Course Guide 2018/2019

Human Physiology

Fisiología Humana

Bachelor in Dentistry

Mode: On Campus

Index

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Human Physiology

Module: **Biomedical Sciences.**

Subject: **Human Physiology.**

Level: **Basic.**

No. of Credits: **6 ECTS.**

Academic Session: **1st Course – 2nd Semester.**

Course Professors: **Fernando Cánovas García**.

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Office Hours: **Prior request for appointment by Virtual Campus.**

Professor coordinating the Module: **Sonia Sánchez Bautista.**

Brief Description

Biostatistics is the application of statistical analysis of data to biological and health sciences. All The subject of Human Physiology is part of the basic training for this Bachelor´s degree in Dentistry. This course will provide the student with a solid conceptual foundation which supports the teaching and learning of the specific material that will be studied throughout this Bachelor´s degree in Dentistry. The subject of Human Physiology aims to provide students with an understanding of the human body functions to better learn about all that is connected to Dental Pathology and subsequent treatments.

Prerequisites

None.

Objectives

1. To know the physiology of the nervous system.
2. To know blood physiology.
3. To know cardiovascular physiology.
4. To know respiratory physiology.
5. To know renal physiology.
6. To know digestive physiology.
7. To know endocrine physiology.

Competencies and Learning Outcomes

Basic competencies

MECES1: Students have demonstrated that they possess and understand the knowledge in an area of study that starts from the basis of general secondary education, and is usually found at a level that, although supported by advanced textbooks, also includes some aspects that imply knowledge coming from the forefront of their field of study.
MECES2: Students know how to apply their knowledge to their work or vocation in a professional manner and they possess the skills that are usually demonstrated through the elaboration and defense of arguments and through problem-solving within their area of study.
MECES3: 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 a social, scientific, or ethical nature.
MECES4: Students can transmit information, ideas, problems, and solutions to a specialized and non-specialized public.
MECES5: Students have developed the learning skills necessary to undertake later studies with a high degree of autonomy.

General competencies

G11: To understand the basic biomedical sciences on which Dentistry is based to ensure correct oral and dental care.
G12: To understand and recognize the structure and normal function of the stomatognathic apparatus at the molecular, cellular, tissue and organ levels in the different stages of life.

Interdisciplinary competencies

CT4: The ability to learn autonomously.

Specific competencies

CBM1: To understand the biomedical sciences on which Dentistry is based to ensure correct oral and dental care. Among these, appropriate subject matter should include:

- Embryology, anatomy, histology and physiology of the human body.
- Genetics, biochemistry, molecular and cellular biology.
- Microbiology and immunology.

CBM2: To know the morphology and function of the stomatognathic apparatus, including specific appropriate subject matters of embryology, anatomy, histology, and physiology.

Methodology

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Methodology	Hours	Hours of Classroom Work	Hours of Non-Classroom Work
Classroom based Classes	30	60 hours (40 %)	
Academic Tutorials	6		
Practicums	15		
Seminars	6		
Classroom Evaluations	3		
Personal Study	63		90 hours (60 %)
On-line Tutorials	9		
Resolution of Exercises and Practical Cases	9		
Project Completion and Oral Presentations	9		
TOTAL	150	60	90

Syllabus

Theoretical instructional program

1. Introduction. Physiology. Homeostasis.
2. The cell membrane. Transport mechanisms. Diffusion. Osmosis.
3. Cellular potentials. Resting potentials. Action potential. Ionic bases.
4. Synapses. Types. Synaptic potentials. Motor plate.
5. Muscle. Physiological bases of muscle contractions. Excitation-contraction coupling. Types of contraction.
6. Autonomic nervous system. Sympathetic nervous system. Parasympathetic nervous system. Functions. Physiology of the nervous system.
7. General organization of the nervous system.
8. Sensory systems. Energy transducers. Types of receptors. Receptive fields. Information coding.
9. Painful sensations. Receptor stimulation. Control of pain sensitivity. Neurotransmitters.
10. Chemical senses. Taste and smell.
11. Motor systems. Medullary and encephalic-trunk mechanisms. Cerebellum. Ganglia of the base. Cerebral cortex.
12. Blood circulation. Blood vessels. Functions. Microcirculation.
13. The heart. Myocardial syncytium. Electrical activity. Electrocardiogram.
14. Cardiodynamics. Cardiac cycle. Cardiac output.
15. Regulation of blood pressure. Nervous mechanisms. Hormonal mechanisms. Renal mechanisms.
16. Breathing mechanism. Alveolar ventilation. Diffusion of gases. Transport of gases.
17. Breathing control. Chemical control. Nervous control.

18. Urine formation. Clearance. Filtration.
19. Tubular mechanisms. Resorption. Secretion. Urine concentration.
20. Control of renal function. Sympathetic nervous system. Renin-angiotensin system. Antidiuretic hormone. Renal autacoids.
21. Water balance.
22. Sodium balance and extracellular volume.
23. Potassium balance.
24. Regulation of the acid-base balance.
25. Composition. Plasma. Blood cells.
26. Cellular elements. Erythrocytes. Blood types. Leukocytes. Platelets.
27. Hemostasis. Coagulation. Functional tests. Endocrine physiology.
28. Introduction. General concepts. Regulation. The hypothalamic-pituitary axis.
29. Endocrinology of growth. Adenohypophysis. Thyroid. Adrenal cortex.
30. Endocrinology of metabolism. Endocrine pancreas. Thyroid. Adrenal cortex.
31. Hydroelectrolytic endocrinology. Hypophysis. Adrenal cortex. Vitamin D. Parathyroid.
32. Sexual endocrinology. Sexual differentiation. Reproduction. Digestive and oral human physiology.
33. Gastrointestinal motility. Chewing. Swallowing. Gastric motility. Intestinal motility. Defecation.
34. Secretory functions of the digestive tract. Gastric secretion. Pancreatic secretion. Biliary secretion. Intestinal secretion.
35. Digestion and absorption. Carbohydrates. Fats. Proteins.
36. Overview of oral physiology.
37. Salivation. Physiology of the salivary glands.

Practical instructional program

- Practicum 1. Determining blood group.
- Practicum 2. Electrocardiography.
- Practicum 3. Blood pressure.
- Practicum 4. Spirometry.
- Practicum 5. Digestion I.
- Practicum 6. Digestion II.
- Practicum 7. Taste and smell.
- Practicum 8. Neurological exploration.
- Practicum 9. Blood glucose curve.
- Practicum 10. Physiological bases of CPR.

Relationship to Other Courses of the Study Plan

Human Anatomy and Embryology, Oral Anatomy. Biology. Dentistry and Sports.

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Grading System

For the June/September Sessions:

1. **Theoretical exams (70%):** Exams (or evaluative tests) will be carried out with theoretical-practical questions and resolution of assumptions that include the contents of the material studied.

2. **Practical exams (20%):** The practicums and/or seminars will be evaluated through different grading systems (practical exercises, completion and exhibition of projects, clinical cases, etc.…) that include the practical content worked on.

3. **Academic tutorials (10%):** The student's participation will be evaluated though different means such as forums, chats, videoconferences, self-evaluations, activities proposed by the professor, and/or debates.

The student shall pass the subject when the weighted average is equal to or greater than 5 points and all the parts that make up the grading system have been passed, with an overall weight equal to or greater than 20%.

If the student has less than 5 in any of the parts with a weight equal to or greater than 20%, the subject will be suspended, and the student must retake the part(s) in the next session within the same academic year. The suspended part(s) in official sessions (February/June) will be saved for successive sessions that are held in the same academic year.

In the event that the subject is not passed in the September session, the passed parts will not count for successive academic years.

The grading system (RD 1.125/2003. of September 5) shall be the following:

0-4.9 Suspended (SS)

5.0-6.9 Passed (AP)

7.0-8.9 Excellent (NT)

9.0-10 Outstanding (SB)

Honorable mention may be granted to students who have earned a grade equal to or greater than 9.0. This number may not exceed 5% of the total number of students enrolled in a subject in the corresponding academic year, unless the number of students enrolled is less than 20, in which case only a single honorable mention may be granted.

Bibliography and Reference Sources

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Related Websites

- Electronic resources, activities and exercises from the book by Tortora and Derrickson. Principles of Anatomy and Physiology, from the *Editorial Médica Panamericana*: http://www.medicapanamericana.com/tortora/home_student.asp
- Electronic resources, study guide, activities and exercises from the book by Silverthorn. Human Physiology, from the *Editorial Médica Panamericana*: http://www.medicapanamericana.com/fisiologia/silverthorn/home.asp

Study Recommendations

Students will have all the necessary material for the subject made available to them on the e-learning platform. This material will be made available prior to the start of the topics of the course so

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that students may review the material before being taught in class, being able to complete them in the class.

To get the most out of the practicums, it is essential that students come prepared with the appropriate work material for each one as indicated by the professor in class.

Students will be able to access their e-mails in order to make the necessary consultations to the teaching staff. If necessary, forums for discussion or for asking questions will be enabled on the e-learning platform.

It is recommended that students review contents taught in lectures and in practicums on a daily basis given the incremental nature of the subject.

Teaching Materials

Texts to be worked on and the documentation provided throughout the class will be made visible through the Virtual Campus. Therefore, students can access multiple documents in electronic format. These material and resources include the following:

- Under the Resources tab the student can find the following documents:
  - Academic Guide of the Subject.
  - Recommended Bibliography.
  - Program of the Subject.
  - Folder with Support Materials.
    - Subfolder with the slides the professor will use in each of the theoretic presentations.
    - Subfolder with supporting documents.
- Under the Announcement tab, news and important dates will be published, as well as students' exam grades.
- Under the Assignments tab, students will be offered different activities.
- Under the Messages tab, students are able to personally contact their professor to provide suggestions, ask questions, and make comments as appropriate.

The student should come to practicums with the appropriate materials and clothing, which will be indicated by the head professor of the practicums.

Tutorials

Brief Description

In academic tutorials, the focus will be to work on Decree No. 359/2009, of October 30th, which establishes and regulates the educational response to the diversity of students in the Autonomous Community of the Region of Murcia.
The activities that are carried out in the Academic Tutorials on this subject are:

- Personal orientation on the contents of the subject and the grading systems.

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- Consolidation of knowledge, abilities, skills and attitudes of group work, and oral and written communication.
- Planning and promoting student learning through the provision of bibliographic and documentary sources.
- Advice on how to approach the activities of the practical seminars.

The University also has a Special Body of Tutors that conducts personal tutoring with students enrolled in the degree. The personal tutor accompanies the students throughout the university phase. You can check the following link:

http://www.ucam.edu/servicios/tutorias/preguntas-frecuentes/que-es-tutoria

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