Braude College is perched on a hill in the city of Karmiel, which divides the upper and lower Galilee. The Galilee is a mountainous region in the north of Israel, characterized by rocky hills, green fields, and colorful wildflowers. Its relatively abundant water and fertile soil have made for thriving wildlife and thousands of years of human settlement.

The Galilee houses a tapestry of ethnic communities. Alongside Jewish cities and towns, are Arab, Druze, and Circassian villages. A hub of tourism, the Galilee offers antiquities parks, nature reserves, and religious sites. The Galilee is also a center of arts and culture, and of industry. Numerous high-tech companies are located here, having drawn some of Israel’s finest scientists to the region. The natural beauty, historical and archeological sites, cultural diversity, and innovative industries make the Galilee a fascinating region, with something to interest almost any visitor.

From the hilltop of Mount Scopus, the Hebrew University looks out over the spectacular panorama of Jerusalem. A city sacred to Judaism, Christianity, and Islam, Jerusalem is a blend of past and present, ancient roots and modern innovations.

Jerusalem is well known for its abundant historical and holy sites, and fascinating tourist attractions. A thriving metropolis, Jerusalem is dotted with art galleries and museums, theaters and concert halls, archaeological sites and religious shrines. Throughout the year, the city hosts exciting festivals, exhibitions, international conferences, and other special events.

As the capital of Israel, Jerusalem is not only the home of the country’s governing bodies, national memorials and cultural institutions, but also a political center of national and international significance.
The Hebrew University of Jerusalem is a multidisciplinary institution of higher learning and research, and a scientific center of international repute. Ranked among the world’s leading universities, the Hebrew University stresses excellence throughout its Faculties of Humanities, Social Sciences, Law, Mathematics and Sciences, Medicine, Dental Medicine and Agriculture, Food and Environment. The university has 22,000 undergraduate, graduate and doctoral students. Its 1,200 faculty members and alumni have been awarded numerous national and international prizes, including the Nobel Prize. In 1955 the Hebrew University opened its first program for international students with 22 American students. Since then, the programs and courses for students from abroad have steadily expanded. Today, the Rothberg International School attracts more than 2,000 students annually, from over 75 countries around the globe.

Braude College, based in the city of Karmiel, is a leading engineering institution in northern Israel. Established in 1987, the beautifully landscaped college has about 2,900 undergraduate and graduate students.

An academic, technological and scientific center in the Galilee, Braude College helps develop local high-tech industries.

Braude College offers B.Sc. degrees in biotechnology engineering, electrical and electronic engineering, industrial engineering and management, information systems engineering, mechanical engineering, software engineering, applied mathematics and optical engineering. The college confers M.Sc. degrees in biotechnology, software engineering, industrial engineering and systems engineering.

At Braude College, each student is valued, and receives personal attention from faculty and staff. Students also benefit from the college’s connection with top-ranking industries.
Jerusalem-Galilee Engineers is an innovative new program offered by the Hebrew University of Jerusalem and Braude College. The semester-long program, conducted in English, is designed for engineering students in their third or fourth year of studies. Participants take accredited courses in engineering and other academic subjects. Ample opportunities are available to become acquainted with the vibrant, multifaceted State of Israel, and its people.

The program begins with a two-week mini-semester at the Hebrew University of Jerusalem where students take an introductory course in Israeli Society. The course includes stimulating study tours throughout Jerusalem and other parts of the country.

The program continues in Karmiel, the "capital" of the Galilee, at Braude College. At this topnotch technological institution, students study engineering courses for 16 weeks. They also take part in the unique Study in Advanced Industry program, in which they visit leading high-tech companies.
Spring Semester in the Galilee at the Braude College

The spring semester comprises 16 weeks, from March to July. Students benefit from an expert faculty, strong support network, small study groups, and personal attention. Required projects related to leading Israeli companies expose students to real-world engineering challenges and valuable professional contacts.

Braude College combines theory with practical laboratory experience and contact with industry.

The engineering program offers the following courses:

Jerusalem-Galilee Engineers

The program is divided into two sections:

> Mini-Semester at THE HEBREW UNIVERSITY OF JERUSALEM

The program will begin in Jerusalem, with a two-week mini-semester designed to introduce the students to Israeli society and culture. Students will participate in the following course:

**Introduction to Israeli Society**

- Academic hours: 30
- Academic credits: 2
- Tuition: US $1250

This course examines historical, social and political aspects of contemporary Israeli society. After analyzing the ideologies and groups that played a major role in the formation of Israeli society, class discussion will focus on social and political issues which are at the center of current debate in the country.

> Spring Semester in the Galilee at the BRAUDE COLLEGE

The spring semester comprises 16 weeks, from March to July. Students benefit from an expert faculty, strong support network, small study groups, and personal attention. Required projects related to leading Israeli companies expose students to real-world engineering challenges and valuable professional contacts.

Braude College combines theory with practical laboratory experience and contact with industry.

The engineering program offers the following courses:

Students will enjoy an extensive series of stimulating academic field trips and extra-curricular activities, offering an enriching social and academic experience through which students can experience Israeli society and culture firsthand.
Machine Learning
Academic hours: 42
The course deals with Machine Learning concepts. Among other topics, the course covers major models in the field: Supervised Learning, Reinforcement Learning, and Un-supervised Learning. Students will also be exposed to linear models including: SVM, Rule Learning and Distance Base Models.

Topics in Algorithmic Game Theory
Academic hours: 42
Game theory deals with the analysis of strategic situations which involve players with conflicting goals, and attempts to answer questions such as what is the best strategy for each participant and how to predict the outcome of a given game. The purpose of the course is to review a variety of topics related to the encounter between three fields: economics, game theory and computer science. The course will include lectures that develop the relevant theory and discuss the related practical applications. The course begins with a short introduction to game theory. We will then review a variety of classic topics and contemporary issues.

Algorithms Design
Academic hours: 42
Algorithm design is a specific method for creating a mathematical process in solving problems. Techniques for designing and implementing algorithm design include: problem definition, development of a model, specification of algorithm, designing an algorithm, checking the correctness of algorithm, analysis of algorithm, implementation of algorithm, program testing, documentation preparation. The course will include lectures, workshop and presentations by students.

Modern Physics
Academic hours: 56
An introductory course to the field of modern physics, designed as a general overview for engineering students. The course includes the following topics: basics of geometrical optics, optical devices, wave theory, blackbody, radiation, photons, an introduction to quantum theory, principles and concepts of modern physics, applications of modern physics in various engineering fields, and applications of modern physics, in particular in biotechnology. Another topic in the course focuses on understanding of the process of constructing a scientific theory: induction and deduction.

Industrial Automation
Academic hours: 70
In this introductory course, students learn about automation technologies and manufacturing systems. The rationale for utilizing automation is explored, along with the advantages of both hardware and software-based automation. Laboratory experience is also included in the course.
Light Sources and Lasers
Academic hours: 56
This course covers the fundamental physical processes of lasers, introduces relevant engineering, and explores a variety of specific laser systems. In the first part of the course, the principles and main features of black body radiation and incoherent sources are introduced. The main part of the course focuses on the physical principles, structure, and operation modes of optical lasers. Topics include absorption/emission and optical gain, population inversion in three and four-level systems, laser oscillator, resonator and beam propagation, modes structure and methods of mode-selection, Q switching, and phase locking. In addition, laser applications are addressed. The course also includes relevant exercises and solutions for technical problems undertaken in the practical sessions.

Optical Imaging Systems
Academic hours: 42
This course covers the basic principles of optical imaging systems. Starting from the fundamentals of the diffraction theory of light, the main features, limitations, and engineering aspects of imaging systems are covered. Topics include diffraction-limited imaging, optical modulation function and modulation contrast function, contrast-limited resolution and target acquisition, and noise-limited imaging and target acquisition. In addition, the effects of atmosphere, turbulence, and motion on image quality are treated. Furthermore, the structure and main characteristics of imaging devices are covered. In the practical sessions, relevant exercises on imaging systems characterization and design are solved.

Interferometry and Interferometric Microscopy
Academic hours: 42
The course covers the following topics: wave optics, interferometry as the most accurate ruler in nature, and an overview of the Michelson Interferometer: from special relativity to the LIGO Interferometer, two-wave Interferometry, additional Interferometers, holography, coherence, and alignment of an interferometer.

Manufacturing Processes
Academic hours: 42
This course looks at manufacturing technologies from the shop floor perspective, along with professional literature, scientific/academic and trade magazines and technical databases. Students use analysis tools and decision-making methodologies to optimize production lines, and suggest manufacturing layouts and solutions for commercial/industrial systems.

Study in Selected Advanced Israeli Industries
Academic hours: 56
This course introduces students to leading industries in Israel, stressing industries unique to the country, and those that are especially developed here. The course will cover technology, manufacturing engineering practices and business considerations, and will include field trips to relevant plants.

Transport Phenomena Laboratory
Academic hours: 28
In this course the student practices knowledge related to fluid mechanics and heat transfer, with emphasis on tools and measurement techniques. The lab sessions include experiments in flow rate and regimes, pressure drops in pipes and devices, heat transfer (conduction, convection, and radiation), pumps, wind tunnel, and heat exchange systems.

Strength and Materials Laboratory
Academic hours: 28
The aim of this course is to teach the student experimental techniques, design of experiment, correct procedures of experimental work, result analysis, and presentation of the process and results. The course includes the following topics: torsion, hardness of materials, stress and strain, bending, stress concentration, thermal treatment and aging of metals, manual and computer aided and automated geometrical measurements.

Advanced Materials Engineering
Academic hours: 28
The goal of this course is to expose the student to advanced topics of materials engineering. The student will gain knowledge and techniques for applying materials engineering principles in order to solve engineering problems and to estimate the influence of various processes on the mechanical properties of certain groups of alloys. Another important aspect of the course is to understand the connection between microstructural phenomena and the mechanical behavior of materials. At the end of the course, the students will present a research problem and its investigation process.
Biomaterials
Academic hours: 70
The biomaterials course is intended to introduce the students to the uses of artificial/synthetic materials in the human body for the purposes of aiding healing, correcting deformities, and restoring lost function. The course reviews basic concepts of chemical bonds, materials structures and the resulting chemical and physical properties of metals, ceramics, polymers and composite materials.

Rehabilitation biomechanics
Academic hours: 42
The course surveys the field of rehabilitation engineering with an emphasis on human machine interface, sensory physical and cognitive applications, while implementing existing technologies. The course reviews different rehabilitation systems and design essentials of these systems. The course provides insight to activities of daily living (ADL), challenges of the disabled community, while reviewing the existing solutions offered. This hands on course offers the students small scale projects intended for a real client and will develop and manufacture a tailor made solution while implementing the knowledge gained during the course.

Ethics of the Fathers
Academic hours: 56
Ethics of the Fathers or in Hebrew: “Pirkei Avos”, literally Chapters of Our Fathers, is a section of the Mishna, one of the most fundamental works of the Jewish Oral Law. The Mishna was authored in the third century C.E., and discusses laws and customs of virtually all areas of Judaism, ranging from holidays, dietary laws, Temple service, marriage and divorce, and civil law. It records opinions of scholars from approximately the five centuries preceding the Mishna’s writing. Pirkei Avos is the only section, or tractate, of the Mishna which is devoted exclusively to the ethical and moral statements of the Sages. For this reason, it is usually referred to in English as Ethics of Our Fathers. The tractate consists of six chapters.

Introduction to Economics for Engineers
Academic hours: 28
The course introduces students to the basic concepts of microeconomics, such as scarcity and choice of factors of production, decisions of producers and consumers in competitive and monoplistic markets and governmental intervention in these markets. In addition, the course provides some basic tools to economic feasibility analysis. The course includes the following topics: Factors of Production and Production Possibilities Curve, Costs of Production and Producers Supply Function, Demand and Equilibrium in Competitive Markets, Monopoly, Government Intervention in Competitive Markets.
Introduction to Polymers and Plastics
Academic hours: 56
This course begins with terminology and concepts of plastics, and examines the molecular weight, structure and morphology of thermoplastic and thermoset polymers. It teaches properties of solid polymeric material and intermolecular interactions, along with evaluation methods of polymers and plastics. Polymeric elastomers and viscoelasticity analysis are also included.

Managing and Initiating in High Technology Firms
Academic hours: 28
With the acceleration of technological development and increased global competition, many firms discover that the main way to create and maintain a sustainable competitive advantage is by innovation. The management of technology, innovation and "intrapreneurship" within established firms is a new academic discipline, which has emerged in recent years and includes management tools and models. This course deals with the various aspects of initiating and implementing innovation in established high tech firms: strategic, functional, organizational and behavioral. The course presents theoretical models along with practical case studies. This course aims to equip participants with state-of-the-art methods and tools to discover customers' unmet needs through the "Jobs to be done Thinking®" and, more specifically, applying outcome driven innovation methodology; how to transform an established firm's business model for renewed growth.

Introduction to Marketing
Academic hours: 42
This course covers specific aspects that put marketing at the leading edge of the modern firm's activities: understanding customers' needs and designing a comprehensive approach aiming to fulfill these special needs. The students will be exposed to the basic principles, perspectives, concepts, theories and models that have been crystallized into the contemporary science of marketing.

Human Resource Management
Academic hours: 30
The course will provide the knowledge and practical tools necessary for proper management of the human work force within an organization: planning, recruitment, staffing, performance evaluation systems, career development and work relations.

Immunology
Academic hours: 28
The fundamentals of immunology are taught with attention to the singular scientific approach and conceptual development of this relatively new but essential discipline. The introductory course provides students with the knowledge and the intellectual tools to understand immunology today and the challenges of immunology in the future.

Bioinformatics
Academic hours: 28
Life sciences have become in many aspects information technology. The exponential growth of biological data covers all areas of biology and biotechnology – from DNA, RNA and protein sequences via comprehensive data on interactions between biomolecules to structures. The aim of the course is to teach the main concepts of computational visualization, analysis and prediction of sequence and structural biological data with a specific focus on proteins. The course will focus on presenting the field of bioinformatics tools and analysis in an applicable manner. As such, the course will include numerous topics studied in a level sufficient to apply the studied tools on new sequence and structural data of interest.

Culturing Animal Cells
Academic hours: 42
The course deals with practical and theoretical aspects of culturing animal cells. On the practical side, students are exposed to common laboratory work related to animal cell cultures: sterility issues, thawing and freezing, splitting, daily follow-up, cell morphology, medium preparation and change, different cell lines (adherent, semi adherent and suspended), derivation of primary lines, routine tests and more. The practical hands-on work in the lab is followed by a grounding in theoretical background and a discussion on medium combinations, serum free cultures, freezing and thawing aspects, cell lines, transformation, scale-up techniques, unique cell types such as stem cells, and the uses of animal cells in industry or clinics.
Introduction to Control

Academic hours: 70

The subject matter of this course encompasses the fundamental principles and relevant techniques for designing continuous-time SISO LTI control systems that satisfy practically relevant system performance specifications. Topics of the course are: Introduction and foundations, feedback control fundamentals, loop transfer function fundamentals, linear SISO systems, and tracking design with uncertain plants.

Expected outcome of the course: the student will be able to design continuous-time SISO LTI control systems that satisfy practically relevant system performance specifications in frequency domain.

Signals and Systems

Academic hours: 42

An engineer has to have a set of mathematical tools for analysis and design of systems. Systems operate on and produce signals. Therefore both are treated together in this course. The material is organized as follows.

Signals (functions of time mostly); Systems; Differential equations with constant coefficients; LTI state equations; Application of Laplace transform; Feedback loops; Review of Fourier series; Application of Fourier transform.

Water/Waste Cycle

Academic hours: 28

This course takes you on a journey to explore the exciting triangle of environment, water and energy in our emerging world. Lectures combined with field visits to institutions that practice these issues focus on: water management, water resources, desalination, wastewater treatment and reuse, and bio-energy production from waste in Israel. Through field trips to wastewater treatment sites, a desalination site, and a waste digester for electricity production. Students are exposed to solutions for a better future.

Ecological Engineering in Daily Life

Academic hours: 28

The topic of the course:

1. Utilization of engineering knowledge in daily life, with a focus on ecological activities in private lives.
2. Introduction of ecological devices encountered in daily lives.
3. Understanding the engineering principles of ecological devices encountered in the home environment.

Among the introduced devices: desert coolers, geothermal cooling, photovoltaic panels, natural building, and greywater systems.
Myths and Legends

Academic hours: 28
In this course we will explore a selection of myths and legends in text and film format. The course will discuss the development of these works over time and will consider the manner in which different cultural and critical approaches have been applied to them. We will discuss a variety of topics including: Greek and Egyptian myth (Perseus and Medusa, Osiris and Set), English legends (Robin Hood, King Arthur), historical legends (Cleopatra, Spartacus, Jack the Ripper), movie mythologies (Star Wars, Stargate, Lost), western myths (Atlantis, The Philosopher's Stone), and mythical creatures (Loch Ness Monster, Jersey Devil, Golem, Vampires and Werewolves, Yeti).

Basic Hebrew

Academic hours: 56
Tuition: 350$
An introductory course in Hebrew for foreign students, focused on speaking and elementary communication skills.

Sports

Academic hours: 2
Ennis, Basketball, Table Tennis, Aerobics, Karate, Pilates, Yoga, Kick-boxing, Feldenkrais, Chess, Spinning, Gym.

Beyond the Classroom

HOUSING
In Jerusalem, students live in the modern Scopus Student Village, adjacent to the Hebrew University’s Mt. Scopus campus. Each student receives a private air-conditioned bedroom in a suite with four other bedrooms, a living room, kitchen and bathroom facilities. Reasonably-priced meals and snacks may be purchased on campus or nearby.

Braude’s dormitories are modern, spacious, equipped with a kitchen, and comfortable. Study abroad students live alongside Israeli students. The cafeterias offer reasonably priced meals throughout the day.

HEALTH
Students must have a valid health insurance policy for the duration of their studies in Israel.
The Hebrew University and Braude College purchase this health insurance coverage for students who participate in the Study Abroad Program.

SECURITY
The safety and security of the students is taken very seriously. All students receive a comprehensive security orientation upon their arrival. At both the Hebrew University and Braude, guards and security teams are on duty around the clock. All student activities, on and off campus, meet the strictest security requirements.

LEARNING FACILITIES
On both campuses, learning facilities are spacious and comfortable and equipped with today’s most advanced technology. Computerized libraries, up-to-date laboratories and computer labs are available, and WiFi access is widely available.

SPORTS
The Lerner Family Indoor Sports Complex, located near the Scopus Student Village, includes a semi-Olympic swimming pool, sauna, gym, weight room, spinning studio and aerobic fitness center. Adjacent to the complex are ten tennis courts. Monthly memberships can be purchased at a discounted rate.

VOLUNTEERING ACTIVITIES
While staying at Braude College students will have an opportunity to do various types of rewarding volunteer work within the community.
Application Fee: US $80

MINI-SEMESTER (Part 1 in Jerusalem)
Program Dates: 26.2.2017 – 15.3.2017
Housing: US $450

SPRING SEMESTER (Part 2 in Karmiel)
Program Dates: 15.3.2017 – 5.7.2017
Housing + Meals + Study trips: US $4530
Health Insurance coverage is included.
No Tuition Fees for Engineering courses.

For academic information regarding the Engineering Program contact:
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This brochure is intended to provide general information and in no way constitutes a legal obligation on the part of the Hebrew University and Braude College.

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