

Frontiers of Integrative Synthetic Biology Research II

MASTER'S DEGREE IN INTEGRATIVE SYNTHETIC BIOLOGY

UNIVERSIDAD INTERNACIONAL MENÉNDEZ PELAYO

This document can be used as reference documentation of this subject for the application for recognition of credits in other study programmes. For its full effect, it should be stamped by UIMP Student's Office.



GENERAL DATA

Name

Frontiers of Integrative Synthetic Biology Research II

Code

102629

Academic year

2024-25

Degree

[MASTER'S DEGREE IN INTEGRATIVE SYNTHETIC BIOLOGY](#)

ECTS Credits

15

Type

MANDATORY

Duration

Cuatrimestral

Language

COMPETENCES

General competences

CG2 - Critically approach the topics covered in Integrative Synthetic Biology.

CG3 - Contribute to developing new ideas (models or hypotheses, strategies, methodologies or combinations thereof) in the field of Integrative Synthetic Biology.

CG4 - Communicate with colleagues in the field of Integrative Synthetic Biology to pass on knowledge about molecular and cell aspects of synthetic biology and their applications in environmental and biomedical fields.

CG5 - Understand the impact of scientific and methodological advances in generating knowledge and developing new technologies with applications for improving health and the environment.

Transversal competences

CT1 - Prepare, write and publicly defend scientific and technical reports.

CT2 - Work in multidisciplinary teams.

CT4 - Boost motivation for scientific research.

Specific competences

CE1 - Analyse the structural features of biological macromolecules and their interactions to give rise to functionally active complexes.

CE2 - Apply chemical and biological approaches to molecular recognition studies and developing drugs.

CE3 - Typify minimal natural and synthetic systems to improve our knowledge about the fundamental principles of biological function that will be the basis for new bio/nano-technology and biomedicine applications.

CE4 - Develop a comprehensive overview of the advances in fundamental molecular and cell biology research, and its applications in biomedicine and/or the environment.

LEARNING PLAN

Training activities

Training activity	Hours*	% On site
TA1.- Master classes	40	100
TA2.- Practical classes	80	100
TA3.- Tutorials	80	100
TA4.- Individual and group work	40	100
TA6.- Individual student work	510	0
TOTAL	750	

Teaching methods

M1 Master classes

M2 Practical classes and Seminars

M3 Tutorials

EVALUATION

Evaluation system

Evaluation systems	Minimum rate	Maximum rate
E1 Exams	45	65
E2 Evaluation of individual work	15	35
E3 Evaluation of practices and seminars	15	35
E4 Evaluation of attendance and participation	5	25

FACULTY

Coordinator/s

Peñalva Soto, Miguel Ángel

Doctor en Ciencias Biológicas.

Profesor de Investigación (CSIC).

Peretó Magraner, Juli

Doctor en química.

Catedrático de Universidad, Bioquímica y Biología Molecular (Universitat de València).

Instituto de Biología Integrativa de Sistemas I2SysBio (Universitat de València-CSIC).

Rivas Caballero, Germán Alejandro

Lecturers

Elani , Yuval

PhD Chemical Biology, Imperial College London, 2014

Lecturer Chemical Engineering Department

Imperial College London

Conti , Elena

Prof. Dr.

Director

Max Planck Institute of Biochemistry / Department of Structural Cell Biology

Danelon , Christophe

Doctor.

Associate Professor.

Delft University of Technology.

Suárez Díez, María

Dr.

Catedrático y director de departamento (Full professor and chair Systems and Synthetic Biology).

Wageningen University.

Göpfrich , Kerstin

Dr.

Research Group Leader.

Max Planck Institute for Medical Research.

Jiménez Zarco, José Ignacio

Dr.

Reader in Synthetic Biology.

Imperial College London.

Moon , Tae Seok

Full Professor.

Full Professor of Synthetic Biology.

J. Craig Venter Institute.

Musacchio , Andrea

Max Planck Institute of Molecular Physiology, Dortmund.

Ellis , Thomas

PhD in Pharmacology, University of Cambridge.

Professor of Synthetic Genome Engineering.

Imperial College Centre for Synthetic Biology (IC-CSynB) and the Department of Bioengineering at Imperial College, London.

Becker , Anke

Professor.

Chair Dept. Microbiology.

University of Marburg.

Ledesma Amaro, Rodrigo

Reader.

Metabolic Engineering.

Imperial College London.

Pelletier , James

SCHEDULE

Timetable

04/10/2024

11:00 - 12:00

OPENING LECTURE: Synergies between synthetic biology and metabolic engineering for sustainable food production

Rodrigo Ledesma Amaro

Reader
Metabolic Engineering
Imperial College London

25/10/2024

11:00 - 12:30

MISB FRONTIERS: Engineering genomically minimal cells for integrative physiological studies

James Pelletier

CNB-CSIC, Madrid

07/11/2024

15:00 - 16:30

MISB FRONTIERS: DNA nanotechnology and DNA origami for synthetic cells

Kerstin Göpfrich

Doctor
Research Group Leader
Max Planck Institute for Medical Research, Heidelberg

15/11/2024

11:00 - 12:30

MISB FRONTIERS: Constructing minimal cells that can evolve

Christophe Danelon

Associate Professor
Delft University of Technology

22/11/2024

11:00 - 12:30

MISB FRONTIERS: Microfluidics & engineered biomembranes in synthetic cell design

Yuval Elani

PhD - Chemical Biology, Imperial College London
Lecturer - Chemical Engineering Department
Imperial College London

06/02/2025

11:00 - 12:30

MISB FRONTIERS

Tae Seok Moon

Full Professor
full Professor of Synthetic Biology
J. Craig Venter Institute

17/02/2025

11:00 - 12:30

MISB FRONTIERS

Anke Becker

Professor
Chair Dept. Microbiology
University of Marburg

21/02/2025

11:00 - 12:30

MISB FRONTIERS

Thomas Ellis

PhD in Pharmacology, University of Cambridge
Professor of Synthetic Genome Engineering
Imperial College Centre for Synthetic Biology (IC-CSynB) and the Department of Bioengineering
at Imperial College, London

03/03/2025

11:00 - 12:30

MISB FRONTIERS

José Ignacio Jiménez Zarco

Dr.
Reader in Synthetic Biology.
Imperial College London.

22/05/2025

11:00 - 13:00

MISB FRONTIERS: What's in a condensate: Centromeres, Kinetochores, and the Likes

27/05/2025

12:00 - 13:30

MISB FRONTIERS: Using Nature's Building Blocks for Next-Gen Bioinspired Tech: Cellular Bionics

Elena Conti

Profesor Dr.
Max Planck Institute of Biochemistry / Department of Structural Cell Biology

27/06/2025

12:30 - 14:00

MISB FRONTIERS

María Suárez Díez

Catedrático y director de departamento (Full professor and chair Systems and Synthetic Biology)
Wageningen University