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|----------------|--|
| Academic year  | 2016-17  |
| Subject        | 10277 - Methods and Techniques in Nutrigenomics and Personalised Nutrition |
| Group          | Group 1, 2S  |
| Teaching guide | A  |
| Language       | English  |

### Subject identification

|                          |  |
|--------------------------|--|
| <b>Subject</b>           | 10277 - Methods and Techniques in Nutrigenomics and Personalised Nutrition               |
| <b>Credits</b>           | 0.72 de presencials (18 hours) 2.28 de no presencials (57 hours) 3 de totals (75 hours). |
| <b>Group</b>             | Group 1, 2S (Campus Extens)  |
| <b>Teaching period</b>   | Second semester  |
| <b>Teaching language</b> | Spanish  |

### Professors

| Lecturers  | Horari d'atenció als alumnes |                |     |            |             |   |
|--|------------------------------|----------------|-----|------------|-------------|---|
|  | Starting time                | Finishing time | Day | Start date | Finish date | Office  |
| Francisca Serra Vich<br><a href="mailto:francisca.serra@uib.es">francisca.serra@uib.es</a> |                              |                |     |            |             | You need to book a date with the professor in order to attend a tutorial. |

### Contextualisation

This is a compulsory matter in the Master on Nutrigenomics and Personalised Nutrition. This matter comes in the second semester, after the introductory matters. The aim of this subject is to go in further detail on methods and techniques characteristic of Nutrigenomic studies.

Francisca Serra is Prof. of Nutrition and Food Sciences at UIB and R & D Director in Alimentomica SL. She has been Director of R & D Service of the University (1993-96) and National Expert at the EC, DG for Science, Research and Development (Brussels) (1997-2000). Her research focuses on molecular basis of obesity, particularly the interaction between genes and nutrients (nutrigenomics and nutrigenetics) and the impact of diet on early developmental stages (epigenetics) on susceptibility to obesity in adulthood. It is also of her interest, the study and characterization of functional foods that could help to counteract obesity.

### Requirements

#### Recommendable

Knowledge on Nutrigenomics and good comprehension in English is advisable.

Lectures are in both, English and Spanish. Reference material on the web is mainly in English.

### Skills



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### Specific

- \* To be continuously updated on the field of Nutrigenomics and Personalized Nutrition.
- \* Integrate knowledge of the main metabolic pathways and the role of nutrients in health and disease.
- \* Ability to Implement specific laboratory techniques in the field of Molecular Nutrition and Nutrigenomics.

### Generic

- \* Ability to apply critical, logical and creative thinking in their work.
- \* Ability to articulate knowledge in oral and written presentations. Ability to carry out their work in English (language internationally recognized in the discipline).
- \* Learn to incorporate scientific advances to the own professional field.
- \* Ability to formulate hypothesis, design and successfully implement pilot studies in the field of molecular nutrition and nutrigenomics.
- \* Respect for ethics and intellectual integrity.
- \* Ability to collect and systematize the research and professional literature of the discipline. Ability to critically analyze relevant literature.
- \* Ability to analyze data and draw conclusions from research results.
- \* Ability to work inter-disciplinary, in an autonomous way and with initiative. Ability and flexibility to solve problems effectively.
- \* Know in depth the field of Nutrigenomics and Personalized Nutrition and its impact on society.

### 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

### Theme content

1. Characteristics of Nutrigenomic studies
2. Microarrays.
3. Methods for genomic studies.
4. Methods for transcriptomic studies
5. Technical aspects of proteomics
6. Applications of proteomics
7. Approach to metabonomic studies
8. Therapeutic Applications
9. Applications in the food sector

## Teaching methodology

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### In-class work activities

| Modality               | Name                | Typ. Grp.        | Description  | Hours |
|------------------------|---------------------|------------------|--|-------|
| Theory classes         | Lectures            | Large group (G)  | Introduction to the main aspects of specific techniques.<br>Lectures based on power-point schemes.   | 11    |
| Seminars and workshops | Techniques workshop | Medium group (M) | Work to prepare in further detail specific methodological aspects<br>Team groups working in a joint collaborative virtual space  | 3     |
| Assessment             | Assessment test     | Large group (G)  | To assess the comprehension of the matter and the acquisition of the programmed competences<br>Questions and/problems to show up that the competences have been acquired | 4     |

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 Campus Extens platform.

### Distance education work activities

| Modality              | Name                  | Description  | Hours |
|-----------------------|-----------------------|--|-------|
| Individual self-study | Tasks                 | Go in deep detail on specific aspects of methods and techniques in Nutrigenomics.<br>Reference material for study, consultation and further details will be available at the web site of the matter.   | 37    |
| Group self-study      | Web site construction | Go in deep detail on specific aspects of methods and techniques in Nutrigenomics.<br>Reference material for study, consultation and further details will be available at the web site of the matter.<br>Collaborative joint space will be available to share material between the students | 20    |

### 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

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### Lectures

|                     |   |
|---------------------|---|
| Modality            | Theory classes  |
| Technique           | Observation techniques ( <b>non-retrievable</b> )   |
| Description         | Introduction to the main aspects of specific techniques. Lectures based on power-point schemes. |
| Assessment criteria | Assistance and participation  |

Final grade percentage: 20% for the training plan A

Final grade percentage: 0% for the training plan B

### Techniques workshop

|                     |  |
|---------------------|--|
| Modality            | Seminars and workshops   |
| Technique           | Papers and projects ( <b>retrievable</b> )   |
| Description         | Work to prepare in further detail specific methodological aspects Team groups working in a joint collaborative virtual space   |
| Assessment criteria | Participation; quality of the project, delivery on time.<br><br>This activity is evaluated together with the group self-study activity.<br><br>For those students of way A, which do not arrive to the qualification of 4 (over 10), a new delivery of the improved project can be done. The deadline is the same day scheduled for the final exam |

Final grade percentage: 40% for the training plan A

Final grade percentage: 0% for the training plan B

### Assessment test

|                     |   |
|---------------------|---|
| Modality            | Assessment  |
| Technique           | Short-answer tests ( <b>non-retrievable</b> )   |
| Description         | To assess the comprehension of the matter and the acquisition of the programmed competences Questions and/problems to show up that the competences have been acquired |
| Assessment criteria | Content and quality of the answers  |

Final grade percentage: 0% for the training plan A

Final grade percentage: 50% for the training plan B

### Tasks

|                     |  |
|---------------------|--|
| Modality            | Individual self-study  |
| Technique           | Extended-response, discursive examinations ( <b>retrievable</b> )  |
| Description         | Go in deep detail on specific aspects of methods and techniques in Nutrigenomics. Reference material for study, consultation and further details will be available at the web site of the matter.  |
| Assessment criteria | Accomplishment of the tasks; delivery on time; quality of the answers.<br><br>For those students of A way which do not arrive to the qualification of 4 (over 10), an assessment test will be planned and scheduled the same day of the final exam |

Final grade percentage: 40% for the training plan A

Final grade percentage: 30% for the training plan B

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### Web site construction

|                     |   |
|---------------------|---|
| Modality            | Group self-study  |
| Technique           | Papers and projects ( <b>non-retrievable</b> )  |
| Description         | Go in deep detail on specific aspects of methods and techniques in Nutrigenomics. Reference material for study, consultation and further details will be available at the web site of the matter. Collaborative joint space will be available to share material between the students  |
| Assessment criteria | Participation; quality of the project, delivery on time.<br><br>For those students following the path B, the same day of the final exam a questionnaire will be prepared in order to assess on individual basis, that they have gone on further detail on specific aspects of methods and techniques in Nutrigenomics (as those worked by the web site construction on team activities) |

Final grade percentage: 0% for the training plan A  
Final grade percentage: 20% for the training plan B

### Resources, bibliography and additional documentation

#### Basic bibliography

Periodical publications: Nature Methods, Current Opinion in Biotechnology, Trends in Biotechnology, and on

#### Complementary bibliography

- \* Afman, L and M Muller (2006). Nutrigenomics: from molecular nutrition to prevention of disease J Am Diet Assoc 106(4): 569-76
- \* Barrett, C L, T Y Kim, H U Kim, B O Palsson and S Y Lee (2006). Systems biology as a foundation for genome-scale synthetic biology Curr Opin Biotechnol 17(5): 488-92
- \* Bulyk, M L (2006). DNA microarray technologies for measuring protein-DNA interactions Curr Opin Biotechnol 17(4): 422-30
- \* Elliott, R M and I T Johnson (2007). Nutrigenomic approaches for obesity research Obes Rev 8 Suppl 1: 77-81
- \* Fichou, Y and C Ferec (2006). The potential of oligonucleotides for therapeutic applications Trends Biotechnol 24(12): 563-70

