



האוניברסיטה
העברית
בירושלים
THE HEBREW
UNIVERSITY
OF JERUSALEM

THE M.SC. PROGRAMS OF THE FACULTY OF SCIENCE

GENERAL INFORMATION
THE SCHOOL OF M.SC. STUDIES

The Faculty of Science at the Hebrew University of Jerusalem invites outstanding Bachelor's-degree-level graduates of all scientific disciplines to join the cutting-edge research that is taking place in Jerusalem. As the leading science faculty in Israel and ranked among the top Natural Sciences faculties in the world, students will find an exciting and enriching atmosphere of excellence in an attractive setting that includes state-of-the-art laboratories. Studies toward a thesis-based M.Sc. degree typically focus on comprehensive research under the personal supervision of one of the Faculty's many world-renowned scientists along with high-level advanced courses.

General

The Hebrew University's Faculty of Mathematics and Science offers Master of Science (M.Sc.) programs in the following fields: Physics, Applied Physics, Chemistry, Computer Science, Computer Science and Computational Biology, Mathematics, Statistics, Botany, Cellular and Developmental Biology, Genetics, Brain and Behavioral Sciences, Structural and Molecular Biochemistry, Ecology and Evolution, Bio-Engineering, Hydrology, Geology, Oceanography, Biotechnology, Atmospheric Sciences, Brain Sciences, and Environmental Sciences. A detailed description of select topics appears at the end of this document.

Specializations in the Study of Rationality, Genomics and Bioinformatics, and Nanotechnology are open to students in particular programs.

Eligible candidates are encouraged to contact the relevant Program Head/secretariat to inquire about the requirements and obtain additional information. More information on faculty staff and particular research topics is available online (see below).

Eligibility and Administration

- To be eligible to apply, candidates must hold a B.Sc. (or B.A. or equivalent) degree from a recognized institute in a relevant scientific discipline. The relevance will be evaluated upon registration.
- Candidates may be required to fulfill specific program requirements, including but not limited to, a personal interview or informal meeting.
- Students may be required to take preliminary courses to be eligible for M.Sc. studies in a particular program.
- Eligibility for a particular specialization, as determined by the specialization program, is based on additional criteria, which are updated occasionally (check website for details).
- M.Sc. students are required to pay tuition, unless they hold a teaching assistant position (see 5.2 below). In some cases, the tuition is covered by the research supervisor.

Courses

- Courses are delivered in English if at least one non-Hebrew-speaking student is present.
- Students toward a thesis-based degree are required to successfully complete 30-36 credit points of advanced courses, according to the specific requirements of each program.

Supervisors

- Within a maximum period of one year from the commencement of studies, all M.Sc. students towards a typical thesis-based degree must identify a supervisor from the faculty staff who agrees to guide him/her through his/her research. In some programs finding a suitable supervisor is a prerequisite that must be fulfilled prior to the commencement of studies.
- Collaborative research guided by more than a single supervisor is possible under certain circumstances.

Financial Support

- Under certain circumstances, M.Sc. students are eligible for financial support by means of a fellowship, which is provided either by the school or by the supervisor.
- Outstanding students who demonstrate proficiency in the Hebrew language may receive a teaching assistant position in a suitable Bachelor's program.
- Particularly outstanding students receive incremented fellowships and may be eligible for additional awards and prizes throughout their studies.

Grades and Graduation

- Graduation is conditional upon receiving a passing grade in courses, thesis work, and an oral defense exam.
- Graduation "with distinction" is possible for top students, as determined by the school.

Direct Ph.D. Program

- Outstanding students may transfer to a direct Ph.D. program during their M.Sc. studies. Eligibility is conditional upon past grades in degrees/courses and research activity.
- Transfer to a direct Ph.D. program involves an oral defense examination on the research program.
- Through direct Ph.D. studies, an M.Sc. degree may be awarded based on research progress.
- Ph.D. studies are handled and supervised by the Authority for Research Students (<http://new.huji.ac.il/en/links/801>).

Physics

The Racah Institute of Physics at the Hebrew University is among the leading Physics departments in Israel. Research efforts span nearly all major fields in Physics today, among them: high energy physics and string theory, astrophysics and cosmology, non-linear physics and soft condensed matter, solid state and nanophysics, as well as biophysics. Advanced courses in some of these fields are offered as well.

The M.Sc. program includes two compulsory courses, Quantum Mechanics and Statistical Mechanics; in addition, each student is required to take courses in different fields of Physics, and not only ones related to his/her specific thesis subject. We also offer a special multidisciplinary program in Nanoscience and Nanotechnology that incorporate parallel programs offered by the Chemistry and Applied Physics departments (see below).

Having a supervisor is not a prerequisite for acceptance to the M.Sc. program in physics. However, students are required to find a supervisor, from among the faculty members of the Racah Institute or the Department of Applied Physics, within a year of commencing the program.

Website: www.phys.huji.ac.il/Lectures/index.htm

Contact person: Idit Mor Kline, iditmk@savion.huji.ac.il

Chemistry

The M.Sc. program in the School of Chemistry allows students to acquire advanced knowledge of contemporary Chemistry, while deepening their learning in areas that are of specific interest to them, all in a state-of-the-art setting. The pillar of the M.Sc. program is the research thesis. During the course of the program, students learn how to design and perform independent research work in a critical manner, and how to execute a rigorous experimental plan using sound methodology. They also learn how to process scientific information, from reading and writing papers through database searches to IP protection, acquiring the skills to efficiently deliver scientific information both orally and in writing.

The M.Sc. program is divided into several specialization areas that cover a broad range of areas of modern Chemistry: Theoretical and Physical Chemistry, Applied Chemistry, Analytical Chemistry, Inorganic Chemistry, Organic and Biological Chemistry, Materials Chemistry and Nanotechnology. Students seeking a broader perspective of the whole field may choose courses from different specialization areas and/or disciplines.

In order to be accepted to the M.Sc. program, the candidate must have a B.Sc. or equivalent undergraduate degree in chemistry or a related field. In addition, the candidate must find a supervisor from among the faculty members of the Institute of Chemistry. Once the supervisor has agreed to guide the applicant in his/her M.Sc. studies, the application can be processed.

Website: <http://chemistry.huji.ac.il/school.html>

Contact person: Michal Nave, michalna@savion.huji.ac.il

Life Sciences

The Hebrew University's Institute of Life Sciences offers advanced studies towards master's (M.Sc.) and doctoral (Ph.D.) degrees. In this framework, students participate in advanced and innovative scientific research in a variety of life sciences disciplines: Neurobiology, Biochemistry, Genetics, Evolution and Development, Cellular Biology, Whole Organism Biology and Behavior, Plant and Environmental Sciences. The lion's share of these studies is conducted in laboratories under the direct supervision of the Institute's researchers. Graduate-level courses are designed to prepare the student for a career in biological research. The course schedule is tailored to the specific needs of each student and the program in which s/he is enrolled. Eligible candidates should choose a supervisor from among the Institute's researchers as early as possible during the registration process.

Website: www.bio.huji.ac.il/eng/teaching.asp?cat=236&in=0

Contact person: Keren Daniel, kerend@savion.huji.ac.il

Earth Sciences

The Institute of Earth Sciences is responsible for teaching and research of the entire spectrum of earth science studies, from Geological Sciences (structural geology, geophysics and geodynamics, geochemistry, hydrology, mineralogy and earth materials, paleontology and evolution, geochronology) to Atmospheric Sciences (physics and chemistry of the atmosphere, ocean-atmosphere interaction, chemistry of atmospheric pollution, meteorology) and from Physical Geography (geomorphology, climatology, arid zone ecosystems, pedology, surface processes) to Oceanography (ocean chemistry, physics of the ocean, biological interaction therein, paleo-oceanography).

M.Sc. degrees are offered in Geology, Atmospheric Sciences and Oceanography (the latter division includes faculty members from Life Sciences specializing in Biological Oceanography). Students are required to take 32 credit points, complete a research thesis, which in most cases amounts to a scientific publication, and take a general comprehensive exam. The emphasis in our M.Sc. program is on conducting high-quality research and summarizing this research in a paper worthy of publication in a scientific journal (according to the prevailing standards in the particular discipline). The 32 credits are comprised of courses aimed at broadening the students' general knowledge in their areas of research and specific courses that are necessary as tools for carrying out their focused research, as well as general science courses.

Website: http://earth.huji.ac.il/studies_e.asp

Contact person: Magi Perkin, magip@savion.huji.ac.il

Mathematics

The Einstein Institute of Mathematics accepts into the M.Sc. program Bachelor's graduates in mathematics with a GPA of at least 85, in which their undergraduate studies included the courses Probability I (80420), ODEs (80320), Introduction to Logic (80423), Algebraic Structures 2 (80446), Introduction to Topology (80516), Measure Theory (80517), Functions of a Complex Variable (80519). Candidates who have not taken the entire list of courses, or their equivalents at other institutions, will also be considered; however, they will be required to complete these courses in their first year of studies for the Master's in addition to courses required for the Master's program. In exceptional cases, the department will also consider candidates whose GPA in their first degree was between 80 and 85.

There are two study tracks for a Master's degree in mathematics, namely, research and non-research. The research track requires a minimum of 30 credit points from courses, including at least three "basic notions" courses in at least two distinct topics (out of the three broad areas of algebra, analysis and topology/geometry), as well as participation in a problems workshop, and a thesis written under the supervision of an advisor (usually a faculty member). The non-research track comprises a cohesive program of courses totaling at least 45 credit points, with no thesis. To graduate, the student must pass an oral examination on the course material and elementary (undergraduate) mathematics; in addition, research-track students must give a presentation of their theses.

Website: <http://www.ma.huji.ac.il>

Contact person: Marianna Chizh, mariannac@savion.huji.ac.il

Computer Science and Engineering

The field of computer science is rapidly evolving, and currently touches upon almost every subject at the scientific and technological front, both in industry and academia. The M.Sc. program in Computer Science offers an opportunity to deepen one's knowledge in this field well beyond the limits of expertise obtained in a B.Sc., and to get a taste of original and ground-breaking scientific research in one of dozens of fascinating academic directions.

The program is designed for two years of study. It combines a variety of courses that prepare the student for research or study of a certain subject in depth. The student acquires new analytical tools and a panoramic view of the fundamental conceptual notions of computer science through a variety of courses. In the second year, the student's efforts shift mainly to research, under the guidance of an M.Sc. supervisor. The research provides the student with an opportunity to specialize in a specific field and make an original scientific contribution. At the end of his/her studies, the student is required to submit a final thesis. The School of Computer Science and Engineering offers fellowships to excelling M.Sc. students.

The main research areas in the computer science branch of the school are currently: Design, Analysis and Complexity of Algorithms; Parallel Computer Architecture and Operating Systems; Reliable Distributed Systems; Intelligent Robotic Sensing; Computer Vision, Speech Analysis, Signal Analysis, Pattern Recognition and Robotics; Computer-Aided Surgery and Medical Image Processing; Computer-aided Design; Data Base Design; Artificial Intelligence, Neural Networks and Machine Learning; Computer Networking and Computer Communication; Cryptography and Computer Security; Internet and E-systems; Quantum Communication and Computation; and Biological Systems – Computational Biology. The Engineering Department supports research in Optoelectronic and Microelectronics, as well as Biomedical Engineering. In addition, the school supports interdisciplinary research programs such as Computational Biology and Neural Computation.

Nanotechnology - Specialization

As materials, devices, and other structures shrink in size to length scales of 1 to 100 nanometers, their properties and behavior are further influenced by their size and form as they enter the quantum-realm scale. Nanotechnology is a key feature of the future, and in rising to this challenge the Hebrew University has initiated a Master's degree program with specialization in Nanoscience and Nanotechnology.

Students accepted to the M.Sc. program in Chemistry, Physics or Applied Physics may apply for the specialization in Nanoscience and Nanotechnology. The M.Sc. program reflects the multidisciplinary nature that characterizes research in the various branches of these disciplines, but also retains most of the core program's curriculum (Chemistry/Physics/Applied Physics) as well as the final thesis. The program seeks outstanding students with undergraduate degrees in related fields (Chemistry, Physics, Life Sciences, Engineering, and their combinations), who have the potential, motivation and curiosity to pursue advanced nanoscience and nanotechnology research within a Master's program. Applicants are screened and interviewed. Students accepted to the Nanoscience and Nanotechnology M.Sc. program are offered a fellowship for the program's two-year duration. The program further encourages its participants to continue their research toward a Ph.D. degree, with the possibility of a direct Ph.D. track for select students.

Website: <http://nanoscience.huji.ac.il/mscprograms.html>

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Faculty of Science: <http://science.huji.ac.il/he/students>

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