



## Syllabus

### Subject

<b>Subject / Group</b>	11259 - Biomembranes and Lipids. Nutrition-related Fundamentals. / 1
<b>Degree</b>	Master's Degree in Nutrigenomics and Personalized Nutrition
<b>Credits</b>	3
<b>Period</b>	2nd semester
<b>Language of instruction</b>	Spanish

### Professors

Lecturers	Office hours for students					
	Starting time	Finishing time	Day	Start date	End date	Office / Building
Mariona Palou March <a href="mailto:mariona.palou@uib.cat">mariona.palou@uib.cat</a>						You need to book a date with the professor in order to attend a tutoring session.

### Context

Francisca Barceló Mairata (PhD in Biochemistry, University of Barcelona, 1979) is a member of the UIB research Group of Clinical and Translational Research. Her teaching experience has focused on membrane biochemistry, bioenergetics and instrumental techniques in Biology. Part of her research experience has focused on the study of membrane structure and molecular interactions and cell signaling.

The aim of the course is to provide a general overview about biomembranes and lipids focusing the interest in the field of nutrition. The course will focus on three main points: (1) to study the structure, dynamic and function of the cell membrane for a comprehensive understanding of its vital role, (2) to examine functional aspects of the cell membrane and lipids related to metabolic disorders and other diseases and (3) to analyze research methodologies applied in the field of lipidomics and biomembranes.

The course will help you to understand specific subjects of the Master.

### Requirements

#### Recommended

In order to achieve the objectives of the course, students would have basic knowledge of the different disciplines of Life Sciences.

### Skills



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### Specific

- \* 1- To provide you with a conceptual framework for understanding the cell membrane as a supramolecular dynamic system. 2- To analyse the role of bioactive lipids as signaling and regulatory molecules in cell functions. 3- To familiarise with methodological aspects in the research field of biomembranes and lipidomics. .

### Generic

- \* 1- Capacity to prepare a report and give an oral presentation at an academic level. 2- Ability to develop their work in English (International scientific language). 3- Knowing the capabilities and potential of ICT (information and communication technologies) in the area of the discipline. 4- Capacity to analyse and evaluate experimental data and related scientific information .

### Basic

- \* You may consult the basic competencies students will have to achieve by the end of the Master's degree at the following address: [http://estudis.uib.cat/master/comp\\_basiques/](http://estudis.uib.cat/master/comp_basiques/)

## Content

### Range of topics

#### Topic 1. Biological Membranes

Structure and functions of the cell membrane. Methods for isolation and characterization of biological membranes.

#### Topic 2. Membrane lipids

Membrane lipid classes. Membrane fluidity. Lipid membrane domains. The membrane lipid component and health: scientific evidences.

#### Topic 3. Lipid research

Methods for lipid analysis. Introduction to lipidomic analysis.

#### Topic 4. Membrane signaling

Signalling by membrane receptors. Lipids in cell signaling

#### Topic 5. Bioactive lipids

Sphingolipids as bioactive lipids. Implications in human health.

## Teaching methodology

"Campus Extens" is based on the digital platform MOODLE, an educational instrument promoting electronic distance learning. The students will benefit from an electronic calendar pointing out interesting news and electronic documents.

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### Workload

The following table shows the distribution in hours of the different attended and non-attended student activities and their equivalent in credits according to the European Credit Transfer and Accumulation System. (1 ECTS credit = 25 hours of estimated student workload).

#### In-class work activities (0.9 credits, 22.5 hours)

Modality	Name	Typ. Grp.	Description	Hours
Theory classes	Lectures	Large group (G)	The aim of the lectures is to convey scientific background knowledge and critical information. This goal will be achieved by oral presentation of the topics by the professor. Active participation of the students in form of questions or critical remarks will help to provide a more dynamic teaching environment. Study questions, recommended readings and article comments will accompany the lectures. They form an integral part of the methodology.	12
Assessment	Oral Presentation	Large group (G)	The aim of this activity is to engage the student himself in the preparation of an oral presentation about an academic subject related to the course topics. The oral presentation in the format Microsoft Powerpoint will be conducted by each student in front of their fellow students. For the oral presentation, each student will have a maximum of 25 min and afterwards, the student must answer specific questions set by the audience during 10 min.	4
Assessment	Bibliographic work	Small group (P)	The aim of this activity is to engage the student himself in the preparation of a written report about an academic subject related to the course topics. The extension of the report shall not exceed 2-leafs.	4
Other	Exercises and activities	Large group (G)	Supplementary reading activities will be provided to the students to work on them. The analysis of scientific articles will help the students to a better understanding of the scientific knowledge summarised in the oral presentations of the topics.	2.5

At the beginning of the semester a schedule of the subject will be made available to students through the UIBdigital platform. The schedule shall at least include the dates when the continuing assessment tests will be conducted and the hand-in dates for the assignments. In addition, the lecturer shall inform students as to whether the subject work plan will be carried out through the schedule or through another way included in the Aula Digital platform.

#### Distance education tasks (2.1 credits, 52.5 hours)

Modality	Name	Description	Hours
Individual self-study	Study	The lectures must be summarized by the students in order to consolidate their knowledge about the specific matter. Any doubts and questions arising during self-study will be solved during the next lecture and the exercise sections	20

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Modality	Name	Description	Hours
Individual self-study	Preparation of an oral presentation and a report	The report must be prepared as a digital file and the maximum extension will be 2 pages. The oral presentation must be prepared as a digital file in the format Microsoft Powerpoint. The maximum time for the oral presentation will be 25 min. Both digital files (report and oral presentation) must be presented to the professor 4 days in advance to the oral presentation data.	20
Group or individual self-study	Exercises and activities	By solving exercises, reading scientific articles and comments on articles, students will seat general concepts summarised in the lectures. The exercises and activities must be done the day set for it on the subject timetable. Some activities will be done during the lecture section.	12.5

### Specific risks and protective measures

The learning activities of this course do not entail specific health or safety risks for the students and therefore no special protective measures are needed.

### Student learning assessment

#### Student learning assessment

The student will receive a numerical mark between 0 and 10 in each of the activities listed in the following table, being 10 the highest possible mark. The minimum total mark to regard an activity or the entire course as successfully completed is 5. The total mark will be calculated from the marks of the distinct activities as indicated in the scheme below. Failing to satisfy the minimum requirements of one or several activities, does not make it automatically impossible to successfully complete the course. If the insufficient mark(s) can be compensated by marks obtained in other activities leading to a total mark of 5 or higher, the course will also be regarded as successfully completed. Only if the total mark were below 5, the student would get the opportunity to be reassessed in those activities that did not satisfy the minimum requirements and that were designated as recoverable according to the course guide.

#### Frau en elements d'avaluació

In accordance with article 33 of Academic regulations, "regardless of the disciplinary procedure that may be followed against the offending student, the demonstrably fraudulent performance of any of the evaluation elements included in the teaching guides of the subjects will lead, at the discretion of the teacher, a undervaluation in the qualification that may involve the qualification of "suspense 0" in the annual evaluation of the subject".

#### Oral Presentation

Modality	Assessment
Technique	Oral tests ( <b>non-retrievable</b> )
Description	The aim of this activity is to engage the student himself in the preparation of an oral presentation about an academic subject related to the course topics. The oral presentation in the format Microsoft Powerpoint will be conducted by each student in front of their fellow students. For the oral presentation, each student will

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have a maximum of 25 min and afterwards, the student must answer specific questions set by the audience during 10 min.

Assessment criteria The conduction of the oral presentation will be assessed with the help of a rubric as scoring tool. The set of criteria used in the applied rubric will have been handed out to the students before the oral presentation.

Final grade percentage: 40%

### Bibliographic work

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Modality Assessment

Technique Papers and projects (**retrievable**)

Description The aim of this activity is to engage the student himself in the preparation of a written report about an academic subject related to the course topics. The extension of the report shall not exceed 2-leafs.

Assessment criteria

Final grade percentage: 20%

### Exercises and activities

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Modality Other

Technique Real or simulated task performance tests (**retrievable**)

Description Supplementary reading activities will be provided to the students to work on them. The analysis of scientific articles will help the students to a better understanding of the scientific knowledge summarised in the oral presentations of the topics.

Assessment criteria

Final grade percentage: 20%

### Exercises and activities

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Modality Group or individual self-study

Technique Other methods (**retrievable**)

Description By solving exercises, reading scientific articles and comments on articles, students will seat general concepts summarised in the lectures. The exercises and activities must be done the day set for it on the subject timetable. Some activities will be done during the lecture section.

Assessment criteria

Final grade percentage: 20%

## Resources, bibliography and additional documentation

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### Basic bibliography

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Course discussion will focus on relevant chapters from text books and on scientific literature that students will find on pudmed data base. Recommended text books:

- Biochemistry. Voet D, Voet JG. (2004) John Wiley & Sons, Inc..
- Molecular Cell Biology. H. Lodish (2007). WH Freeman and Company
- The Cell. B. Alberts (2002). Garland Science. Taylor & Francis Group.
- Biochemistry. L. Stryer (2007). W.H. Freeman and Company, N.Y.

### Complementary bibliography

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Specific bibliography:

- The Membranes of Cells. P.L. Yeagle (1993). Academic Press. San Diego. (Chapters 1, 6, 7).
- Membrane Analysis. J. M. Graham and J.A. Higgins (1997). Taylor & francis.
- Life-as a Matter of Fat: The Emerging Science of Lipidomics. Ole G. Mouritsen (2005). Springer-Verlag. Berlin. Heidelberg.
- Membrane Lipid Signaling in Aging and Age-Related Disease. M.P. Mattson (2003). Elsevier. ISBN: 978-0-444-51297-0

### Other resources

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World Wide Web Resources as indicated by the professor.

