

**MASTER'S DEGREE PROGRAM
IN "BASIC MEDICAL SCIENCES"
OF THE NATIONAL AND KAPODISTRIAN UNIVERSITY OF ATHENS MEDICAL SCHOOL**

M.Sc. INTERNAL REGULATION OPERATION HANBOOK

MOLECULAR BIOMEDICINE

MECHANISMS OF DISEASE, MOLECULAR AND CELLULAR THERAPIES, AND BIOINNOVATION

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1. Short Description

The Medical School of the National and Kapodistrian University of Athens has established a new Postgraduate Studies Program entitled "**Molecular Biomedicine: Mechanisms of Disease, Molecular and Cellular therapies and Bioinnovation**" for the academic year 2016-2017 in accordance with the provisions of the Law 3685 / 08 (FEK 148 A).

The Medical School of Athens undertakes the administrative and secretarial support of the program.

2. Main Program Aims

The main objective of the Postgraduate Studies Program (M.Sc.) in "Molecular Biomedicine: Mechanisms of Disease, Molecular and Cellular therapies and Bioinnovation" is to provide education of international standing in the field of biomedical research and development. Post-graduate students will obtain a strong scientific background, experience and expertise in a highly vibrant and challenging field of modern science.

The main objectives of the MSc are to:

- Offer strong cross-disciplinary training in disease modelling, translational and clinical research, bioinformatics, immunology, genetics, molecular and cellular biology, functional genomics, and epigenetics.
- Provide knowledge and expertise in cutting-edge methodologies and research tools, including transgenic technologies, NGS, proteomics, mouse phenotyping and advanced imaging.
- Offer a variety of complementary, transferable skills, which will enhance the students' career prospects in academic as well as non-academic routes.
- Expose students to the international scientific and industrial community.
- Offer interactions with the private sector to provide training in drug development and evaluation platforms, biomarker development, and a deep insight into how fundamental discoveries and advances are translated to successful investments, thus fostering a culture of entrepreneurship.
- Train students to convey basic scientific knowledge in a professional environment, the scientific community or society in general.

M.Sc. Graduates will be able to successfully and effectively address the growing challenges of the biomedical research field and follow an academic career (PhD etc.) and/or staff research infrastructures in Greece or abroad. Furthermore, M.Sc. graduates can work in research and development (R & D) departments of pharmaceutical companies, and establish/deploy biotechnological knowledge-intensive companies.

3. Master's Degree in Science

The program leads to a Master's degree (M.Sc.) in "Molecular Biomedicine - Disease Mechanisms Molecular and Cellular Therapies and Bioinnovation".

The title is awarded by the Faculty of Medicine of the National and Kapodistrian University of Athens.

The operating rules of the M.Sc. program are described in detail below.

4. Program Validity

The M.Sc. will be valid until the academic year 2024-2025. Upon expiration of this period, the program's necessity for continuation and/or amendment will be assessed accordingly.

5. Eligible Candidates

Eligible candidates are considered graduate students, who meet the necessary requirements for successful attendance from Universities, Technological Educational Institutes and Polytechnics of the Health Sciences discipline (e.g. Medicine, Biology, Molecular Biology, Biochemistry, Chemistry, Chemical Engineering, Physics, Pharmacy, Dentistry, Biotechnology, (Bio)informatics, Nursing and other relevant disciplines of Life Sciences). Candidates wishing to apply coming from non-Biological graduate programs, should have proven basic Molecular Biology knowledge, or will be expected to prove it if selected for an interview.

6. Total Number of admitted Students

The maximum number of students admitted to the M.Sc. is 25 per academic year. The exact number of admitted students per academic year is determined based on the applicants' qualifications and may depend on the availability of resources and lecturers.

7. Program Duration

1. The minimum duration for completing the M.Sc. program is four (4) semesters.

2. Attendance of all four (4) semesters is considered exclusive and compulsory. By the end of the second (2nd) semester, the title of the dissertation project is set, and must be completed by the end of the fourth (4th) semester in order for the M.Sc. to be awarded.

8. Tuition Fees

The M.Sc. program fees are set to 1.000€ per semester, for each student, and must be paid at the beginning of each semester based on the process set by the Special Account for Research Grants (ELKE). Delay in fee payment, may result in cancellation of the M.Sc. student's registration from the program. Tuition fees must be paid upon student registration or at the beginning of each semester. The student retains his/her right for tuition fee reimbursement following a reasoned request to the M.Sc. Steering Committee over a period that will not exceed 30 calendar days past the fee payment deadline.

9. M.Sc. Organization and Operation Bodies

For the organization and operation of the M.Sc. competent bodies are:

- A. Steering Committee (SC)
- B. Director of Studies
- C. Graduate Student Evaluation Committee (GSEC)
- D. Three-membered Examination Committee (TEC)

10. Steering Committee

The "Steering Committee" consists of three (3) Medical School faculty members participating in the M.Sc. (in accordance with the provisions of the Law 3685 / 08, FEK 148 A).

The "Steering Committee" in accordance with the provisions of the Law 3685 / 08 (FEK 148 A) shall be responsible for:

- Determining the selection criteria based on which the graduate students will be selected, as these are determined in Law 3685 / 08 (FEK148A).
- Defining the Graduate Student Evaluation Committee (GSEC), conducting the examination process smoothly and unobstructedly, and appointing, individual examination boards, if deemed necessary.
- Overseeing the overall general compliance with existing legislation and regulation throughout the selection process of graduate-student candidates.
- Validating the list of successfully selected candidates.

- Determining the M.Sc. teaching courses.
- Awarding the M.Sc. diplomas.
- Assigning to each graduate student, his/her supervisor and three-member Examination Committee (TEE) for the MSc dissertation.
- Resolving any matter that may arise not predicted in the current legislation and rules in the MSc Handbook.
- Electing from its members, the Director and Deputy Director of Studies.

11. Director of Studies

The position of Director of Studies may be undertaken by a faculty member of the two senior academic ranks (Professor or Associate Professor) from the Medical School of the National and Kapodistrian University of Athens, as defined by the "Steering Committee". The Director of Studies is responsible for the following:

- A. To assemble the "Steering Committee", as well as create an effective agenda and chair the SC meetings.
- B. To make recommendations to the "Steering Committee" with regard to matters relevant to its activities in which no other operation body is involved.
- C. Ensures that decisions made by the "Steering Committee" are applied.
- D. May establish committees for the handling and resolution of specific issues, following authorization from the "Steering Committee".

12. Graduate Student (GS) Evaluation Committee (EC)

The selection process for the GS is handled by the Evaluation Committee (GSEC) which consists of seven (7) members, comprising of three (3) SC members and four (4) members from collaborating institutes.

The GSEC is responsible for the selection of GS.

The process for GS selection results through evaluation of the following selection criteria (Law 3685 / 08, FEK 148A):

- The overall grade acquired in the undergraduate studies.
- Any recent laboratory or other research related experience.
- The applicant's intention to proceed into a PhD program.
- Related Scientific Activities (dissertation thesis, publications etc).

- Thorough knowledge of the English language.
- Reference letters.
- The applicant's performance at the interview – examination on specific material set by the GSEC.
- The grades acquired in the undergraduate studies especially in subjects related to the M.Sc. course applied for, and the dissertation thesis subject where applicable.

Based on the above criteria, an overall score is formed for each candidate ranging from 0-100. Following the candidates' ranking according to the overall score, the GSEC forms the final list of candidates for admission to the M.Sc. program, as well as those that can be granted scholarships for their studies.

The final list of selected candidates is authenticated by the SC (Law 3685 / 08, FEK 148A).

M.Sc. Attendance of unregistered students or scientists.

It is possible for interested non-enrolled M.Sc. students or scientists to attend particular M.Sc. lectures or lecture series. Access to lectures for non-enrolled students is free of charge. However, in specific cases a fee may apply if deemed necessary. Should fees apply interested attendees will need to request attendance permission from the M.Sc. secretariat.

Unregistered students or researchers who attend M.Sc. lectures will not have the privileges of those enrolled (army deferment, reduced ticket etc.). Moreover where tuition fees apply, an attendance certificate may be issued by the M.Sc. secretariat.

M.Sc. Program Structure

13. M.Sc. Title

The Master of Science program has a minimum duration study of four (4) semesters and may not exceed six (6) semesters. It leads to the acquisition of a Master (M.Sc.) degree in "Molecular Biomedicine - Disease Mechanisms, Molecular and Cellular therapies and Bioinnovation".

Evaluation of the M.Sc. candidates that have applied to the aforementioned M.Sc. degree is performed by the Graduate Student Evaluation Committee (GSEC) as determined each time by the SC. The selection process is completed following a meeting among the GSEC members, who take into consideration the predetermined interview-oral examination, on material relevant to the M.Sc., and the selection criteria mentioned in the announcement (e.g. CV, overall grade acquired, any research experience, recommendation letters, etc.). The GSEC draws up a list of successful M.Sc. candidates and a reserve list.

Any objections against the final and reserve finalists may be raised within 7 calendar days from the date of mounting. The objection, which must be substantiated and specific, is evaluated and a final decision is drawn by the M.Sc. program SC. The SC must inform the complainant of the outcome in writing within 10 calendar days.

14. GS Obligations and rights

To obtain the M.Sc. degree title, attendance of the lecture series as defined in the M.Sc. program curriculum is compulsory.

The course content and duration as well as the credit allocation, are all described in Section 17 below.

M.Sc. students are obliged to:

- Successfully attend all the offered M.Sc. lecture series. A graduate student is deemed to have completed the M.Sc. lecture series only if 80% of the current curriculum course hours have been attended (Lectures and Assigned projects). Alternatively, the lecture series will need to be repeated.
- Be responsible of obtaining all the necessary material (textbooks, photocopied material, articles etc) on time.
- Submit all assigned projects on time.
- Sit all related examinations.
- Attend conferences, seminars and other scientific events related to the M.Sc. program.

Failure to comply with the above may result in a non-pass grade for the respective lecture series or exclusion from the M.Sc. program, should such a recommendation be made by the responsible lecturer and a respective decision be drawn by the SC.

Furthermore, during the first semester each student will select a mentor, who can be one of the M.Sc. program lecturers. The M.Sc. student will communicate regularly with his/her mentor, who will monitor the student's progress, provide scientific/business and academic/professional guidance and help overcome any difficulties that may arise (each lecturer may mentor up to three (3) M.Sc. students per semester).

M.Sc. students may apply to suspend their studies. Authorization can only be granted once throughout the duration of the M.Sc. program by the SC for proven serious reasons. The studies may be suspended for a minimum length of one (1) academic semester and cannot exceed two (2) academic semesters. The latter can only be considered and possibly granted under occasions of prolonged illness, which is verified by a public body/hospital.

When resuming their studies, students will need to attend all the classes, seminars, rotations etc., which were not attended prior to suspension of the studies. M.Sc. students authorized for suspension, upon resuming their studies, remain subject to the rules and regulations described in the program handbook from their respective year of entry.

15. Scholarships

The M.Sc. in “Molecular Biomedicine - Disease Mechanisms, Molecular and Cellular therapies, and Bioinnovation” grants a limited number of scholarships at the beginning of each academic year. The number of scholarships granted is set by the SC, and depends on the availability of funding. The duration of each scholarship is six months. Scholarships are granted to M.Sc. students based on their performance classification and are granted by priority to M.Sc. students exhibiting the greatest levels of financial need.

16. Procedure for obtaining M.Sc. degree - Course Schedule

The courses, taught and practical training, the rotations and all other forms of research activities leading to the award of the Postgraduate Diploma title are biannual.

During the M.Sc. course all graduate students will participate in:

Lectures - covering basic principles, major discoveries and the latest developments in the scientific field of each Unit, together with literature articles/papers and personal examples set by the experienced lecturers. Biomedical/therapeutic/business and methodological/technological developments will be presented in combination. The M.Sc. will use current educational technologies such as webinars and other online tools to broaden the scope of teaching and to align with international standards.

Lectures on transferable skills - will focus on the development of important scientific/business skills, such as oral presentations on research results or new business products, research proposal or business plan writing for receiving grants and finding sponsors, scientific paper or corporate activity report writing, issues on bioethics and ethics in science and business, good safety practices in the laboratory etc.

Seminars/Group discussions (Journal clubs) on pioneering scientific literature - where students will regularly select and present high impact scientific papers relative to the subject of each Unit, analyzing the strategy, methodology, the importance of the findings described and possible weaknesses. These seminars will be under the supervision of each Unit’s lecturers.

Assignments – will be allocated to students as part of the three modules, and depending on the field, these may involve literature reviews, bioinformatics data analyses, critical evaluation of research data or business models etc. Emphasis will be given to group assignments, where

students will be invited to design and perform in groups in order to develop their cooperation skills.

Oral presentations - will be given by students in the context of their courses, assignments and seminars.

Rotations/Dissertation Thesis - During the second semester students will undertake two quarter rotations in different laboratories or companies under the supervision of M.Sc. lecturers (in Greece or abroad). At the beginning of each rotation students will submit a brief Research Proposal for the research work that they will perform and at the end an Overall Report covering the aim/methodology/results/conclusions of the research program will be written and submitted. Upon successful completion of the courses and practical rotations from the first two semesters, and the subsequent renewal of acceptance by the SC, the M.Sc. student will submit to the SC in writing, the research team in which he/she wants to undertake his/her dissertation research work with the consent of the Scientific Responsible. Following completion of the Dissertation Thesis, the student is expected to present his/her work at the end of the 4th semester.

International Conference – relevant to the subject that the student chose for his/her rotation or diploma will be attended, with the financial support of the M.Sc. where necessary and feasible. Graduate students will be encouraged to submit a summary and present research results, where possible.

17. Curriculum

The course language of instruction is English. Graduate students are expected to write their dissertation thesis and all assignments in English and present in the same language.

The M.Sc. program consists of four main modules, which will be attended in parallel: **1. Mechanisms of Disease, 2. Molecular and Cellular therapies, 3. Bio-innovation and 4. Transferable Skills.**

The first module focuses on the practical and theoretical training of students in the design and implementation of research studies, the characterization of molecular and cellular mechanisms underlying human diseases and the in depth investigation of their pathogenesis. The second module will focus on the methods related to the development of targeted and personalized therapies, and will cover the development of small molecules, antibodies, nanoparticles, natural products, bioequivalents etc. for treatment of human disease. Particular emphasis will be given to the use of modern technologies (next generation sequencing, advanced imaging, pharmacogenomics, metagenomics etc.). The third module focuses on the translation of research results, from the laboratory to the clinic, and the identification of business exploitable findings for their further development into innovative products and services. The fourth module focuses on the cultivation of important scientific/business skills, such as oral presentations of

research results or new business products, research proposal or business plan writing, as well as scientific paper writing or corporate activity reports.

1ST SEMESTER	ECTS	MODULE
COMPULSORY COURSES		
Introduction to Basic Laboratory and Clinical Research Methodology	2	1 st
Molecular and cellular mechanisms of chronic inflammation, and metabolic and infectious diseases	3	1 st
Molecular and cellular mechanisms of cancer	2	1 st
Molecular and cellular mechanisms of neurodegenerative diseases	2	1 st
Cutting-edge technologies in molecular biology and genetics	3	1 st
Basic principles in Bioinformatics, Computational Biology and Biostatistics	2	2 nd
Precision Medicine: Methodologies, trends and challenges	2	2 nd
Biological therapies (molecular, genetic and cellular) and drug development - From <i>in silico</i> to <i>in vivo</i>	2	2 nd
Basic principles of entrepreneurship and innovation	4	3 rd
Intellectual properties and exploitation of results	2	3 rd
Transferable skills	4	4 th
Journal Clubs on recent and/or pioneering scientific literature and related assignments	2	
TOTAL – 1ST SEMESTER	30	
2ND SEMESTER	ECTS	MODULE
COMPULSORY COURSES		
Systems Biology and Biotechnology	2	2 nd
Entrepreneurial innovation in medicine and healthcare	2	3 rd
Journal Clubs on recent and/or pioneering scientific literature and related assignments	2	4 th
1 st Rotation - Quarterly Advanced laboratory practice	12	
2 nd Rotation - Quarterly Advanced laboratory practice	12	
TOTAL – 2ND SEMESTER	30	

3RD SEMESTER	
	ECTS
Dissertation Thesis – Lab work	30
TOTAL – 3RD SEMESTER	30
4TH SEMESTER	
	ECTS
Dissertation Thesis – Completion and Thesis writing	20
Research proposal writing	5
Analysis of two research topics	5
TOTAL – 4TH SEMESTER	30

The content and duration of the courses may be updated and adjusted annually by the SC. The total number of Credits (ECTS) required for award of the M.Sc. degree is 120.

18. M.Sc. Student Evaluation

Evaluation of the graduate students is performed in two stages:

1. During the course of the semester, through the work assigned by the respective lecturer
2. At the end of each of the first two semesters through written exams, assignments and/or the oral examination as set by the each course responsible.

For each taught course, there will be one examination period. The first will take place in January at the end of the first semester and the second in July at the end of the second semester. Additionally, for each course there will be an opportunity available to repeat the examination (in case of unsuccessful examination the first time, or for improvement of the grade). These exams will take place in April of the equivalent year for the courses from the first semester and in September for the courses from the second semester.

The first year of graduate studies is considered preparatory. Performance throughout the course of study, including the rotations, journal clubs and other assignments will be evaluated, as well as the overall ability of the M.Sc. student to meet the program requirements will be assessed at the end of the first academic year. The minimum requirement in order to embark into the second year of study is to achieve an average grade $\geq 7/10$ for (i) the Curriculum courses (minimum grade per course ≥ 5) and (ii) the two rotations (the average of (i) and (ii) shall not be offset). If the average grade is below $7/10$ the student may choose to reseat the examination as part of the repeated examination periods for the courses of choice in order to improve his/her grade. The rotations may not be repeated. In case of failure to achieve the minimum grade the SC will decide on whether the M.Sc. student may or may not continue his/her studies.

19. Dissertation project

Each student is required to write a dissertation thesis on a subject relevant to the M.Sc. courses. The student chooses a topic and submits to the SC a written request with the topic and supervisor. The thesis project is supervised by a Three-membered Examination Committee (TEC) consisting of faculty members and Researchers/Lecturers of the M.Sc. program and is approved by the SC. The TEC is responsible for monitoring the M.Sc. student's progress.

The duration of the dissertation thesis is specified to two (2) semesters. If there are special reasons, the SC may decide to grant an extension of the aforementioned period.

20. Presentation of the Dissertation Thesis

The dissertation thesis, which is submitted at the end of the fourth semester, is first approved by the SC and is then defended in public, in an open seminar, before the TEC. Furthermore, the M.Sc. Student is expected to write a research proposal, and to analyze orally and in detail, two research topics that will be defined by the TEC.

With the written confirmation granted by the TEC members, the M.Sc. student will have completed the requirement of the dissertation thesis.

The thesis is accepted by majority and is rated on a scale of 0-10 out of 10. Negative votes are justified in writing. If the thesis is considered by the TEC as unsatisfactory and marked below the base of 7, the Committee may ask the M.Sc. student to improve it by amending certain sections or radically reforming it. In the latter case, the Committee shall appoint a specific time frame in which the thesis should be re-submitted based on requested modifications.

Following the final examination, and under the M.Sc. student's and supervisor's responsibility, a report is prepared and signed by the TEC committee members. The report, the evaluation proceedings and the three replicas of the dissertation thesis are submitted to the School Secretariat who will process the M.Sc. Title award and oath taking.

21. Educational staff

M.Sc. lecturers (regular or visiting), provided they hold doctoral degree, are selected by the SC.

Selection criteria which are additionally accounted for:

- A. Scientific specialization in one of the themes related to the M.Sc.
- B. Scientific responsibility or active engagement in research or programs dealing with topics in the wider scientific field of Molecular Biomedicine and Innovation.
- C. Overall scientific work and practical interest in the subject of the M.Sc.
- D. Previous teaching experience related to the M.Sc.

Scientists or professionals without a doctoral degree but with proven experience and expertise in a specific field within the M.Sc. scope may, by exception, be invited to participate.

Faculty members cannot be exclusively employed for the M.Sc. program purposes.

22. Financial support

M.Sc. students are entitled to all the benefits of undergraduate students, as defined by Laws 1268/82 and 2083/92 (food vouchers, reduced student tickets, reduced participation expenses in certain cultural and entertainment events, insurance through the University, etc.).

M.Sc. students may be financially covered from funded research programs in which they participate.

The M.Sc. program encourages students that may not fall in the aforementioned categories, to obtain external funding for their studies through various Foundations and Institutes.

23. Other Topics

For any other topics related to the M.Sc. in "Molecular Biomedicine - Disease Mechanisms Molecular and Cellular therapies and Bioinnovation" where no provision is taken in this Regulation or in the Decree, relevant decisions will be drawn and appropriate actions will be taken by the SC.

Should there be any discrepancy, this will be resolved under the Greek M.Sc. INTERNAL REGULATION OPERATION HANBOOK, in case there are any slight differences in the current translation.