<table>
<thead>
<tr>
<th>MODULE</th>
<th>CONTENT</th>
<th>YEAR</th>
<th>TERM</th>
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<tbody>
<tr>
<td>FUNDAMENTAL BIOLOGY</td>
<td>Animal Physiology</td>
<td>2nd</td>
<td>3rd</td>
<td>6 ECTS</td>
<td>Required (Mandatory)</td>
</tr>
</tbody>
</table>

**LECTURER(S)**

Dra. Laura García Rejón: (Coordinator). Theory and Practices Part I

Dr. Mª Alba Martínez Burgos. Theory and Practices Part II

Dr. Cristina Sanchez González. Theory. Part II

Dr. Amalia Pérez Jiménez. Practices. Part I

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**DEGREE WITHIN WHICH THE SUBJECT IS TAUGHT**

Degree in Biotechnology

**PREREQUISITES and/or RECOMMENDATIONS (if necessary)**

It is recommended to have studied the subjects Cell Biology, Biochemistry and Macromolecular Biology

**BRIEF ACCOUNT OF THE SUBJECT PROGRAMME (ACCORDING TO THE DEGREE)**

GENERAL AND PARTICULAR ABILITIES

• CG4 - Know the basic principles of the structure and functionality of biological systems.
• CB3 - That students have the ability to gather and interpret relevant data (usually within their area of study) to make judgments that include a reflection on relevant issues of social, scientific or ethical nature
• CB5 - That the students have developed the necessary learning skills to undertake further studies with a high degree of autonomy
• CT1 - Analysis and synthesis capacity.
• CT2 - Ability to organize and plan.
• CT3 - Ability to apply knowledge in practice and solve problems.
• CT5 - Critical thinking.
• CT6 - Ethical commitment, with equal opportunities, with non-discrimination for reasons of sex, race or religion and with attention to diversity.
• CT7 - Sensitivity to environmental issues.
• CT8 - Ability to make decisions.
• CE10 - Ability to describe, analyze and modify phenomenologies and systems of interest in Biotechnology through the application of the principles of Animal Physiology.
• CE11 - Being able to collaborate in the design / proposal of biotechnological base actions in processes related to human health and / or the improvement of animal production and participate actively in the execution of said proposals.
• CE16 - Understand the general principles that regulate the metabolism and the mechanisms for its adaptation to changing environmental and physiological situations.

OBJECTIVES (EXPRESSED IN TERMS OF EXPECTED RESULTS OF THE TEACHING PROGRAMME)

• The basic concepts and procedures of Animal Physiology
• The principles that operate in the operation of animals, including humans, in relation to their environment
• The comparative aspects of the physiology of the different groups: manifestations of the unitary and diverse aspects of the physiology of the animals
• Structure / function relationships in animals at the subcellular, cellular, organ and system levels.
• The nature and importance of the mechanisms involved in the regulation / adaptation of the different functions in animals.
• Possible applications of the knowledge acquired in relation to various professional fields of biotechnology: health and human welfare, animal production, management and maintenance of biodiversity, research in this field, transmission of specific knowledge, etc.
**THEORETICAL SUBJECT:**

**UNIT 1. GENERAL INTRODUCTION TO ANIMAL PHYSIOLOGY**
- **TOPIC 1.** Basic and fundamental concepts of animal physiology. The animal functions. The control mechanisms.

**UNIT 2: FUNCTIONAL BASIS OF THE NERVOUS SYSTEM**
- **TOPIC 2.** Basic organization of the nervous system. Functional elements. The central and peripheral nervous system.

**UNIT 3: PERCEPTION OF THE INTERNAL AND EXTERNAL ENVIRONMENT: SENSORY MECHANISMS**
- **TOPIC 5.** Special senses. Physiology of hearing and balance. Physiology of taste and smell. Physiology of vision.

**UNIT 4: EFFECT SYSTEMS / ENGINES**
- **TOPIC 6.** Types of effectors. Physiology of the different types of muscle: skeletal, smooth, cardiac.

**UNIT 5: SENSORY-MOTOR INTEGRATION AND COMPLEX CEREBRAL FUNCTIONS**
- **TOPIC 7.** Somatic and vegetative motor integration. The different levels and centers of integration.

**UNIT 6: VEGETATIVE FUNCTIONS**
- **TOPIC 12.** Digestive function and basic principles of nutrition. Basic functions of nutrients. Mechanical and chemical digestion. Absorption of the products of digestion. Energy metabolism: metabolic rate and energy balances.

**UNIT 7: ENDOCRINE PHYSIOLOGY**
- **TOPIC 13.** General principles of hormonal action. Neuro-endocrine integration: hypothalamic hypophysis system and pineal gland.
- **TOPIC 14.** Endocrine regulation of growth and development. Hormones and growth factors. Thyroid hormones.
of calcium and phosphorus balance.

UNIT 8: REPRODUCTIVE FUNCTION
• TOPIC 16. Sexual reproduction. Male reproductive function. Female reproductive function

PRACTICAL SUBJECT:

Seminars / Workshops

Seminar 1 and Seminar 2. Study and exhibition of scientific publications related to the content of the subject. Preparation and resolution of problems and practical / clinical cases.

Laboratory practices.

Practice 1. Sensory and motor physiology. Study of sensory receptors and motor reflexes.

READING

FUNDAMENTAL BIBLIOGRAPHY

- CUNNINGHAM J.G. and KLEIN, B.G. Veterinary Physiology, Elsevier, 2013
- MARTÍN CUENCA E. Fundamentals of Physiology, Thomson, 2006
FURTHER READING

- MADRID J.A. and ROL DE LAMA A. (drs.) Chronobiology, Editec @ Red, 2006

RECOMMENDED INTERNET LINKS

- http://medicapanamericana.com/fisiologia
- http://arbl.cvmbs.colostate.edu/hbooks/pathphys/endocrine/gi/ Gastrointestinal hormones
- http://pb010.anes.ucla.edu/ Physiology of the nerve cell
- http://muscle.ucsd.edu/musintro/Jump.shtml Skeletal Muscle Physiology
- http://www.ursa.kcom.edu/Department/SlideSets/Summer/ContBreathing/PPContBreathing_files/frame.htm Breathing control
- http://nephron.com/htkw.html How the kidney works
- http://arbl.cvmbs.colostate.edu/hbooks/pathphys/endocrine/index.html Concepts of Endocrinology
- http://www.tiroides.net
- http://www.physiome.org.nz
- http://www.the-aps.org/ The American Physiological Society
- http://physoc.org/ The Physiological Society
- http://www.seccff.org/ Spanish Society of Physiological Sciences
- http://www.feps.org/ European Federation of Societies of Physiology

EVALUATION (EVALUATION INSTRUMENTS, EVALUATION CRITERIA AND PERCENTAGE ON THE FINAL QUALIFICATION, ETC.)

**Ordinary Call**

- Evaluation of the theoretical part of the subject (SE1): 70% of the overall score. It will include, in this section: the oral / written examination, the performance of several tests or controls, the attendance and the participation of the student in class (SE4).
- Evaluation of laboratory practices (SE2): 20% of the overall assessment. From this qualification, 60% will be assigned to the practical exam and 40% to the attendance, attitude and participation of the student in them.
- Evaluation of group work (seminars, clinical cases, etc.) (SE3, SE5, SE6): up to 10% of the overall...
assessment.
• To pass the subject, it will be necessary to obtain at least 50% of the maximum grade in each of the sections (1) and (2).

**Extraordinary call**

• In this call the student will necessarily be examined from the suspended part (s) (theoretical and/or practical).
• The student will have the option of presenting himself/herself to the part (s) that he/she deems appropriate (theoretical and/or practical)
• The student who presents himself to a part, will lose the previously obtained mark in that part.
• The student who does not attend a part, will keep the grade reached in the ordinary call in that part.
• Weighting: theoretical part 70%, practical part (includes seminars and group work) 30%.


"To qualify for the final single evaluation, the student, in the first two weeks of the subject, or in the two weeks following enrollment if it has occurred after the beginning of the subject, will request it, through the electronic procedure, to the Director of the Department, alleging and accrediting the reasons that assist him to be unable to follow the continuous evaluation system. In the case of degree subjects with teaching shared by several Departments, the student will request it from any of the Departments involved. The Director of the Department to which the application was addressed, after hearing the faculty responsible for the subject, will resolve the request within a period of 10 business days. Once said period has elapsed without the student having received an express written response, the request will be deemed estimated. In case of refusal, the student may file, within one month, appeal to the Rector, who may delegate the Dean or Director of the Center, as appropriate, exhausting the administrative way. Notwithstanding the foregoing, due to exceptional and unexpected causes (labor reasons, health status, disability, mobility programs, representation or any other analogous circumstance), the final single evaluation may be requested outside the aforementioned deadlines, under the same administrative procedure."

The final evaluation will consist of two tests, which will take place on the same day:

- Examination of the theoretical contents: 75% of the grade.
- Examination of practical contents: 25% of the grade.

**ADDITIONAL INFORMATION**

The dates of exams will be displayed on the Biotechnology Degree website (http://grados.ugr.es/biotecnologia/).