COURSE DATA

DATA SUBJECT

Code: 43087
Name: Cardiovascular and metabolic differences between men and women
Cycle: Master's Degree
ECTS Credits: 4
Academic year: 2025-26

STUDY (S)

Degree	Center	Acad. year	Period
2141 - Master's Degree in Physiology	Facultat de Medicina i Odontologia	1	Second quarter

SUBJECT-MATTER

Degree	Subject-matter	Character
2141 - Master's Degree in Physiology	Optional subject	ELECTIVES

COORDINATION

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VIÑA RIBES JOSE

SUMMARY

In this subject we will study the influence of gender on the various physiological systems, especially on the cardiovascular system. Gender differences will also be emphasized in special situations such as aging or physical exercise.

PREVIOUS KNOWLEDGE

RELATIONSHIP TO OTHER SUBJECTS OF THE SAME DEGREE

There are no specified enrollment restrictions with other subjects of the curriculum.

OTHER REQUIREMENTS

No se han especificado restricciones de matrícula con otras asignaturas del plan de estudios.

COMPETENCES / LEARNING OUTCOMES

2141 - Master's Degree in Physiology

Be able to integrate knowledge and deal with the complexity of forming judgements based on incomplete

or limited information including reflections on the social and ethical responsibilities linked to the application of knowledge and judgements.

Describe the main functional differences between men and women, as well as the specific mechanisms of disease production, the basis of therapeutics, and the means for maintaining and preventing health.

Describe the pathophysiological modifications of the functioning of the neural pathways associated with Alzheimer's disease and apply intervention strategies aimed at its treatment.

Have a proactive attitude towards possible changes that may occur in their professional and/or investigative work.

Have the learning skills needed to continue studying in a largely self-directed or independent manner.

Know how to apply knowledge and problem-solving abilities in new or unfamiliar environments within broader (or multidisciplinary) contexts related to the field of study.

Know how to communicate conclusions and the knowledge and rationale behind them to both specialised and non-specialised audiences clearly and unambiguously.

Know how to write and prepare presentations to present and defend them later.

Possess and understand knowledge that provides a foundation or opportunity to develop and/or apply original ideas often in a research context.

Recognize the importance of oxidative stress in the fetal-neonatal transition and describe the action protocols established in the main pathologies of the perinatal period.

Search, order, analyze and synthesize scientific information (databases, scientific articles, bibliographic repertoires), selecting the pertinent to focus current knowledge on a topic of scientific interest in Physiology.

To acquire a critical attitude that allows you to make reasoned judgments and defend them with rigor and tolerance.

To prepare a clear and concise memory of the results of your work and the conclusions obtained.

Understand and differentiate the physiological, pathophysiological and therapeutic aspects in the cardiovascular system and in the cerebral circulation.

Use different presentation formats (oral, written, slide presentations, boards, etc.) to communicate knowledge, proposals and positions.

Valorar la necesidad de completar su formación científica, en lenguas, en informática, asistiendo a conferencias o cursos y/o realizando actividades complementarias, autoevaluando la aportación que la realización de estas actividades supone para su formación integral.

DESCRIPTION OF CONTENTS

1. Introduction to gender differences in Physiology
A detailed summary of the main human functions and the differences between the two sexes.

2. Sex differences and aging
Regulation of longevity-related gene expression.
Why do women live longer than men?
Estrogens and phytoestrogens induce the expression of longevity genes.

3. Sex differences in the cardiovascular system
Estrogens and atherosclerosis: A genomic approach.
Gender differences in vascular reactivity.
Regulation of vascular tone and gonadal function.
Sex hormone receptors and cardiovascular function.

4. Other physiological sex differences
Physiology and pathophysiology of the female reproductive system.
Gender differences in metabolism and nutrition.
Gender differences in the physiology and pathophysiology of the central nervous system.
Genetic factors of gender and risk of osteoporosis.

WORKLOAD

PRESENCIAL ACTIVITIES

Activity	Hours
Tutorials	3,00
Theory	24,00
Total hours	**27,00**

NON PRESENCIAL ACTIVITIES

Activity	Hours
Attendance at other activities	2,00
Individual or group project	20,00
Independent study and work	35,00
Preparation of lessons	6,00
Resolution of case studies	10,00
Total hours	**73,00**

TEACHING METHODOLOGY

- Theoretical classes of participative master lesson.
- Conferences of experts in the subjects.
- Debate and guided discussion on the work carried out.
- Face-to-face and electronic tutorials with teachers.

EVALUATION

Evaluation system:

- Written exam consisting of questions with short answer: evaluation up to 10 points.

Minimum passing grade: 5 points.

REFERENCES

- Blair ML (2007) Sex-based differences in physiology: what should we teach in the medical curriculum? Adv Physiol Educ 31: 2325.

- Legato MJ, ed. (2004) Principles of gender-specific medicine. Elsevier Academic Press, New York.

- Miller V, Hay M (2004) Principles of sex-based differences in physiology. En: Advances in Molecular and Cell Biology, vol. 34. Elsevier Academic Press, New York.

- Mechanistic Pathways of Sex Differences in Cardiovascular Disease. Regitz-Zagrosek V, Kararigas G. Physiol Rev. 2017; 97(1): 1-37. doi: 10.1152/physrev.00021.2015. PMID: 27807199.

- Cardiovascular Disease in Women: Clinical Perspectives. Garcia M, Mulvagh SL, Merz CN, Buring JE, Manson JE. Circ Res. 2016; 118(8): 1273-93. doi: 10.1161/CIRCRESAHA.116.307547. PMID: 27081110; PMCID: PMC4834856.

- Sex differences in epigenetics mechanisms of cardiovascular disease. Novella S, Paes AB, Hermenegildo C. 2021. In: Epigenetics in Cardiovascular Disease (Vol. 24, 1st ed. pp. 213-234). Y. Devaux & E. Robinson (Ed.). Elsevier.

- Kublickiene K & Luksha L (2008) Gender and the endothelium. Pharmacol Rep. 60:49-60.

- Torgrimson BN, Minson CT (2005) Sex and gender: what is the difference? J Appl Physiol 99:785787.

- Miller VM (2010) Sex-based differences in vascular function. Women's Health 6:737752.