COURSE OUTLINE

(1) GENERAL

SCHOOL	Health Sciences		
ACADEMIC UNIT	Medicine		
LEVEL OF STUDIES	Post-graduate		
COURSE CODE	**MKBB301**	**SEMESTER**	**B (3rd)**
COURSE TITLE	**Development, writing and defense of the Master's Thesis**		
INDEPENDENT TEACHING ACTIVITIES *if credits are awarded for separate components of the course, e.g. lectures, laboratory exercises, etc. If the credits are awarded for the whole of the course, give the weekly teaching hours and the total credits*		**WEEKLY RESEARCH WORK HOURS**	**CREDITS**
Laboratory research in Research Host Laboratory		30	30
Add rows if necessary. The organisation of teaching and the teaching methods used are described in detail at (d).			
COURSE TYPE *general background, special background, specialised general knowledge, skills development*	Special background (post-graduate laboratory research in Research Host Lab)		
PREREQUISITE COURSES:	MKBB201, MKBB202		
LANGUAGE OF INSTRUCTION and EXAMINATIONS:	Greek and English		
IS THE COURSE OFFERED TO ERASMUS STUDENTS	Yes		
COURSE WEBSITE (URL)	http://msc-mcbb.ac.uoi.gr/Courses.Semester Cn-start http://msc-mcbb.ac.uoi.gr/Courses.Semester Cn-end		

(2) LEARNING OUTCOMES

Learning outcomes

The course learning outcomes, specific knowledge, skills and competences of an appropriate level, which the students will acquire with the successful completion of the course are described.

Consult Appendix A

- *Description of the level of learning outcomes for each qualifications cycle, according to the Qualifications Framework of the European Higher Education Area*
- *Descriptors for Levels 6, 7 & 8 of the European Qualifications Framework for Lifelong Learning and Appendix B*
- *Guidelines for writing Learning Outcomes*

Students engage in research work in a Research Host Lab for their MSc project. They are expected to acquire research experience and knowledge in an interdisciplinary research environment, and specialize in a particular research field in the context of completion, writing and presentation of an original research work. Their research work is expected to be presented by them in an open-audience defense process and evaluated by a five-membered committee of examiners. They are also expected to be able to communicate new scientific knowledge derived from their research work as well as the rationale, experimental results and scientific reasoning behind the relevant conclusions and discussion (in the context of the MSc thesis defense). Successful completion of the third semester of studies leads to a Postgraduate Degree in Molecular and Cellular Biology and Biotechnology, and development of competencies that allow potential continuation in third-cycle (doctoral) studies in a competent and largely autonomous manner, in the

research area of molecular and cellular biology and biotechnology/health biotechnology.

General Competences

Taking into consideration the general competences that the degree-holder must acquire (as these appear in the Diploma Supplement and appear below), at which of the following does the course aim?

Search for, analysis and synthesis of data and information, with the use of the necessary technology	*Project planning and management*
Adapting to new situations	*Respect for difference and multiculturalism*
Decision-making	*Respect for the natural environment*
Working independently	*Showing social, professional and ethical responsibility and sensitivity to gender issues*
Team work	*Criticism and self-criticism*
Working in an international environment	*Production of free, creative and inductive thinking*
Working in an interdisciplinary environment	*……*
Production of new research ideas	*Others…*
	…….

- Search for, analysis and synthesis of data and information, with the use of the necessary technology
- Adaptation to new situations (in the context of work in the hosting research team)
- Decision-making
- Working independently
- Team work
- Working in an interdisciplinary environment
- Exposure/working in an international environment (due to involvement in the program of researchers and research teams from countries outside Greece)
- Respect for difference and multiculturalism
- Criticism and self-criticism
- Production of free, creative and inductive thinking
- Contribution to the production of new research ideas
- Development, completion, writing and presentation of an original research project in the context of collaborative work in the hosting research team
- Communication of new scientific knowledge derived from an original research project and of the rationale, experimental results and scientific reasoning behind the relevant conclusions and discussion (in the context of presentation and open-audience defense of their postgraduate research diploma thesis)
- Acquirement of competencies that allow potential continuation in third-cycle (doctoral) studies in a competent and largely autonomous manner, in the area of molecular and cellular biology and biotechnology/health biotechnology

(3) SYLLABUS

Students actively engage in research work in a Research Host Lab for the preparation, development, completion, writing, and defense of their MSc research project thesis. The work involves research interactions with other members of the team and collaborating members from other labs, study of relevant research literature, experimental research work under the supervision of senior members of the team, preparation, writing and, finally, defense of the MSc thesis in an open-audience presentation.

Objectives

Awarding of a Postgraduate Degree in Molecular Cellular Biology and Biotechnology, combined with development of research experience and knowledge in the context of research team work in an interdisciplinary environment. Development of competencies that allow potential continuation in third-cycle (doctoral) studies in a competent and largely autonomous manner, in the research area of molecular and cellular biology and biotechnology/health biotechnology.

(4) TEACHING and LEARNING METHODS - EVALUATION

DELIVERY
Face-to-face, Distance learning, etc.

Students are actively engaged in research study in a Research Host Lab and participate in face-to-face research team meetings, work independently and in team to perform a series of experiments for their MSc project, under supervision by senior members of the team, they study relevant research literature, and prepare writing and defense of their MSc thesis.

USE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY
Use of ICT in teaching, laboratory education, communication with students

Powerpoint slides and videos are used in the context of presentations in the research team meetings and in the final MSc thesis defense. The final MSc defense is an open-audience defense process evaluated by a five-membered committee of examiners and open to questions and comments by all members of the PPS and the University of Ioannina research community. The MSc defense is held either through the internet (zoom or MS Teams) or in a face-to-face mode, but always allowing for remote participation of research collaborators and members from other Institutions (e.g. from abroad) through zoom or MS teams.
Various bioinformatic tools are applied and used by the students in the context of their MSc research. Complementary teaching material is also accessible to students through the e-course system of the University of Ioannina and appropriate databases (pubmed, scopus, pdb, etc.).
E-mail addresses of the teaching staff are freely used as a means of communication with the students.

TEACHING METHODS
The manner and methods of teaching are described in detail.
Lectures, seminars, laboratory practice, fieldwork, study and analysis of bibliography, tutorials, placements, clinical practice, art workshop, interactive teaching, educational visits, project, essay writing, artistic creativity, etc.

The student's study hours for each learning activity are given as well as the hours of non-directed study according to the principles of the ECTS

Activity	***Semester workload***
Research team meetings	40
Laboratory research work for the experiments needed for development and completion of the MSc research project	120
Study and analysis of relevant research bibliography	40
Writing of the MSc thesis	60
Preparation for presentation and open-audience defense of the MSc research thesis	40
Course total	***300***

STUDENT PERFORMANCE EVALUATION
Description of the evaluation procedure

Language of evaluation, methods of evaluation, summative or conclusive, multiple choice questionnaires, short-answer questions, open-ended questions, problem solving, written work, essay/report, oral examination, public presentation, laboratory work, clinical examination of patient, art interpretation, other

Language of evaluation: Greek and English
Methods:
(a) Intermediate evaluation of the research work progress based on the student presentations in the research team meetings (group meetings). Student presentations are evaluated by the research team leader for understanding of concepts, objectives, background, state-of-the-art, aims, methodology of the project, and preliminary experimental results

Specifically-defined evaluation criteria are given, and if and where they are accessible to students.	derived in the context of the relevant research. (b) Evaluation of the written text of the MSc thesis by the supervisor-team leader and two additional teaching staff members who act together with the supervisor as three-membered advisory committee and, at a second stage, by all members of the five-membered evaluation committee, which includes the advisory committee and two members of the Steering Committee of the program (the Director and one more member); the same two members of the Steering-Committee participate in all MSc theses evaluation committees for students of the same enrollment or graduation year. (c) Evaluation of the oral, open-audience MSc thesis defense presentation by a five-membered evaluation committee (as above). The final grade is the average of the grades given by each one of the five examiners based on evaluation of the student's performance in presenting their research with comprehensiveness, coherence and clarity, answering questions and discussing their findings, and also the amount and quality of experimental work performed, and their understanding of the project concepts, perspectives and rationales. ***Evaluation criteria:*** Grades are given by each one of the five members of the evaluation committee of the MSc thesis defense. The final grade is the average of these five grades. The rating given by the supervisor (research team leader in the Host Lab where the MSc project has been implemented) is based not only on the final oral presentation and defense and the written text of the thesis but also on the student's work and overall performance in the lab and their intermediate work progress reports in the research team meetings. The ratings given by other members of the committee are based on the final oral presentation and defense and the written text of the MSc thesis. For the oral presentation and defense, students are evaluated for their performance in presenting their MSc research project with comprehensiveness, coherence and clarity, answering questions and discussing their findings, and also the amount and quality of the experimental work performed, and their general understanding of the project concepts, perspectives, and rationales. For the final written text, students are evaluated for coherence, comprehensiveness, competency of references and discussion, clarity of presentation of the aims, objectives and rationales, experimental methodology, results and statistical or other (imaging, bioinformatic) analyses of the data. The written text can be in either Greek or English (the same is valid of the oral defense process) and should follow the guidelines set in the program rules and regulations. Students are obliged to submit their

	MSc thesis written text to the evaluation committee at least 15 days prior to the MSc thesis defense date and, following defense, they are obliged to make any corrections that might be pointed out as necessary for a competent text by the evaluation committee. Student grades are based on a decimal scale. Each examiner's grade is given with accuracy of ±0.5. The final grade average is given with an approximation to three (3) decimal digits. All exam procedures and evaluation criteria are included in the program rules and regulations, which are accessible at the website http://msc-mcbb.ac.uoi.gr.

(5) ATTACHED BIBLIOGRAPHY

- Suggested bibliography:

Peer-reviewed articles from the literature related to the student's MSc research project and the research field interests and work in the Host Lab.

- Related academic journals:

Indicatively: *Nature, Cell, Science, Nat Chem Biol, Nat Protocols, Nat Rev Genet, Cell Rep, Sci Rep, Mol Cell, Dev Biol, Dev Cell, Dev Growth Differ, Stem Cell Res, J Cell Sci, J Mol Biol, J Biol Chem, Current Biology, Nat Rev Cancer, Trends Cell Biol, Cancer Res, Epigenetics, Proteomics, Nucleic Acids Res, Nat Biotechnol, Mol Biotechnol, Enzyme Microb. Technol,* etc., depending on the particular research interests and work related to the Host Lab.