GHENT UNIVERSITY

Course Specifications

From the academic year 2020-2021 up to and including the academic year

Genomics, Transcriptomics and Proteomics (C004249)

Due to Covid 19, the education and assessment methods may vary from the information displayed in the schedules and course details. Any changes will be communicated on Ufora.

Course size *(nominal values; actual values may depend on programme)*

Credits 3.0 **Study time 84 h** **Contact hrs** 30.0h

Course offerings in academic year 2021-2022

A (semester 1) English Gent

Lecturers in academic year 2021-2022

Melo, Eduardo FAR001 lecturer-in-charge

Offered in the following programmes in 2021-2022	**crdts**	**offering**
International Master of Science in Marine Biological Resources	3	A

Teaching languages

English

Keywords

Genomics. Transcriptomics. Proteomics.

Position of the course

Contents

Genome organization of prokaryotes and eukaryotes. Mechanisms of genome stability, alteration and evolution. Genomic recombination. Techniques of nucleic acids analysis. DNA markers technologies. Identification of genes only recognizable by their impact in the phenotype: a) Map based cloning; b) Genome wide association studies (GWAS); c) Identification of regions of homozygosity (ROHs). Genomic and expression libraries. Genomic databases. Next generation sequencing techniques. Quantitative analysis of gene expression. From microarrays to RNAseq. Real time PCR. Epigenetic modulation. One genome multiple proteomes. Resolution of complex protein mixes through chromatographic techniques and 2D gel electrophoresis. Digestion techniques of proteins in peptides. Quantitative proteomics: Isotope (ICT) and Fluorescence (DIGE) labelling. Analysis of proteins by mass spectrometry. Identification of post-translational modifications. Protein arrays.

Initial competences

Basic knowledge on Cell Biology, Classical and Molecular Genetics, and on Molecular Biology techniques.

Final competences

1 Students are supposed to acquire theoretical knowledge and basic practical skills enabling them to feel more confident when joining modern companies involved in bioproduction.
2 Ability to perform high-level modern scientific research in the field of Genomics, Transcriptomics and Proteomics.
3 Ability to initiate more advanced (e.g., Ph.D.) study programs that equire relatively deep knowledge on the field of Genomics, Transcriptomics and Proteomics.

Conditions for credit contract

Access to this course unit via a credit contract is determined after successful competences assessment

Conditions for exam contract

This course unit cannot be taken via an exam contract

Teaching methods

Practicum, Seminar, Lecture, Seminar: coached exercises

Learning materials and price

- Slides from the lectures are provided to students through the tutorial platform.
- The library has rich resources available through the web of knowledge.
- Recommended textbooks are available in the library and on-line.

References

- Power-presentations of theoretical classes.
- Protocols of practical classes.
- Scientific articles used for analysis and discussion in seminars.
- Some basic compendia in the University Library.

Students are encouraged to consolidate their knowledge on the topics discussed in classes by wide Internet search of scientific publications.

Course content-related study coaching

Tutorials are provided as requested for coaching or problem resolution. 2h per week are set aside for resolution of problems students may have.

Assessment moments

end-of-term and continuous assessment

Examination methods in case of periodic assessment during the first examination period

Skills test, Written examination with open questions

Examination methods in case of periodic assessment during the second examination period

Skills test, Written examination with open questions

Examination methods in case of permanent assessment

Report, Participation

Possibilities of retake in case of permanent assessment

examination during the second examination period is possible

Extra information on the examination methods

Students can take two partial examinations (not mandatory) during the semester, or to take a written examination at the end of semester. Participation and performance during seminars and practical classes, and the respective report, will be also evaluated.

Calculation of the examination mark

The written examination with open questions (or two the average of two partial examinations during the semester) will account for 80% of the final mark, the remaining 20% are obtaining in seminars and practical classes (report included).