MSC
MACHINE LEARNING
& DATA SCIENCE
LIVE IN ISRAEL, STUDY IN ENGLISH

EFI ARAZI SCHOOL OF COMPUTER SCIENCE
2019–2020
IDC Herzliya was founded with the aim of nurturing future leaders. In just twenty-five years, we have created a pioneering and innovative academic center. Our students are imbued with a commitment to excellence and original thinking. ‘The university of the future,’ as we see it, has to prepare its students for a constantly changing world, by being able to innovate skillfully, to dare, and to initiate. We believe that the knowledge and tools acquired at IDC support personal and professional goal fulfilment and enable our graduates to tackle the challenges of our global reality.”

Prof. Uriel Reichman
President and Founder,
IDC Herzliya
The Efi Arazi School of Computer Science has built an innovative and intensive M.Sc. program in Machine Learning & Data Science, aimed at providing a deep theoretical and practical understanding of machine learning and data-driven methods. The program will address foundations and techniques, as well as application domains and use cases.

In recent years, data science methodologies have become the bonding language and foundational tools of scientific and industrial research. Machine learning and data-driven methods have developed considerably, and now penetrate almost all areas of modern life. This trend has deeply affected computer-science, medical science, life science and biology, as well as finance, chemistry, physics and social sciences. Gathering, analyzing and interpreting data using modern, data-driven and machine learning methods are now part of the daily routine in many parts of academia and industry alike. Clearly, the vision of a data-driven world presents many exciting challenges to data experts. These include developing algorithms and methods to deal with data, exploiting new cloud-based platforms, deploying and taking advantage of software solutions, and handling information diversity at scale.

To answer the call of the growing market demand for data scientists, the Efi Arazi School of Computer Science has built an innovative and intensive M.Sc. program for students with a strong quantitative background and education. Students will attend frontal lectures, recitations, and seminars, and will produce projects of different scales. Through these projects, students will gain hands-on experience in various data-science and machine learning domains.

The conducive learning environment at the Efi Arazi School of Computer Science provides a community, as well as team-up opportunities, for students, scientists, and researchers from the entire scientific spectrum. The program will expose our students to industry and other activities that parallel their academic training.

Upon completing our M.Sc. program in data science, our graduates will have gained a strong background in the science and technology that form the basis to the growing activity in data analysis, data collection and processing, and related usage. They will have expertise in programming for data science using Python, including skills in using programing in statistical analysis and advanced machine learning. They will have acquired deeper specialization in data science, based on the elective courses of the program: infrastructure courses, Big Data and databases, neural networks and deep learning, statistics, optimization, scientific computing, modern bioinformatics and environmental informatics, computer graphics and vision, numerical analysis, and biomedical data science.

Specializing in Machine Learning and Data Science also requires specification and in-depth treatment in subjects from general computer science.

The program will open a new path for students who do not have a degree in computer science but do have strong mathematical background and programming experience, to become skilled and knowledgeable data scientists. (Non-computer science candidates will need to successfully complete computer science preparatory courses.)

Ultimately, IDC’s Machine Learning and Data Science program, at the School of Computer Science, will endow our students with the knowledge, the market understanding and the scientific and technical skills required to work creatively and effectively in these domains.
Students are required to take 36 credits: 21 credits of mandatory core courses including a final project, 3 credits of an applied data science course, and 12 credits from a list of general computer science electives. Students without a computer science background will need to take an additional 12 credits of preparatory courses.*

**MANDATORY CORE COURSES (16 credits)**
- Probability and Statistics for Data Science and Machine Learning
- Intro to Machine Learning
- Intro to Data Mining, Big Data Platforms and Data Visualization
- Intro to Neural Networks and Deep Learning
- Advanced Machine Learning

**MANDATORY APPLIED DATA SCIENCE ELECTIVES (3 credits)**
- Industrial Applications of Machine Learning
- Bioinformatics
- Computer Vision
- Natural Language Processing
- Image Processing
- Neuromorphic Computing

**ELECTIVE COURSES (12 credits)**

**MACHINE LEARNING AND DEEP LEARNING**
- Advanced Topics in Deep Learning
- Topics in Unsupervised Learning
- Industrial Applications of Machine Learning
- Reinforcement Learning
- Neuromorphic computing

**BIG DATA AND STATISTICS**
- Cloud Computing
- Advanced Big Data Platforms
- Application of Machine Learning on Big Data Platforms
- Advanced Topics in Statistics and Data Analysis
- Probabilistic Graphical Models
- Data Streaming Algorithms and Online Learning

**APPLIED MACHINE LEARNING AND DATA SCIENCE**
- Scientific Computing
- Bioinformatics
- Numerical Analysis
- Computer Graphics
- Computer Vision
- Natural Language Processing
- Image Processing
- Topics in Data Mining and Genomics

**INFRASTRUCTURE AND COMPUTER SCIENCE GENERAL COURSES**
- Distributed Algorithms
- Cryptography
- Advanced Cryptography: Secure Computation
- Network Security
- Advanced Algorithms

**PREPARATORY COURSES FOR NON-COMPUTER SCIENCE GRADUATES**
- Intro to Computer Science and Programming in Python
- Intro to Operating Systems and Databases
- Data Structures, Algorithms and Complexity

**MANDATORY FINAL PROJECT (5 credits)**
- Final Project: Independent research and development with industry collaboration. Can be extended to a thesis.

*Course list subject to change
Raphael Recanati International School is celebrating its 18th year.

IDC HERZLIYA

FAST FACTS

Over 27,000 graduates worldwide

The Israel Council for Higher Education granted IDC permission to confer doctoral degrees

Over 30 research institutes at IDC

On the way to becoming Israel’s first private university

Over 2,000 Raphael Recanati International School students from over 86 countries make up 1/3 of the IDC student body.

The Career Center aims to assist alumni in integrating into the professional market, as well as to assist employers who are seeking to recruit suitable candidates.

www.idc.ac.il/career/eng
IDC: THE MOST INTERNATIONAL UNIVERSITY IN ISRAEL

IDC has created new, academic interdisciplinary concepts in the fields of entrepreneurship, counter-terrorism and sustainability - these models are being implemented around the world.

IDC’s Alumni Association with over 25,000 graduates, forms a professional and social alumni community that promotes networking from different countries, and strengthens the pride and belonging to IDC and the alumni.

Over 200 Lone Soldiers studying for full degrees.

Ranked no. 1 in Israel for our treatment of IDF reservists.
APPLICATION PERIOD

The application period for the academic year starting autumn 2019 is **January 1, 2019 - September 15, 2019**.

The application period for students required to take preparatory courses ends on **July 15, 2019**.

Due to the competitive nature of the admissions process, we recommend that applicants prepare their application well in advance of the deadlines. IDC Herzliya reserves the right to impose stricter criteria upon applicants during the late application period or upon applicants who submit material late. Preference will be given to applicants who submit all required material during the regular application period.

ADMISSION CRITERIA

- Completed undergraduate degree from a recognized academic institution
- One of the following: B.Sc. in Computer Science, with a GPA of at least 85% or a B.Sc. in a quantitative non-computer science or a life science (including, but not limited to: Physics, Chemistry, Biology, Statistics, Math), with a GPA of at least 80%
- Prerequisite courses are required in Linear Algebra A+B, Calculus A+B, and Probability Theory
- Non Computer Science students will be required to take the preparatory classes, as indicated above
- The academic program of the Raphael Recanati International School is taught entirely in English. Graduates of schools in which English was not the primary language of instruction are required to pass the TOEFL (Test of English as a Foreign Language) or an equivalent test, such as the IELTS (International English Language Testing System) or the Israel Psychometric Examination.

ONLINE APPLICATION

- Complete the online application form, including essays, recommendation letters, transcripts, and documents at [https://forms.idc.ac.il/#/Public/Registration?lang=en&form=MA](https://forms.idc.ac.il/#/Public/Registration?lang=en&form=MA)
- Official transcripts of previous academic studies (undergraduate or graduate degrees), including a final GPA. Documents may be scanned and/or originals may be submitted. The documents must bear an official stamp from the issuing institution. Scanned photocopies of the original documents will be accepted only if properly notarized. *
- Copy of passport or identity card
- Curriculum Vitae (CV)
- Candidates may be interviewed

* An official, notarized English translation must be submitted for all transcripts not originally issued in English.

TUITION & FEES

- The application fee is **$100 US** (non-refundable)
- The down payment is **NIS 8,000**. Applicants must pay this fee to secure their place in the program after being accepted. Once the down payment has been received the applicant’s place is secured and confirmed.
- The tuition for the entire M.Sc. in Machine Learning & Data Science is **NIS 60,000** without prerequisites, or **NIS 70,000** with prerequisite courses.

  *If payment is in Israeli shekels, the value in shekels will be determined according to the exchange rate on the day that payment is received.*

IDC reserves the right to change all tuition and fee rates without prior notice.

APPLY ONLINE AT
[Forms.idc.ac.il/MA](https://forms.idc.ac.il/MA)
STUDENT AUTHORITY
The Government of Israel offers financial assistance for graduate school tuition to new immigrants under the age of thirty, provided they do not already have a graduate degree from abroad and that their program of choice is recognized by the Student Authority. Students must begin their graduate studies within three years of their aliyah date (not including army service), in order to be eligible for this assistance.

For more details about conditions of eligibility and the application process please visit:
www.gov.il/en/Departments/General/students_eligibility

MASA
Students up to the age of thirty who have not previously been on a long-term program to Israel are eligible for a one-time grant from Masa towards tuition.
www.masaisrael.org

FOR MORE INFORMATION
ldc.ac.il/financialaid/ma
THE CITY OF HERZLIYA

IDC is located in Herzliya, a city five miles north of Tel Aviv along the Mediterranean coast. Herzliya is an ideal location for students, as it is located in the center of the country, and you can get either trains or buses to most areas in Israel. The IDC campus is in a residential neighborhood - leafy, quiet streets with all the required amenities. Herzliya has malls, restaurants and pubs, concert halls, a downtown outdoor street mall with cafes and shops, parks and recreational facilities - including jogging and bicycle paths and, of course, a beautiful white sand beach.

For more information www.herzliya.muni.il

LIVING ARRANGEMENTS

IDC Herzliya students have the option of enjoying a high standard of living in 500 new, fully-equipped residential units located in two thirteen-story towers on IDC Herzliya’s campus. The apartments are fully furnished to accommodate all residents’ needs. Each unit has air conditioning and a private bathroom with a shower. In addition, laundry rooms with washing machines and dryers are at the residents’ disposal.

A skilled and experienced professional staff maintains the dormitories, and staff members are on hand to help students on a daily basis. Security services operate 24/7. The housing fee includes: WiFi throughout the entire building; municipality fees; maintenance; gardening; cleaning of public areas; and security. It does not include electricity or water. The dormitory towers were planned and designed to meet green building standards, as well as all of the students’ needs. Every floor has study areas to enable students to focus on their studies and to maintain a varied social life.

E-mail any questions regarding the dorms to dorms@idc.ac.il
CAREER CENTER

The Career Center at IDC Herzliya aims to prepare students and alumni for the modern job market by providing them with the tools and resources to find employment both before and after they graduate. The Career Center serves as a bridge between the educational and the professional periods in the lives of IDC Herzliya students and alumni and offers a variety of networking, career counseling, placement and informational services to IDC Herzliya students and alumni enabling them to meet their career goals.

HEALTH INSURANCE

All IDC students are required to have comprehensive health insurance coverage throughout the period of their studies. Israeli residents, including new immigrants, receive national health insurance for a low monthly fee in accordance with the country’s health insurance legislation. International students who are not covered by Israel’s national health insurance (bituach leumi) should purchase their own health insurance policy to cover their medical needs while in Israel, or purchase the UMS HAREL YEDIDIM insurance policy for international students, offered by IDC.

Our special arrangement with HAREL YEDIDIM insurance company provides comprehensive health coverage for $930 US* per academic year, which will be charged at the beginning of each year.

*Rates are subject to change according to insurance company rate fluctuations.

VISA & STATUS ASSISTANCE

Students are responsible for clarifying and establishing their status in Israel and can turn to the Raphael Recanati International School staff for advice and assistance. Before commencing studies, all students must clarify their status and eligibility for a student visa (A-2) or Israeli citizenship with the Israeli embassy or consulate in their country of origin. A student visa should be obtained in advance in the student’s country of origin. International students who are children of an Israeli parent must settle all matters, such as deferment of military service, with the nearest Israeli embassy or consulate.

The Jewish Agency provides advice and assistance to students considering immigrating to Israel. See www.jewishagency.org/JewishAgency/English/Aliyah/ and for North America/UK www.nbn.org.il
30% of the student population of IDC Herzliya are international students. RRIS is the largest academic absorption center in Israel.
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<td>October 27, 2019 - November 1, 2019</td>
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<tr>
<td>Fall Semester Begins</td>
<td>November 3, 2019</td>
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<td>Memorial Day for Yitzhak Rabin</td>
<td>November 10, 2019</td>
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<td>Hanukkah Vacation</td>
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<td>Fall Semester Ends</td>
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<td>Passover Vacation</td>
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<tr>
<td>First Day of School After Passover Vacation</td>
<td>April 19, 2020</td>
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<tr>
<td>Eve of Holocaust Memorial Day</td>
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<tr>
<td>Holocaust Memorial Day Ceremony</td>
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<td>Israel Memorial Day Ceremony</td>
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<td>Eve of Israel Memorial Day</td>
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<tr>
<td>Israel Memorial Day</td>
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<td>Shavuot Vacation</td>
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Schedule is subject to change.
Submit your application online:
https://forms.idc.ac.il/#/Public/Registration?lang=en&form=MA

www.rris.idc.ac.il

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