



Syllabus

Subject

Subject / Group	10271 - Energy Homeostasis and Functional Foods / 1
Degree	Master's Degree in Nutrigenomics and Personalized Nutrition
Credits	3
Period	First semester
Language of instruction	Spanish

Professors

Lecturers	Office hours for students					
	Starting time	Finishing time	Day	Start date	End date	Office / Building
María Luisa Bonet Piña luisabonet@uib.es						You need to book a date with the professor in order to attend a tutoring session.
Catalina Picó Segura cati.pico@uib.es						You need to book a date with the professor in order to attend a tutoring session.

Context

TEACHING STAFF:

M^a Luisa Bonet (Dra. in Biological Sciences, University of Alicante, 1990) is Professor of Biochemistry and Molecular Biology and researcher in the Nutrigenomics and Obesity group at the Laboratory Molecular Biology, Nutrition and Biotechnology (LBNB) of the UIB. Member of the Center for Biomedical Research Network Pathophysiology of obesity and nutrition (CIBERobn). Her investigation is focused on the mechanisms controlling body fat content and their interaction with nutrients (Molecular nutrition).

Catalina Picó (PhD in Biological Sciences; UIB, 1991). Professor of Biochemistry and Molecular Biology, researcher in the Nutrigenomics and Obesity group, and Deputy Director of the Laboratory of Molecular Biology, Nutrition and Biotechnology (LBNB) of the UIB. Member of the Center for Biomedical Research Network Pathophysiology of obesity and nutrition (CIBERobn). Her research focuses on the field of molecular nutrition and nutrigenomics, particularly in the study of obesity, the mechanisms of body weight regulation, including perinatal programming and epigenetic imprinting, and the effects of certain nutrients on these processes.

SUBJECT:

Within the context of the Official Master in Nutrigenomics and Personalised Nutrition of the UIB, this subject, obligatory and of 3 ECTS credits, has as main objectives the understanding of the variety of processes involved in the maintenance of energy homeostasis and the control of body weight and body composition in mammals, their interrelationships and integration, their interaction with specific nutrients and other food components, and the possibilities generated by such knowledge for functional foods developments.

Learning outcomes:

- Integrate knowledge of the mechanisms of control of food intake, energy expenditure and partitioning in the understanding of obesity.
- Discuss reasonably the contribution of different possible causes for the current obesity pandemic.



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- Apply knowledge of the impact of nutrients and diets on the control mechanisms of energy balance on developments in functional foods for body weight and adiposity control.
- Communicate in an organized and effective way in oral and written presentations
- Work effectively as a member in a team work

Requirements

There are no official requirements other than those needed to access the Master studies.

Recommended

A medium level in Biochemistry, Molecular Biology, Nutrition, Molecular Nutrition and English is highly recommended, as well as having possibilities of a fluent access to Internet .

Skills

Specific

- * To be able to apply the contents of the subject to the promotion of human health (E3) .
- * Understanding the control of energy metabolism and the influence of functional food components on it (E5) .
- * To be able to integrate the knowledge on metabolism with the role of nutrients in disease and health (E6) .

Generic

- * Ability to communicate in oral and written presentations (G10); To be able to incorporate scientific advances in own professional field (G2); Ability to appreciate and participate in teamwork (G8); Ability to collect, organize and critically analyze the research and professional literature of the discipline (G9) .
- * Ability to apply knowledge to solve problems in new or unfamiliar environments within broader (or multidisciplinary) contexts related to the field of study (CB7); To be able to integrate knowledge and handle the complexity to formulate judgments based on information that may be incomplete or limited, being conscious of social and ethical responsibilities (CB8); to be able to communicate their conclusions and the knowledge and rationale underpinning them to both specialists and non-specialists in a clear and unambiguous way (CB9) .

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/

Content

The contents of Nutrigenomics and Personalised Nutrition are the variety of processes involved in the maintenance of energy homeostasis and the control of body weight and body composition in mammals, their interrelationships and integration, their interaction with specific nutrients and other food components, and the possibilities generated by such knowledge for functional foods developments.

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Range of topics

Theme 1. Introduction

Concept of energy homeostasis. Energy balance equation. The obesity pandemics: prevalence and likely causes.

Theme 2. Control of food intake

Non-homeostatic and homeostatic factors in the control of food intake. Short- and long-term homeostatic mechanisms in the control of food intake: satiety signals, adiposity signals, metabolic signals and their integration. Impact of dietary chemicals on food intake and mechanisms involved.

Theme 3. Energy expenditure

Definition, measurement and main components of energy expenditure. Mechanisms of adaptive thermogenesis. Control of energy expenditure. Alterations of energy expenditure in obesity. Modulation of energy expenditure by food components and phytochemicals.

Theme 4. Other determinants of body composition.

Nutrient partitioning among tissues. Balance between lipogenesis and fat oxidation. Balance between protein synthesis and degradation in muscle. Adipocyte number and adipogenesis.

Theme 5. Functional foods for obesity control

Teaching methodology

The methodology is detailed below:

Workload

The workload allocation is as follows:

In-class work activities (0.72 credits, 18 hours)

Modality	Name	Typ. Grp.	Description	Hours
Theory classes	Lessons of theory	Large group (G)	<p>Aim: presentation and explanation by the teacher of main contents in subject themes.</p> <p>Methodology: expositive classes seeking student's participation. Contents will be explained preferentially through dialogue between teacher and students. To facilitate this, power point presentations of the themes will be made available to the students through Campus Extens, so that students have the chance to have already examined this material before the classes.</p>	8
Seminars and workshops	Debate seminars	Medium group 2 (X)	<p>Aim: to develop the skills of finding and structuring relevant information, communicate it, stick to scheduled presentation times, and work in a team basis.</p> <p>Methodology: Debates on concrete aspects related to the subject contents, of general interest, for which two opposite positions can be found in the scientific literature. During the</p>	8

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Modality	Name	Typ. Grp.	Description	Hours
			debate, the students, organized in teams of 2-4 persons, are to present the arguments they have found in favour and against each position. Presentations should adjust to 20-25 minutes per group, plus 5-10 minutes discussion.	
Assessment	Final exam	Large group (G)	<p>Aim: Evaluation of the proper assimilation and understanding by the students of main concepts and contents in the subject and their implications.</p> <p>Methodology: Final exam to be performed by students following the non-continuous evaluation (Itinerary B), which will take place in due dates and will consist in a series of questions of short answer and of reasoning.</p>	2

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 (2.28 credits, 57 hours)

Modality	Name	Description	Hours
Individual self-study	Questionnaires	<p>Aim: evaluation of the degree of understanding and maturity in the subject reached by the students.</p> <p>Methodology: students will have to answer in written form a minimum of two questionnaires, designed to cover main concepts in the subject and to stimulate reasoning skills and the autonomous search of relevant information.</p>	10
Individual self-study	Study and bibliography reading	<p>Aim: to assimilate and extend concepts and contents.</p> <p>Methodology: individual studying with the help of the material provided by the teachers and additional sources of information found by the students themselves. Besides the presentations in power point of the themes, which will include specific bibliography of interest, for the different themes a few review articles of outstanding interest will be made available to the students through Campus Extens.</p>	22
Individual self-study	Bibliographical report	<p>Aim: evaluation of the student capabilities for choosing an interesting theme object of report in the context of the subject; search, structure and synthesise relevant and solid information around it; and communicate this information with rigour in written form.</p> <p>Methodology: the student will have to elaborate, individually, a bibliographical report related to the contents of the subject, which should be no longer than 15 pages plus bibliography, and which should include a summary of less than 300 words, the object and interest of the work, body of the report, conclusions and bibliography.</p>	15
Group self-study	Preparation of the debate seminars	<p>Aim: To develop the ability to search and structure relevant information, presenting it in public, and to do so in a team-basis.</p> <p>Methodology: Students shall organize themselves in groups of 2-4 persons. Each group is to select an aspect for debate, related to the subject contents, of general interest, and for which two opposite positions can be found in the</p>	10

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Modality	Name	Description	Hours
		scientific literature. Students should identify, compile and structure main arguments in favour and against each position for their public presentation. Prior the debate itself, each group is to provide the teachers a short summary (less than 300 words) of main contents to be presented, a scheme with the distribution of work/roles among team group members, and a list of the bibliography and other sources of information they have used in preparing the debate.	

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

There are two possible itineraries:

- Itinerary A (continuous evaluation): it implies the regular assistance to the theoretical classes, the participation in the debate seminars and the realization of the questionnaires. This itinerary requires the assistance to at least 50% of the lessons and seminars.
- Itinerary B: designed for those students that cannot assist regularly to the attended activities of the course. It implies the realization of the final exam, the questionnaires and a bibliographical report.

Students are encouraged to follow itinerary A.

Each element of evaluation will be scored 0 to 10. The final mark of the subject will be the powdered media of the marks obtained in each element of evaluation. To pass the subject, this powdered medium should be 5 or more. If lower, activities specified as recoverable can be recovered in the following, extraordinary call.

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".

Lessons of theory

Modality	Theory classes
Technique	Attitude scales (non-retrievable)
Description	Aim: presentation and explanation by the teacher of main contents in subject themes. Methodology: expositive classes seeking student's participation. Contents will be explained preferentially through dialogue between teacher and students. To facilitate this, power point presentations of the themes will be made

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available to the students through Campus Extens, so that students have the chance to have already examined this material before the classes.

Assessment criteria Assistance

Final grade percentage: 15% for pathway A

Final grade percentage: 0% for pathway B

Debate seminars

Modality Seminars and workshops

Technique Other methods (**non-retrievable**)

Description Aim: to develop the skills of finding and structuring relevant information, communicate it, stick to scheduled presentation times, and work in a team basis. Methodology: Debates on concrete aspects related to the subject contents, of general interest, for which two opposite positions can be found in the scientific literature. During the debate, the students, organized in teams of 2-4 persons, are to present the arguments they have found in favour and against each position. Presentations should adjust to 20-25 minutes per group, plus 5-10 minutes discussion.

Assessment criteria **Related to the debate prepared by the student's group:** degree of insight into the theme; clarity of the exposition; degree of preparation; coordination and distribution of work among group members; degree of maturity in his/her answers to questions by professors and classmates.

Related to debates prepared by other groups: assistance to the debates, and participation in their evaluation.

Final grade percentage: 40% for pathway A

Final grade percentage: 0% for pathway B

Final exam

Modality Assessment

Technique Short-answer tests (**retrievable**)

Description Aim: Evaluation of the proper assimilation and understanding by the students of main concepts and contents in the subject and their implications. Methodology: Final exam to be performed by students following the non-continuous evaluation (Itinerary B), which will take place in due dates and will consist in a series of questions of short answer and of reasoning.

Assessment criteria Quantity and quality of the answers to the questions.

Final grade percentage: 0% for pathway A

Final grade percentage: 50% for pathway B

Questionnaires

Modality Individual self-study

Technique Short-answer tests (**retrievable**)

Description Aim: evaluation of the degree of understanding and maturity in the subject reached by the students. Methodology: students will have to answer in written form a minimum of two questionnaires, designed to cover main concepts in the subject and to stimulate reasoning skills and the autonomous search of relevant information.

Assessment criteria Quality, adequacy and originality of the answers.

Final grade percentage: 40% for pathway A

Final grade percentage: 20% for pathway B

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Bibliographical report

Modality	Individual self-study
Technique	Papers and projects (retrievable)
Description	Aim: evaluation of the student capabilities for choosing an interesting theme object of report in the context of the subject; search, structure and synthesise relevant and solid information around it; and communicate this information with rigour in written form. Methodology: the student will have to elaborate, individually, a bibliographical report related to the contents of the subject, which should be no longer than 15 pages plus bibliography, and which should include a summary of less than 300 words, the object and interest of the work, body of the report, conclusions and bibliography.
Assessment criteria	Adequacy of the theme chosen, inclusion in the work of all the required sections, general quality of the work, correct use of the bibliography and of citation systems.

Final grade percentage: 0% for pathway A

Final grade percentage: 30% for pathway B

Preparation of the debate seminars

Modality	Group self-study
Technique	Other methods (non-retrievable)
Description	Aim: To develop the ability to search and structure relevant information, presenting it in public, and to do so in a team-basis. Methodology: Students shall organize themselves in groups of 2-4 persons. Each group is to select an aspect for debate, related to the subject contents, of general interest, and for which two opposite positions can be found in the scientific literature. Students should identify, compile and structure main arguments in favour and against each position for their public presentation. Prior the debate itself, each group is to provide the teachers a short summary (less than 300 words) of main contents to be presented, a scheme with the distribution of work/roles among team group members, and a list of the bibliography and other sources of information they have used in preparing the debate.
Assessment criteria	Delivery to the teachers of the deliverables associated to the debate in due time.

Final grade percentage: 5% for pathway A

Final grade percentage: 0% for pathway B

Resources, bibliography and additional documentation

Basic bibliography

Presentations of the themes prepared by the teachers and made available to the students will include the bibliography used in their preparation.

Useful sources of information are as well certain internet sites of recognized prestige, such as those of research consortiums and societies devoted to Nutrigenomics, among them the internet site of the Network of Excellence in Nutrigenomics NuGO, to which the Laboratory of Molecular biology, Nutrition and Biotechnology leading the Master belongs (<http://www.nugo.org/everyone>).

Complementary bibliography

The teachers will provide the students review articles of outstanding interest as complementary bibliography for each lesson.





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Other resources

- Internet site of the Network of Excellence in Nutrigenomics NuGO: <http://www.nugo.org/everyone>.

