July 2022

TECHNION
Israel Institute of Technology

Humanities Honors Program for Undergraduate Students at the Technion

Humanities at the Technion

The Technion – Israel Institute of Technology seeks to contribute to Israel and to humanity at large, via scientific and technological research and education. In the past century, we have provided our graduates with scientific and technological training of the highest standards and supplied our researchers with state-of-the art research environments. Recently, we have come to the realization that in order to best perform our mission, we must also develop in-house capacities in the humanities, and encourage our students and faculty members to engage with ideas and methods in history, philosophy, literature, ethics, etc.

Therefore, our immediate plan, which we have already initiated, is to substantially develop the Department of Humanities and Arts in the Technion by recruiting new excellent faculty members, develop and offer new and exciting courses, and promote relevant research activity and opportunities throughout the Technion.

Humanities Core Studies

The Technion educates Israel's scientific and technological leadership. A century of Technion history teaches that our graduates reach impactful positions and are situated in significant decision points. We expect them to steer the Israeli and international technological R&D boat with integrity and professionalism, guided by a deep sense of commitment to their society. Indeed, “Nurturing and Educating Leaders” is explicitly defined as one of the four pillars of the Technion’s strategic plan (2021-2031), which stresses the importance of science and engineering in a societal, historical, and environmental context. We seek to equip our graduates with the means to understand human beings, as individuals and as a society, and their environment.

We believe that core studies in the humanities – such as history, languages, philosophy, and literature – offer key methods to nurturing such leaders. Moreover, training in the humanities would broaden the future graduates’ horizons, open their

minds, and expand their toolbox in significant ways. For example, the study of history and literature enriches and develops the capacity of human imagination; training in logic develops critical ability for questioning presuppositions that are usually taken for granted; philosophical training habituates one to challenge underlying assumptions in both practical and theoretical pursuits; it also stimulates the mind to conceive questions from new angles, improve communication skills, and develop creative thinking abilities.

There is a tendency to draw a dichotomy between education in the humanities and training in the natural sciences and engineering. We believe otherwise. We think that scientific and humanistic training are not contradictory but rather complementary. Engineers and scientists with training in the humanities are in a better position to develop an edge. One would not want the future scientist, engineer, or developer to be mindless of what it is that they develop. Courses in philosophy, history and literature enable scientists and engineers to expand their cognitive boundaries and thus to enhance their capacity to understand the complex role of technology in current culture and society.

***

We wish to establish two parallel tracks for undergraduate core humanities education:

A. The basic track – allowing all Technion undergraduate students (ca. 10,000 in Israel) to enjoy an improved humanities program as part of their obligation to take three (6 credit points) enrichment courses (as prescribed by the council of higher education).[1]
B. An honors program – intended for a select group of outstanding students; an intensive 26 academic hours program in the humanities.

The current document focuses on the second track – the *Humanities Honors Program*

Project Description

The Honors Program aims at providing intensive and essential humanistic education to a select group of undergraduate students at Technion. Its main goals are to:

1. Acquaint the students with basic ideas and concepts in history, literature, philosophy, ethics, etc. and endow them with a broader worldview.
2. Develop graduates' skills and capacities, such as: creative thinking, ethics and social responsibility, criticism, communication and argumentative skills
3. Create a cohesive discussion group, with a common interest in the interfaces between STEM and the humanities

[1] This track already exists; but the additional courses will strengthen it both by adding courses and by greatly improving the quality of the courses we shall offer.

4. Foster agents of change in academia, as well as in the private and public sectors, who will promote – as individuals and as a group – more holistic approaches to challenges and dilemmas
5. Induce a spill-over effect on the entire undergraduate community at the Technion, increasing their interest and motivation to study the Humanities

In order to achieve the above goals, a few principles underlie the Program:

A. We will offer a wide variety of courses in ethics, logic, philosophy, history, literature and influential humanistic texts.
B. Each student will take courses from all these subject areas.
C. All Technion undergraduate students are potential candidates for the Program. Students who wish to apply to the program will do so in the second semester of their first year, after having taken one or two courses in the humanities. The Program will start in the second year of the undergraduate degree.
D. Each semester of years 2,3,4 there will be one compulsory core course, which all students in the program will take. This will form an identity group with a common language and common interests.
E. The students will give public presentations of their seminar work, open to the entire Technion community.
F. Upon graduation, alumni will become part of the Humanities Honors Program Alumni Network

We believe that (D) above will be our unique way of motivating students to open up their minds to the humanities, and it will also help us with the admission process – making sure there is a good fit between the student's capabilities and interests and the program.

Overview

Target Group: A select group (ca. 30 students each cohort) of distinguished undergraduate students, from all Technion faculties, who are interested in adding an intensive humanities component to their studies and are capable of doing so successfully

Admission: Students who wish to apply to the Program will do so after the second semester of their first year, having taken one or two courses in the humanities[2]: one core course from the Program's curriculum in the first semester, as well as one elective course (either from the Program's curriculum, or a Faculty course recognized by the Program) in either of the semesters.

[2] Those who will not enrol into the program will gain these credits as part of their general elective courses.

Students will then choose whether to apply to the Program in their second year, based on their impressions and achievements in these courses. Official enrolment in the Humanities Honors Program will start in the second year of the undergraduate degree. Admission will be based upon achievements in those three courses, overall academic performance, and a personal interview.

Terms

Once admitted to the program, students will receive:

- A full scholarship and living stipend for the entire degree (including retroactively for the 1st year)
- Recognition of the three courses they took in their first year as part of the Honors Program requirements.

All students in the Program will be assigned an academic advisor. The Program's advisor/s will help students in course selection, provide general guidance throughout their studies and direct the monthly group sessions.

Students are also invited to the departmental fortnightly seminar.

Program Structure

The Program will offer 22 courses, divided into 6 categories (see course details under "curriculum" below).

Students in 4-year programs are required to complete 26 academic credits consisting of:

- 12 courses (2 academic credits each) including:
    - 7 core (compulsory) courses – one in the first year and then one each semester.
    - 5 elective courses – one in the first year, two in the second year, two in the third year.
- Writing a seminar paper (6,000 words; 2 academic credits) in the last year of their studies and presenting it publicly.

Students in 3-year programs will take 10 courses (5 core and 5 elective) and write a seminar paper.

Students are also expected to take part in the monthly group sessions, in which the Program's academic advisor will moderate a discussion on a relevant issue.

Since all Technion students are obliged to take five elective courses, this means that students in the Program will need to take 7 courses (and one seminar), in addition to the 45 courses required by the student's main Faculty.

	Number of students	Core courses to be studied by each student	Elective courses to be studied by each student	**Total courses to be studied by each student**
1st year	(30)*	1 (2 hrs)	1 (2 hrs)	2 (4 hrs)
2nd year	30	2 (4 hrs)	2 (4 hrs)	4 (8 hrs)
3rd year	30	2 (4 hrs)	2 (4 hrs)	4 (8 hrs)
4th year**	30	2 (4 hrs)	seminar (2 hrs)	2 + seminar (6 hrs)
Total	**120***	7 (14 hrs)	5 + Seminar (12 hrs)	**12 + seminar (26 hrs)**

* Official enrolment in the program takes place in the second year of study.

** Students in 3-year programs will write the seminar paper in their 3rd year, and will in total complete 5 core courses, 5 elective courses and a seminar, i.e., 22hrs.

Program Evaluation:

As this is a completely new experience for the Technion, we wish to constantly evaluate ourselves and remain open and flexible to modifications as we progress. We therefore plan to closely monitor and evaluate the Program from its initiation.

A dedicated evaluation committee will be assigned to the Program and will report to the Technion and Program management annually.

Curriculum (see course details in the Appendix)

Following is a tentative list of the Program's 22 courses, divided into 6 main headings:

A. <u>Ethics, Social, and Environmental Responsibility:</u>
1. Social Responsibility - core year 1
2. Ethics of AI - core year 4
3. Environmental Responsibility - elective
4. Eco-philosophy: Environmental Thinking - elective

B. <u>Logic and Philosophy</u>

5. Logic of Everyday Life - core year 3
6. Deductive Logic and Logical Fallacies - elective

7. Philosophy of Language and Modal Logic - elective
8. The Mind-body Problem: from Plato to our days - elective

C. Culture and Arts:

9. Religions: A Comparative Outlook
10. Artistic Movements and Theories – a Historical Perspective
11. Theories of Multiculturalism and Identity
12. Fundamentals of Musicology

D. History and Philosophy of Science and Engineering:

13. Philosophy of Science and engineering - core year 2
14. History of Science and engineering - core year 2
15. The Future of Brain-science, Cognitive Science, and AI - elective
16. History of Mathematics - elective

E. Humanistic Influential Texts:

17. Select Readings in Ancient and Medieval Non-fiction - elective
18. Select Readings in Modern Non-fiction[3] - core year 3
19. Select Readings in Contemporary Non-fiction[4] - elective

F. Literature:

20. Select Readings in Ancient and Medieval Fiction - elective
21. Select Readings in Modern Fiction - core year 4
22. Select Readings in Contemporary Fiction - elective

Courses will be developed gradually during 2022-2026.

Flexibility

The program described above, and detailed in the appendix, is structured and well-defined, to the level of syllabi and lecturers. However, as this is a new experience for the Technion, we believe a good level of flexibility is essential to succeed and develop it to the right directions. This is especially true when we are discussing a small and select group of excellent motivated students. Therefore, we are willing to consider, in exceptional cases, on an individual per-case basis, and only after consultation with the program's academic advisor, acknowledging a humanities course[5] offered by the main faculty as part of a student's required credit points for the program.

[3] At least one text about engineering
[4] At least one text about engineering
[5] Just as examples, a few existing humanities courses that could be considered are: "…" given by the faculty of … , "…" given by the faculty of …, "…" given by the faculty of …

Financials and Giving Opportunity

A gift of $9,600,000 will support this project for a seven-year period.

Project Budget: 7 Years (USD)			
Item	**Amount Requested from Mandel Foundation**	**Technion Matching Funds**	**Total**
Personnel			
Academic Supervision, Management and Professional Advisors	1,811,000	-	1,811,000
Administrative Support and Coordination	319,000	-	319,000
Research Fellows	206,000		
Teaching Personnel	139,500		
Total Personnel	**2,475,500**	**-**	**2,130,000**
Student Benefits			
Tuition	2,215,000	-	2,215,000
Living stipends	2,130,000	1,700,000	3,830,000
Laptops	155,000	80,000	235,000
Total Student Benefits	**4,500,000**	**1,780,000**	**6,280,000**
Programmatic Costs			
Curriculum development	320,000	80,000	400,000
Teaching costs	-	1,500,000	1,500,000
Monthly lectures / seminars	80,000	-	80,000
Total Programmatic Costs	**400,000**	**1,580,000**	**1,980,000**
Program infrastructure	2,224,500	3,540,000	5,764,500
Total	**9,600,000**	**6,900,000**	**16,154,500**

The Student Benefits above reflect the per student amounts of:

- Tuition: $3,360 per year
- Living Stipend: $3,230 per year
- Laptop: $740

- בהתאם למודל ההתנהלות הפיננסית של הטכניון, הוצאות התשתית הינן מרכיבי הפרויקט המשולמים מתוך תקציב הטכניון ולא מתקציב הפרויקט. הוצאות אלה כוללות שימוש במתקנים ובתשתיות ההוראה, מרכיבי ביטוח ואחזקה, שירותים שונים עבור הסטודנטים ואחרים וכיו"ב.

According to the Technion's financial model of management, infrastructure expenses are [Project's components] that are paid out of the Technion's budget and not from the Project's budget. These expenses include the use of facilities, teaching infrastructure, various services provided for the students, etc.

Donor Recognition

The Program will be named after Jack, Joseph and Morton Mandel, and the donor will be honored with the title "Technion Guardian," the highest recognition given to a donor at the Technion

During the period of support, the donor will receive an annual project report and will have the opportunity to meet with Program affiliated faculty and students.
The project will be listed in the "President's Report," the official annual report of the Technion.

Appendix: Short Course Descriptions

We are currently in the process of hiring new faculty members, that are likely to teach some of the program's courses. Therefore, some of the teachers' names are still missing, as well as some of the course descriptions.

A. Ethics, Social and Environmental Responsibility:

1. Social Responsibility (234292 Tamar Gutgold Cohen)

Introduction, historical background, law and justice, distribution of social and economic resources among residents, African-Americans' fight for equality, evolution of equality in Israeli law, affirmative action, equality for minorities in Israel, feminist legal theory, equality and justice in private law, workplace equality, ageism, equality of opportunity for people with disabilities.

2. Ethics of AI (324992 Dina Raphael)

The course deals with philosophical issues related to ethical and professional ethics. Among the topics to be discussed: trade and freedom of information, information security, purpose biased information processing, ethical implications of artificial intelligence, the moral implications of technological breakthroughs and implications of data usage on individual rights.

3. Environmental Responsibility (Avigail Ferdman)

Does nature have intrinsic value, i.e., regardless of its contribution to humans? Do animals have moral standing? And what about ecosystems like rainforests? Do we have moral obligations towards people who have not yet been born? Does caring for the environment necessarily impede economic growth? The aim of the course is to provide the tools to intelligently discuss such pressing questions by studying and contemplating the key concepts, ideas and arguments that have developed in the rapidly growing field of environmental ethics, especially over the past four decades.

4. Eco-philosophy: Environmental Thinking (324265 Alik Pelman)

The aim of the course is to provide the tools to discuss the pressing questions regarding the environmental crisis and to become familiar with the various perspectives on them. This is done by getting acquainted with the key concepts, ideas and arguments that have emerged in environmental thought, such as "nature's free services," "ecological footprint," the I=PAT equation,"the tragedy of commons."

B. Logic and Philosophy

5. Logic of Everyday Life (Alik Pelman)

The course will provide students with critical tools for academic studies in general and scientific inquiry in particular. The course focuses on non-deductive arguments – i.e., inductive and abductive arguments in which the conclusion does not logically follow from the premises but is nevertheless well supported by the premises. Such arguments form a significant part of the arguments used in the context of scientific inquiry, but even more so in everyday life, e.g., in the courtroom, the clinic, or by the engineer, who is trying to convince us of some proposed solution, or to confirm that it is indeed scalable.

6. **Deductive Logic and Logical Fallacies (Dustin Lazarovici)**
   In the first part of the course, we will be introduced to different types of deductive arguments, how to construct good arguments, as well as how to extract arguments from natural language texts (e.g., news articles). To this end, we will acquire skills such as principles of interpretation, identifying hidden assumptions, neutralizing rhetorical language, and more. Once we have learned to extract arguments from texts, the second part of the course will focus on systematic evaluation of arguments thus extracted. In particular, we will learn to prove whether a given argument is valid or not. In addition, we will learn to identify different types of logical fallacies – i.e., arguments that make a nonvalid argument to appear valid – and how to avoid such fallacies.

7. **Philosophy of Language and Modal Logic (Alik Pelman)**
   The course will focus on meaning and reference, viz., the fascinating, and sometimes mysterious, relation between language and world. In the first part, we will study issues concerning singular terms – and in particular proper names and definite descriptions – while the second part of the course will be dedicated to complete sentences. In the course of study, we shall discuss the views of key philosophers who have shaped this field of research, such as: Frege, Russell, Wittgenstein, Quine, Grice, Davidson, Strawson, Dummett, Putnam, Searle, Kaplan, Kripke, and Lewis.

8. **Mind-body Relations: from Plato to Our Days (324267 Ohad Nachtomy)**
   The course examines the philosophical question of mind-body relations. It presents the central positions from Plato to the present day. We discuss how the gap between mind and body has come about in the early modern period and examine scientific, philosophical, as well as practical approaches to it.

C. Culture and Arts:

9. **Religions: A Comparative Outlook**
   To be developed.

10. **Artistic Movements and Theories – a Historical Perspective (Roy Oppenheim)**
    To be developed.

11. Theories of Multiculturalism and Identity (Avital Binah-Pollak)
To be developed.

12. Fundamentals of Musicology (Dan Cohen)
To be developed.

D. History and Philosophy of Science and Engineering:

13. Philosophy of Science and Engineering (324266 Alik Pelman)
The course critically examines the scientific method – its strengths and weaknesses. Students will gain good understanding of the scientific method and its logic, and in particular, how to use it to practice scientific inquiry: how to formulate a theory from observations, how to confirm an existing theory, how to refute an existing theory, how to use a theory to predict phenomena and how to explain observation, and how to use a theory to explain another theory. In the second part of the course, we shall examine severe problems with each one of these elements of the scientific methods – problems that were mainly raised by members of the scientific community itself.

14. History of Science and Engineering (324305 Oren Bader)
This course aims at introducing basic concepts in the history of science from antiquity to the 19th century. The course will discuss how scientific knowledge develops, transforms, and changes and examines how science is defined across history and how major scientific revolutions come about.

15. The Future of Brain-science, Cognitive Science, and AI (Justin Smith)
To be developed.

16. History of Mathematics (326005 Dustin Lazarovici)
The course will explore the history of mathematics and its connection to philosophy through a series of landmark results, from the discovery of incommensurability By the Pythagoreans to Godel's Incompleteness Theorem. a recurring theme is how the concept of Infinity has challenged the limits of human understanding.

E. Humanistic Influential Texts

17. Select Readings in Ancient and Medieval Non-fiction (Noa Lahav-Ayalon)
Guided readings of texts such as Plato's *Republic*, Aristotle's *Nicomachean Ethics*, Augustine's *Confessions*, Maimonides's *Guide of the Perplexed*, Machiavelli's, *The Prince*

18. Select Readings in Modern Non-fiction (Justin Smith)
Reading texts such as Descartes' *Meditations*, Hobbes' *Leviathan,* Rousseau's *Discourse on Inequality,* Smith's *Wealth of Nations,* Kant's *Groundwork of the*

Metaphysics of Morals, the US *Declaration of Independence, The Declaration of the Rights of Man 1789,* selections from Marx, Nietzsche's *On the Genealogy of Morals,* selections from Freud

19. Select Readings in Contemporary Non-fiction (Vessel Rijers)
To be developed.

F. <u>Literature:</u>

20. Select Readings in Ancient and Medieval Fiction (Liran Gordon)
Readings texts such as Homer's *Iliad* and *Odyssey,* Sappho's *If Not, Winter,* Plato's *Symposium*, Virgil's *Aeneid*, the *Life of Aesop*, Ibn 'Arabi, *The Translator of Desires: Poems,* Dante's *Inferno*

21. Select Readings in Modern Fiction (Justin Smith)
Readings texts such as Shakespeare's *Othello*, Cervantes' *Don Quixote*, Austen's *Pride and Prejudice*, Dostoevsky's *Crime and Punishment*, Kafka's *Metamorphosis*; Woolf's *To the Lighthouse*, Borges' *Fictions*; works by S.Y. Agnon, W.G Sebald (such as The Emigrants or Austerlitz).

22. Select Readings in Contemporary Fiction (Ohad Nachtomy)
To be developed.