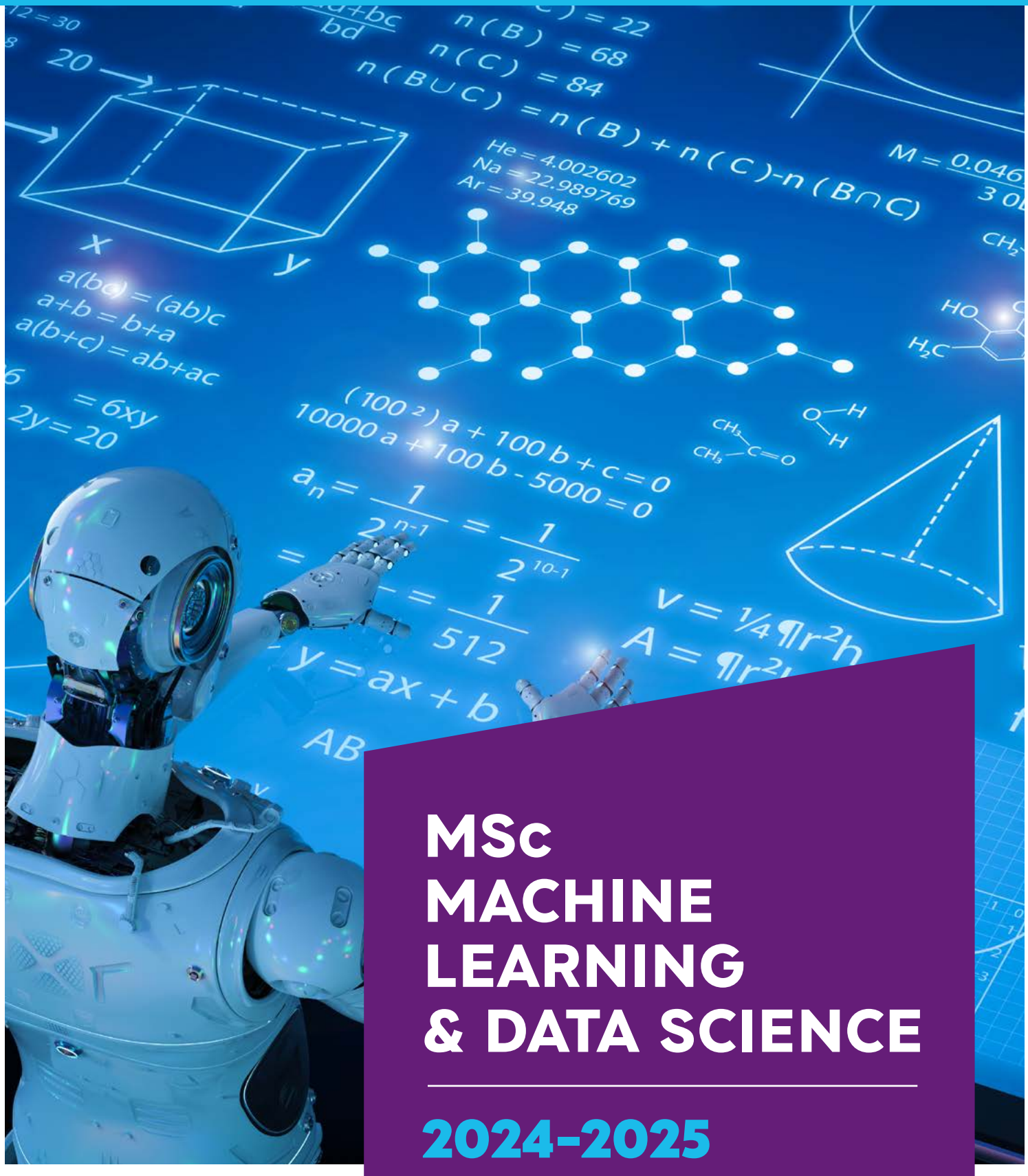
Reichman University
Raphael Recanati International School

LIVE IN ISRAEL, STUDY IN ENGLISH

## EFI ARAZI SCHOOL OF COMPUTER SCIENCE



# MSc MACHINE LEARNING & DATA SCIENCE

## 2024-2025

# CONTENTS



"Reichman University was founded with the aim of nurturing future leaders.
In 30 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 Reichman University support personal and professional goal fulfillment and enable our graduates to tackle the challenges of our global reality."

**Prof. Uriel Reichman**
Founding President and Chairperson of the Board of Directors, Reichman University

# PROGRAM

The Efi Arazi School of Computer Science has built an innovative and intensive MSc 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 sciences, 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, as well as communicating, interpreting, and leveraging the results obtained through analysis pipelines and processes.

To answer the call of the growing market demand for data scientists, the Efi Arazi School of Computer Science is offering a unique MSc program for students with a strong quantitative background and education. Students will attend frontal lectures, recitations, and seminars, and will lead and participate in projects of different scales. Through these projects, students will gain hands-on experience in various data science and machine learning domains. Project participation will be in collaboration with academia, both internally and externally, and with industry and the public sector.

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.

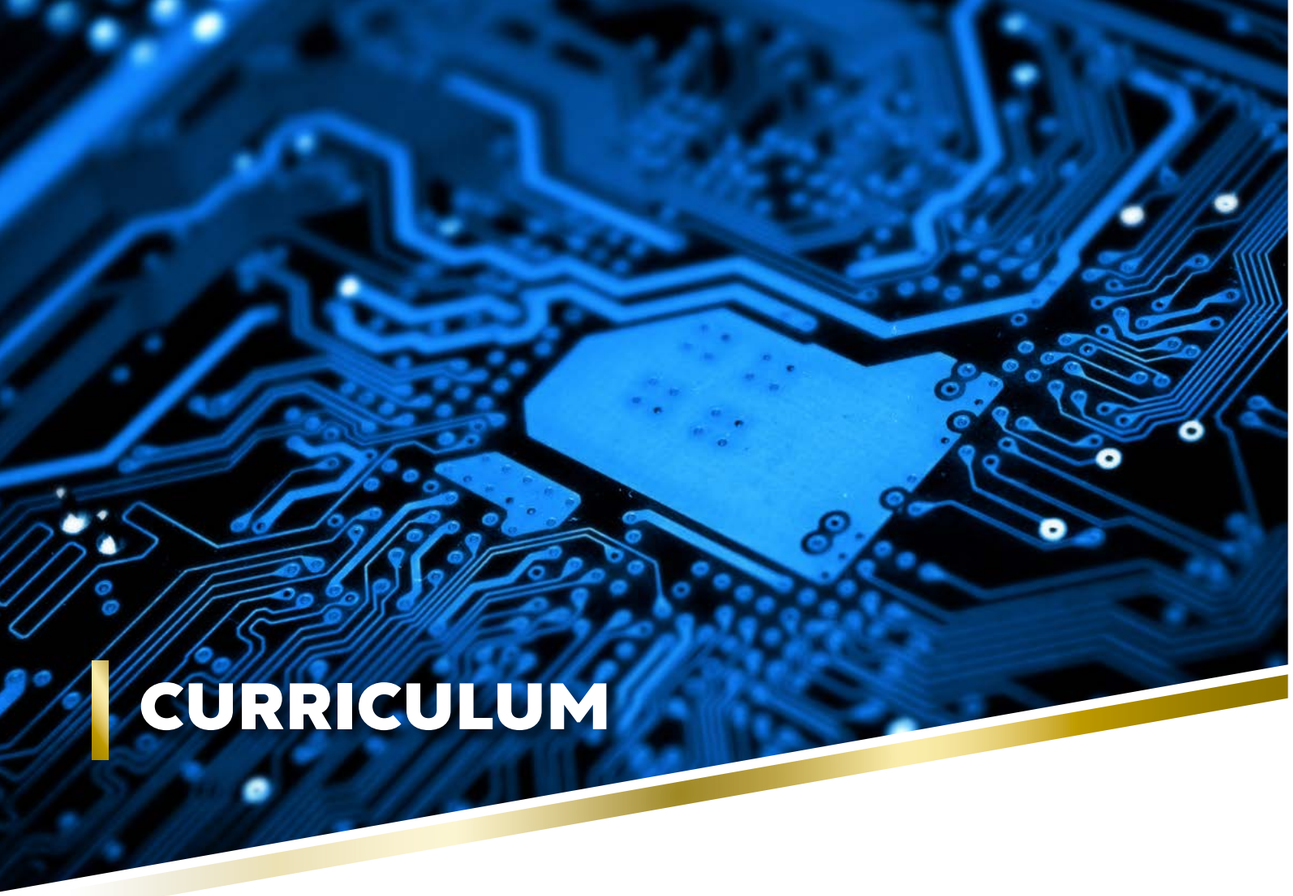


Upon completing our MSc program, our graduates will have gained a strong background in the science and technologies that form the basis to the growing activity in data analysis, data collection and processing, and related usage. They will have expertise in programming for data science using Python, including skills in using programming in statistical analysis and 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.

The program also opens a new path for students with a strong mathematical background and programming experience, but without a Computer Science degree. It will provide these students with the opportunity to become skilled and knowledgeable data scientists. (Candidates without Computer Science degrees will need to successfully complete Computer Science and possibly advanced mathematics preparatory courses.)

Ultimately, Reichman University's Machine Learning & Data Science program, at the School of Computer Science, will endow our students with the knowledge, market understanding, and scientific and technical skills required to work creatively and effectively in these domains.

The Efi Arazi School of Computer Science has built an innovative and intensive MSc program in Machine Learning & Data Science, aimed at providing a deep theoretical and practical understanding of machine learning and data-driven methods.



# CURRICULUM

Students are required to take 36 credits: 21 credits of mandatory core courses including a final project, three credits of mandatory electives, and 12 credits from a list of general computer science electives. Any student with an insufficient background in either computer science or math will be required to take additional preparatory courses, to be determined by the Admissions Committee. All mandatory courses, and some elective courses, are taught in English. Some elective courses may be taught only in Hebrew.

## MANDATORY CORE COURSES (16 credits)

- Statistics & Data Analysis
- Intro to Machine Learning
- Intro to Big Data Platforms & Data Visualization
- Intro to Neural Networks & Deep Learning
- One of the following advanced courses:
  - Advanced Machine Learning
  - Advanced Statistics
  - Advanced Algorithms

## ELECTIVE COURSES (15 credits)

Students are required to take at least three credits from the highlighted courses below. It is possible, and even recommended, to take more.

**MACHINE LEARNING AND DEEP LEARNING**

- Advanced Topics in Deep Learning
- Recommendation Systems
- Data Streaming & Online Algorithms
- Advanced Topics in Machine Learning
- Unsupervised Learning Methods
- Intro to Reinforcement Learning

**BIG DATA AND STATISTICS**

- Cloud Computing
- Advanced Big Data Platforms
- Application of Machine Learning on Big Data Platforms
- Advanced Topics in Statistics & Data Analysis

**APPLIED MACHINE LEARNING AND DATA SCIENCE**

- Scientific Computing
- Bioinformatics
- Numerical Analysis
- Computer Graphics
- Computer Vision
- Natural Language Processing
- Image Processing
- Topics in Data Mining & 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 & Programming in Python
- Intro to Operating Systems & Databases
- Data Structures, Algorithms & Complexity
- Linear Algebra for Data Science

## MANDATORY FINAL PROJECT (5 credits)

- Final project: Independent research and development with industry and/or academic collaboration. Can be extended to a thesis.

*Reichman University reserves the right to cancel, alter, or expand the academic programs offered.*

# REICHMAN UNIVERSITY

## FAST FACTS

Israel's
first and only
**private university**

Over **38**
**research institutes**
at Reichman University
www.runi.ac.il/research-institutes

Over **38,000**
**graduates worldwide**

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

The Israeli Council for Higher Education granted Reichman University permission to confer
**doctoral degrees**

Over **2,500**
Raphael Recanati International School students from over
**90** countries make up 1/3 of the Reichman University student body



# REICHMAN UNIVERSITY: THE MOST INTERNATIONAL UNIVERSITY IN ISRAEL

Reichman University created new, academic
**interdisciplinary concepts** in the fields of entrepreneurship, counter-terrorism and sustainability - models that are being implemented around the world

Over **400** lone soldiers studying for full degrees

**Reichman University's Alumni Association,**
with over 38,000 graduates, forms a professional and social alumni community that promotes
**networking** from different countries, and strengthens the pride and sense of belonging to Reichman University and its alumni

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

# APPLICATION, ADMISSION, TUITION

## APPLICATION PERIOD

The application period for the 2024-2025 academic year is **November 15, 2023 - August 31, 2024**.

The application period for students required to take preparatory courses ends on **June 30, 2024**.

Due to the competitive nature of the admissions process, we recommend that applicants prepare their application well in advance of the deadlines. Reichman University 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.

## CRITERIA FOR CONSIDERATION BY THE ADMISSIONS COMMITTEE

- Completed undergraduate degree from a recognized academic institution
- One of the following:
  - BSc in Computer Science, with a GPA of at least 85%
  - BSc in other fields, with a GPA of at least 90%
- Non-Computer Science students will be required to take the following three preparatory classes: Introduction to Computer Science and Programming in Python; Data Structures Algorithms and Complexity; Introduction to Operating Systems and Databases.
- Students with an insufficient quantitative background will be required to complete the following prerequisite courses: Linear Algebra for Data Science; Calculus A/B; Probability Theory.
- 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.

TOEFL www.toefl.org
IELTS www.ielts.org

## ONLINE APPLICATION

Please note your application must include:

- Official transcripts of previous academic undergraduate and graduate studies. Transcripts must bear the official stamp of the issuing institution. If you do not send the original transcript, scanned photocopies of the original documents will be accepted if properly notarized.*
- Copy of passport or identity card
- Curriculum Vitae (CV)

Note that candidates may be interviewed.

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

## TUITION & FEES

- The application fee is **NIS 300** (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 MSc in Machine Learning & Data Science is **NIS 74,200**. Prerequisite courses are charged separately, based on the specific course plan for each student.

  *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.*

*Reichman University reserves the right to change all tuition and fee rates without prior notice.*

### APPLY ONLINE AT

**https://forms.runi.ac.il/#/Public/Registration?lang=en&form=MA**



# FINANCIAL AID

## GRANT FOR NEW IMMIGRANTS

The State of Israel offers financial assistance for graduate school tuition to new immigrants under the age of 30, 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:
https://www.gov.il/en/Departments/Units/students_authority_maya

## FREE APPLICATION FOR FEDERAL STUDENT LOANS (FAFSA)

US citizens are eligible to apply to borrow FAFSA Stafford loans as part of the Direct Loans Programs and/or Sallie Mae. For students enrolled in the 2024-2025 academic year, the deadline to apply for loans is **April 1st, 2025**. Our school code is G40703, and the school name is Raphael Recanati International School. For further information and to start the process, please contact Rina Haller in our US office at Rina@aforu.org.

## MASA

Jewish tourists between the ages of 18-30 who have not been in Israel on a prior long-term program are eligible for grants and scholarships through the Masa Project.
Please note: once you make Aliyah you are not eligible for this grant so please check this before making Aliyah!
More information at: www.masaisrael.org

masa מסע
ISRAEL JOURNEY

**FOR MORE INFORMATION:**

**https://www.runi.ac.il/en/schools/rris/admissions/graduate/financial-aid-and-scholarships/**

Networking is the name of the game!
To date, there are more than 38,000 Reichman University graduates from over 90 countries. This gives students a unique opportunity to meet people from different backgrounds and learn about other nations and cultures, and to establish friendships that last a lifetime. This also creates a global network that provides our graduates with an advantage throughout their professional career.

Our small classes create a more intimate learning setting, which allows students to get to know each other and the staff. Our philosophy is that our students are our partners.

Reichman University is one of the most prestigious universities in Israel. Employers seek Reichman University graduates because they come with practical tools and hit the ground running. Reichman University operates a Career Development Center that aims to prepare students and alumni for the job market, and to provide them with the tools to find suitable employment both before and after they graduate.

# WHY REICHMAN UNIVERSITY ?

Reichman University was ranked number one in student satisfaction for quality teaching for four consecutive years, in a nationwide survey conducted by Israel's Council for Higher Education. We are the first non-government-subsidized academic institution to grant doctoral degrees.

Reichman University offers a wide range of extracurricular activities: sports, debate club, Model UN, Israel advocacy, JLIC-RRIS Friday night dinners, shiurim, mincha club, choir, band, and much more.

The Raphael Recanati International School provides very special care for its students. We are the largest academic absorption center in the country. We are especially proud that we are home to more than 400 lone soldiers, who are currently studying here.

1/3 of Reichman University students are international, making us the most international university in Israel for full-degree students. Israeli students serve as counselors for first-year students in order to help them find their way around and get to know the system.



## 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. All students must clarify their status and eligibility for a student visa (A-2), or Israeli citizenship, in advance before arriving to Israel, with the Israeli embassy or consulate in their 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.
For students considering immigration to Israel, the Jewish Agency provides advice and assistance:
**www.jewishagency.org/Aliyah/**, and for North America/UK: **www.nbn.org.il**

## CAREER CENTER

The Career Center strives to prepare students to enter the workplace and help them find employment opportunities by providing counseling, placement, and informational services. It is tailored to meet the specific needs of the students and graduates of each of Reichman University's schools, according to the relevant market. These services include personal career counseling and assistance, including one-on-one LinkedIn sessions, as well as lectures and workshops on job-seeking strategies, LinkedIn, and interviews. In addition, the Career Center creates recruitment and networking opportunities such as job fairs and employer meetings. The center also maintains an updated listing of hundreds of job openings in Israel for students and graduates.

**www.runi.ac.il/career/eng**

## HEALTH INSURANCE

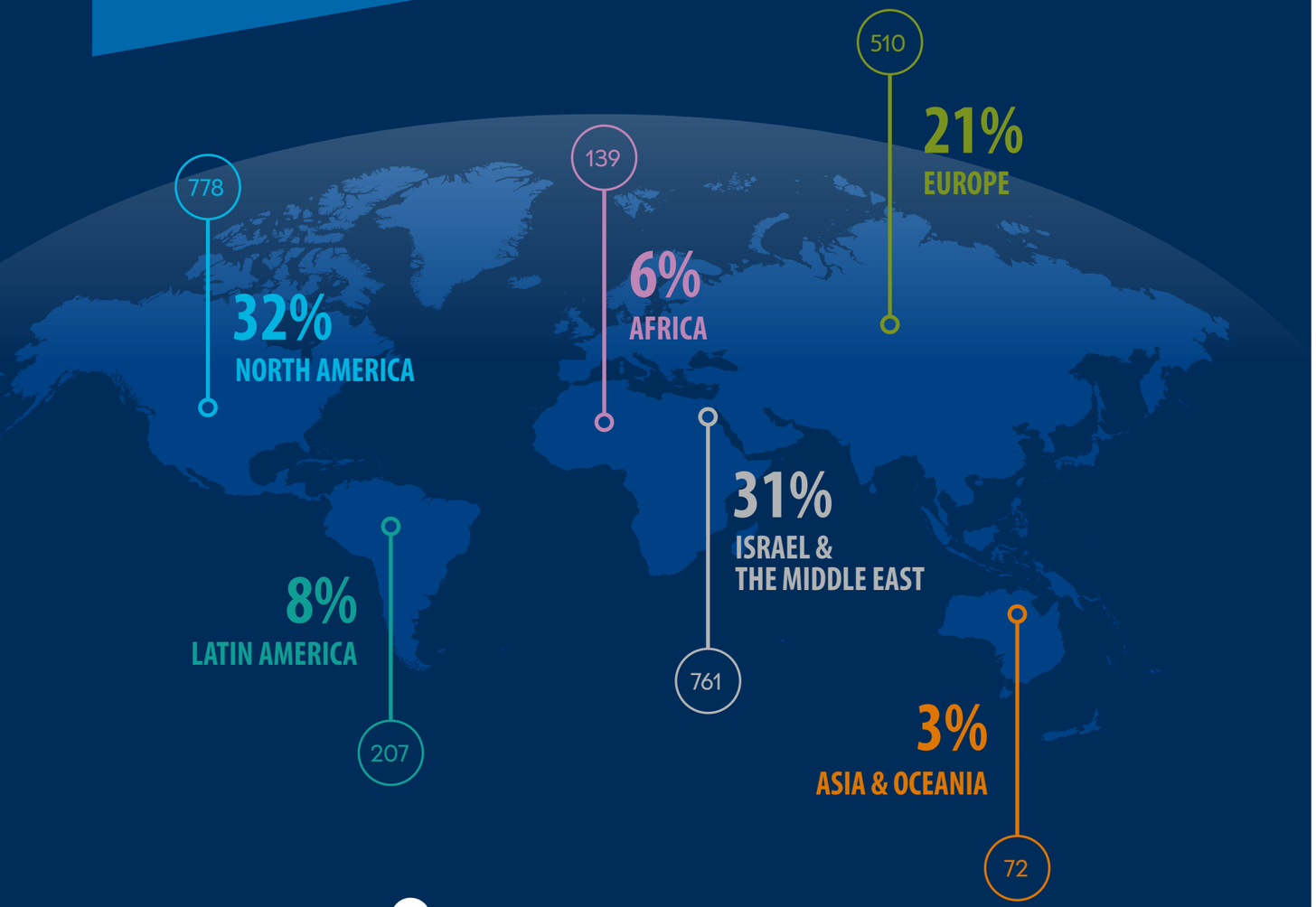
All Reichman University students are required to have comprehensive health insurance coverage throughout the duration of their studies. Reichman University cannot cover medical costs or take responsibility for students who do not have insurance. You may purchase your own health insurance policy to cover your medical needs while in Israel, or purchase the UMS HAREL YEDIDIM insurance policy for international students, offered by Reichman University (RUNI). If you are an Israeli resident covered by Israel's National Health Insurance (Bituach Leumi), you do not need any additional health insurance. The insurance plan with HAREL YEDIDIM provides comprehensive health coverage for *$1,600 USD per academic year, which will be charged at the beginning of the year. In order for students to have continuous coverage, the HAREL YEDIDIM policy will be automatically renewed from one academic year to the next, until the end of the program, unless the student notifies the school in writing that they have an alternative health insurance and wishes to cancel.

Please note that the HAREL YEDIDIM health insurance plan does not cover pre-existing conditions.

For more information: **rris.insurance@runi.ac.il**

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

# RRIS GLOBAL VILLAGE




**30%**

**OF THE STUDENT POPULATION OF REICHMAN UNIVERSITY ARE INTERNATIONAL STUDENTS.**
**RRIS IS THE LARGEST ACADEMIC ABSORPTION CENTER IN ISRAEL.**



# ACADEMIC CALENDAR 2024-2025 ה'תשפ"ה

| | |
|---|---|
| Orientation week | October 27 - November 1, 2024 |
| **Fall semester begins** | **November 3, 2024** |
| Memorial Day for Yitzchak Rabin z"l | TBD |
| Hanukkah vacation | December 29, 2024 |
| **Fall semester ends** | **Janurary 31, 2024** |
| Fall exams begin | February 2, 2025 |
| **Spring semester begins** | **March 23, 2025** |
| Passover vacation | April 7-20, 2025 |
| Studies resume | April 21, 2025 |
| Eve of Holocaust Memorial Day | April 23, 2025 |
| Holocaust Memorial Day ceremony | April 24, 2025 |
| Eve of Israel Memorial Day | April 29, 2025 |
| Israel Memorial Day | April 30, 2025 |
| Israel Independence Day | May 1, 2025 |
| Shavuot vacation | June 1-2, 2025 |
| Graduation ceremony | TBD |
| Honorary Fellowship & Outstanding Researchers and Lecturers Ceremony | TBD |
| Student Day | TBD |
| **Spring semester ends** | **July 4, 2025** |
| Spring exams begin | July 6, 2025 |
| **Summer semester begins** | **TBD** |
| Logistics weekend | TBD |
| **Summer semester ends** | **TBD** |

* The schedule is subject to change.

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Raphael Recanati International School


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