

Vision & Implementation-Space & Multidisciplinary Curriculum

The goal of the "**Space and Multidisciplinary**" project is to create a two - year course that will include interdisciplinary learning-on a broad scale ranging from the humanities and social sciences to the natural sciences and exact sciences.

All of the above under the unifying umbrella of space science and exploration and the use of PBL project-based learning.

In today's labor market, and in modern life as a whole, multidisciplinary and flexible thinking are critical to effectiveness and optimal integration into today's society. Through this course, students will be exposed to the fascinating and interesting world from a wide range of fields, and will have the opportunity to learn and experience them in a fun way.

Moreover, our project will address a real pedagogical need of the education system in the years of the beginning of the upper division.

During the middle school years, many schools place great emphasis on exposing students to different interests in order for them to decide when they transition to high school on the trend that best suits them. During the selection process, there has been great difficulty for students who have so far been exposed to a limited range of subjects, and now have to choose what they will learn in the coming years and possibly after.

Our program exposes them to a wide spectrum of interests, and may help them decide what field they are good at, which they want to study and so on. Our way to integrate broad areas of learning is under the roof of space studies and multidisciplinary studies in which

we bring together a wide range of disciplines that connect as a puzzle to one and complete a holistic picture.

The field of space, which forms the basis for the study of all these subjects, through which the various fields are demonstrated and accessible to students - is only a means. It is a breeding ground, because it is a very broad field on the one hand, and very young educationally (on the other hand), Ground to the same interdisciplinary disciplines that underpin our project. Because it is an area relevant to our lives (in light of resource depletion, global warming and population density that threaten the survival of our planet) and very young in its educational aspect in schools- space is the perfect ground for laying the foundations of our program.

With respect to the world of industry and high-tech that operates in the space field and has been exceptionally successful in recent years, the demand has been created to increase and integrate its exposure to the future generation. At the end of each study unit, the students will perform a small group project in its scope that will help in the study and the provision of the material based on the principle of project-based learning.

During the various projects, students will receive guidance, guidance from industry and high-tech professionals who will come to lecture and accompany the students. The same project-based learning that will guide the project has many advantages - it also helps and contributes to a deeper understanding of the material following application in the field, also incorporates essential and important elements such as collaboration and of course makes the learning experience much more enjoyable. At the end of the course, students

will compete in school, municipal, national and perhaps even international competitions that will draw on the knowledge they have acquired so far and combine the tools and skills they have learned during the course

The annual course is competitive and experiential. These principles of project-based learning, collaboration and teamwork, as well as ideas of interdisciplinary, dynamic and flexible thinking, are the future when it comes to the innovative labor market to which the education system prepares its students and are the foundation of our vision.

Target Audience

The target audience for the space and multidisciplinary program is middle school & high school students, and it is designed to empower students under the unifying umbrella of space technologies and entrepreneurship as a future tool for integrating into a limerick growing industry , and to enrich the knowledge and increase the opportunities for an exciting and lucrative career.

The aforementioned age range is an audience of students who are in a very important trough in their academic and professional futures as high school studies have an impact on military service as well as academic studies down the road. In addition, they are at the stage of choosing their high school majors and the areas of specialties they would like to pursue in the years to come. Therefore, the program for the above ages is labeled from the place and the understanding in which the students and many students have different tastes and preferences, which they carry from an early age, harnessing them under the theme of space, in order to expose them to the great educational and business potential inherent in the field, which can

affect their future, without giving up on the fields close to their hearts and their skills.

Biennial Syllabus

Over the course of the two years, the curriculum will be divided into two main parts: - Theoretical learning, which combines project-based learning on the following topics: - Generic space studies: introduction and core on the subject of space exploration and space mission history, introduction and core lessons on technology and satellites, introductory and core lessons on the subject of space exploration and space mission history, introduction and core lessons on technology and satellites, introductory and core lessons on the subject Of entrepreneurship and space, introductory and core lessons on the subject of space exploration and colonization.

Theoretical background for performing the mission: Learning interdisciplinary subjects in the context of space. For example: psychology, anatomy, architecture, art, physics, sustainability and agriculture - all under the umbrella of space. These subjects will be used by students to create a product later on.

- Enrichment studies: The acquisition of a number of diverse fields in the context of space. For example: history, literature, media, climate, etc. These subjects will make learning more experiential and meaningful, even when they will not contribute to the performance of the product in a practical way. Enrichment studies as opposed to generic studies will allow the selection of a lesson in each theme that is closer to the heart from a number of multi-theme fields.

- Imparting skills: Workshops to learn skills that will be used by students to carry out the final project, including: video editing workshop, public speaking, research workshop, editing and modeling tools, etc. With the tools, knowledge and skills they will acquire, they will be able to execute the final product.

The offered syllabus

- Cluster A - Introduction to the Study of the Universe + Multidisciplinary

4 Introductory and core lessons in the subject of the study of the universe + 4 multidisciplinary lessons 2 mission lessons in the stellarium:

Generic: A look at our Earth and its connection to space - an introduction to the solar system and its various planets.

- Multidisciplinary: biological, physical, geographical, design aspects of the sphere

Earth and the solar system.

Generic: Other solar systems, Extrasolar planets Search for twin Earth/intelligent civilizations.

- Multidisciplinary: Philosophies regarding other life forms in the universe, history of exoplanet exploration, physical/biological aspects of exoplanets, Architecture Future of Extrasolar Planets, about the SETI Drake Formula and Search transmissions of other intelligent civilizations .

- Generic: galaxies, galaxy formations, clusters and deep space.

- Multidisciplinary: Black Holes and Art-physical aspects of galaxy structures, star clusters and black holes, history of telescopes in general and space telescopes in particular.

- Generic: exploring the depths of the universe.

Multidisciplinary: The universe and its formation in the Time Mirror of religion includes philosophical questions about the beginning of the universe, the fundamental materials from which the universe is built and antimatter,particle physics and spectral signatures for understanding the beginning of the universe.

- Project: Mission preparation in the STELLARIUM app of mapping and understanding the night sky and creating a short movie of the observations.

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Cluster B-Space Technologies

3 Introductory and core classes + 3 multidisciplinary lessons in the subject of technology and satellites 3+ 3D Modeling task classes in Tinkercad+School Competition Record Day:

- **Generic:** types of satellites-observation, espionage, navigation and communication.

- **Multidisciplinary:** Geo-Political and Military Aspects for Satellites and Space Communications,

Smart agriculture using remote sensing, climate prediction.

- **Generic:** satellite orbits-polar, GEO ,MEO, LEO.

- **Multidisciplinary:** Navigation and space technologies, technological aspects of satellites and control, history of satellite launches.

- Project: Satellite development.

- **Multidisciplinary:** Various touches in satellite development-physical aspects, photography and remote sensing devices, economic planning of satellite mission and development ,ecological aspects

Environmental Satellite Development

- **Generic:** Space technologies in everyday life-the International Space Station.

- **Multidisciplinary:** Chemical/biological/medical/psychological experiments done on the space station in a state of microgravity, ergonomic design of the interior of the space station

And the life of the astronauts, biophilia.

Lecture by NSL satellites CEO

- **Project:** 3D modeling in Tinkercad and 3D printing of satellite.

Cluster C-Space Exploration and Space entrepreneurship

3 Introductory and core lessons on the subject of space exploration
2 + Mission lessons:

- **Generic:** An Historical overview from the invention of the telescope to the beginning of the New Age in Space Agencies (-

Generic: The Big Projects-Gemini / Apollo 1970s and 80s)

- **Generic:** space stations and shuttles, the Cold War, the ballistic missile race and the space race. - Interim project: Conducting research on a space scientist, creating a Wikipedia entry. -

- 2 Introductory and core lessons + multidisciplinary lesson on the subject of Entrepreneurship and Space 3 + Mission lessons: Project development in the field of new space

- **Generic:** New Space-Leading companies in the field-Origin Blue, SpaceX

.,Axiom space

- **Multidisciplinary:** Ethical approaches when it comes to new space and the accessibility of space.

- **Generic:** Israeli entrepreneurship in space. Israeli companies are making breakthroughs in the field and milestones in their establishment

Spacepharma lecture-Small and smart labs in space

- **Spacell lecture**-From Genesis to Genesis, how success is measured

- **Project:** Developing a project in the field of new space, writing a business plan with technological and economic aspects to the project. Making a short promotional video and presentation of the project/company.

Cluster D-Interplanetary Settlement

- 4 Introductory and core lessons 4 Multidisciplinary lessons: On the subject of exploration and settlement in space 3+ Mission lessons: Planning, modeling and establishing a colony on a planet

Pick Day: National Competition for 3D Colony Development and Modeling

Generic: Going back to the Moon-Project Artemis.

- **Multidisciplinary:** The Moon in various cultures, mythologies and history, history of the journey to the moon, economic and energy uses to the Moon, architectural aspects

Generic: A future colony on the moon. Return to Mars-Human exploration of Mars.

- **Multidisciplinary:** Climate aspects of Mars, geological aspects of

Mars lava caves, canyons, quarries , Application of satellite and super-communication technologies on Mars.

- **Generic:** Future exploration in our solar system.

- **Multidisciplinary:** The Human Aspect of future voyages in the Solar system, potential planets and moons for colony planning in biological and climatic aspects, aspects

Psychological for long manned journeys in interstellar space .

- **Generic:** Star Trek, Proxima B - Breakthrough Interstellar .initiatives

- **Multidisciplinary:** Economic aspects of Star Trek, philosophical contemplation of time travel and its expenses, thinking about groundbreaking future technologies that will help

Get closer to the speed of light.

Lecture by Helios Project CEO.

- **Project:** Design, modeling and establishment of a colony on another planet Application of multidisciplinary aspects to the colony and 3D modeling Competitive hackathon with the products

The winners will participate in a national / global competition.

Skills Workshops:

- **Video editing workshop:** Learning camtasia editing tools, imparting guiding principles in marketing videos and photography, editing and animation techniques.

- **Research workshop:** Imparting scientific tools, the scientific method, scientific writing.

- **3D modeling workshop:** Learning the Tinkercad modeling tool includes 3D printing.

About the project director Nir Dubrovsky:

Nir is a space visionary entrepreneur, pedagogist and lecturer with a vast experience of founding and executing space start ups and educational programs. mainly projects that cross boundaries.

Nir is an ex senior mentor at Ramon foundation “spacelab program”

,lecturer at spaceil-The first Israeli organization to send a spaceship to the moon ,A space teacher and pedagogist. An active member and

speaker at the IAU (International Astronomical Union) and he is the director of Tel-Aviv region of space educators "Horizon" under the Israeli space agency ,From which he got the 2021 year best educator. The founder of Exom space, "Multi Space" and the initiative "We are all residents of the milky way", Nir believes that under the umbrella of space education and exploration, we can gather teens and students from rival countries to build together a better future for humanity. Nir holds a Msc. in Geography, An Msc. in Earth and environmental science and an MBA degrees.