, ChA Kaiser, M Krieger, H Ploegh, A Amon and MP Scott,. (2013). Molecular Cell Biology, (7th Ed), WH Freeman, New York.
- Watson, J.D., TA Baker, SP Bell, A Gann, M Levine y R Losick. (2005). Biología Molecular del Gen. (5ª Ed), Editorial Médica Panamericana.

COORDINATION CRITERIA

Common evaluation criteria
Tasks deadlines
Tasks performance

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SCHEDULE

Period	Assessment activities	Case study	Group work (cooperative)	Lab practice	Text analysis	Tutorials
1# Week	0.0	0.0	0.0	3.0	1.0	0.0
2# Week	0.0	0.0	0.0	3.0	1.0	0.0
3# Week	0.0	1.0	0.0	3.0	0.0	0.0
4# Week	0.0	0.0	0.0	4.0	0.0	0.0
5# Week	0.0	0.0	0.0	4.0	0.0	0.0
6# Week	0.0	0.0	0.0	3.0	1.0	0.0
7# Week	0.0	0.0	1.0	0.0	0.0	3.0
8# Week	2.0	0.0	0.0	0.0	0.0	0.0
Total hours:	***2.0***	***1.0***	***1.0***	***20.0***	***3.0***	***3.0***

The methodological strategies and the evaluation system contemplated in this Course Description will be adapted according to the needs presented by students with disabilities and special educational needs in the cases that are required.