MIRAI
INNOVATION

Global Innovation Technology Program

An International Immersion Program in Emerging Technologies

August 2026 • Mirai Innovation Research Institute, Osaka, Japan

Language: English | Format: Seminars, Workshops & Team Projects

Hosted by: Mirai Innovation Research Institute

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About Mirai Innovation Research Institute

Mirai Innovation Research Institute, located in Osaka, Japan, is dedicated to bringing innovation to life through emergent technologies. Its team of scientific researchers, software and hardware developers, designers, innovators, strategy analysts, and business experts develops innovative projects in artificial intelligence, robotics, augmented and virtual reality, computer vision, and neurotechnologies.

Mirai Innovation's services span three main areas: Research and Development of emerging technology-related products and services; Consulting, designing strategies that help organizations use technology to drive growth; and Academic Training, providing participants with a well-rounded understanding of cutting-edge emerging technologies through international programs. In 2025, Mirai Innovation was selected by the Japanese government to showcase its WAVEX neurotechnology product at the Healthcare Pavilion of World Expo Osaka 2025.

Through its technology & academic programs, Mirai Innovation has welcomed students, researchers, and professionals from across Europe, America, and Central Asia, combining technical seminars, hands-on workshops, and applied projects developed in collaboration with partner universities and companies.

Welcome Message from the Managing Director

Dr. Christian Peñaloza — *Managing Director, Mirai Innovation Research Institute*

On behalf of the entire team at Mirai Innovation Research Institute, it is my pleasure to welcome you to the Global Innovation Technology Program. Over the course of one month, you will work alongside researchers, engineers, and entrepreneurs, gaining hands-on experience with technologies that are shaping the future: neurotechnology, robotics, artificial intelligence, blockchain, the Internet of Things, and virtual reality.

This program is designed not only to introduce you to these technologies, but to give you the opportunity to apply them to a real project of your own — working in English, alongside peers and mentors from different countries and disciplines. We look forward to seeing the ideas you bring to life during your time with us.

Program Overview

The Global Innovation Technology Program (GITP) is a month-long international immersion program hosted at the Mirai Innovation Research Institute in Osaka, Japan, designed for Japanese students and professionals seeking exposure to a global, English-language research and innovation environment. During this program, participants engage with leading researchers, engineers, and entrepreneurs across neurotechnology, robotics, artificial intelligence, blockchain, IoT, virtual reality, and embedded systems.

The program opens with a one-week Futures Design Sprint, in which participants learn a structured methodology for anticipating technological change and translating emerging signals into near-future product, service, or system concepts. Building on this foundation, the remaining three weeks combine expert seminars and hands-on technical workshops with dedicated project time, during which participants develop their own project or project proposal — applying what they learn in real time toward a concrete outcome.

All sessions are conducted in English. The program emphasizes cross-cultural collaboration, technical depth, and applied, project-based learning, culminating in a closing showcase where participants present their projects to instructors, mentors, and invited guests.

Objectives

- To expose Japanese students and professionals to an international, English-language research and innovation environment.
- To introduce participants to Futures Design as a methodology for anticipating and shaping technological change.
- To provide hands-on technical training across neurotechnology, AI, robotics, IoT, virtual reality, blockchain, and embedded systems.
- To connect participants with international researchers, engineers, and entrepreneurs as mentors.
- To guide participants in developing an original project or project proposal over the course of the program.
- To build participants' confidence in presenting and discussing technical work in English within a multicultural team.

Deliverables

- A curated set of trends in emerging technologies (Week 1).
- A future scenarios analysis with opportunities and risks for a chosen application domain (Week 1).
- A near-future product, service, or system concept built on an emerging technology (Week 1).
- A prototype of the Week 1 concept.
- An individual or team project / project proposal, developed across Weeks 2–4 using the technologies introduced in seminars and workshops.
- A final presentation/pitch at the Closing Ceremony.

Program Structure

The program runs Monday through Friday (no weekend sessions). It is organized into four weeks, each with a distinct focus:

Week	Focus	Description
Week 1	**Futures Design Sprint**	Introduction to Futures Design methodology: horizon scanning, alternative futures, speculative prototyping, and final pitches. Teams form around a technology domain and define their initial project direction.
Week 2	**Robotics, AI, Neurotechnology & Connected Systems**	Seminars and workshops on brain-computer interfaces, neurotechnology, applied AI, and IoT.
Week 3	**Embedded Systems, Blockchain & Immersive Tech**	Seminars and workshops on robotics, blockchain-robotics integration, virtual reality, and web development. A dedicated Project & Problem Assignment session introduces the specific challenges and project topics participants will develop. Dedicated project development begins this week and continues through Week 4.
Week 4	**Project Development & Final Presentations**	Team Project development,final presentations, and the Closing Ceremony.

Daily Format

- Session 1 (10:00–13:00): Seminar or Workshop (approx. 3 hours).
- Lunch break (13:00–14:00).
- Session 2 (14:00–17:00): Seminar, Workshop, or Project Work (approx. 3 hours).
- Project Work session (17:00–18:00): from Week 3 onward, an additional daily hour dedicated to individual or team project work, with mentor support.

Materials

- A laptop (Windows, macOS, or Linux) for workshops and project work.
- Workshop materials, datasets, code templates, and hardware kits (e.g., microcontrollers, sensors, EEG headsets) will be provided by Mirai Innovation Research Institute and individual instructors.
- Additional readings, slides, and reference materials will be distributed digitally before or during each session.

Background Reading

Upon registration, participants will receive recommended reading materials to familiarize themselves with the general areas covered by the program before arrival. The following are examples of recommended materials that will be provided::

- Neurotechnology & BCI: introductory articles or videos on EEG and brain-computer interfaces (e.g., how EEG headsets work, basic BCI applications in rehabilitation and assistive technology).
- Artificial Intelligence: introductory materials on machine learning concepts (e.g., what is a dataset, what is a model, what is training) — no prior programming experience required, but basic familiarity with Python is helpful.
- Robotics: introductory materials on how robots sense, decide, and act (sensors, actuators, control loops).
- IoT & Embedded Systems: introductory materials on microcontrollers (e.g., Arduino or similar platforms) and how sensors connect to them.
- Blockchain: a general, non-technical overview of how blockchain works and why it is relevant to robotics and distributed systems.
- Virtual Reality: a general overview of how VR headsets and game engines work.

No specialized prior knowledge is required for any of these topics — all workshops are designed as introductions for university-level participants.

Speakers & Instructors — Seminars

Futures Design Sprint Facilitator (Week 1)

Maurits Montañez

Founder & CEO, Manuvo; Associate Director, Strategic Design and Management Program, Parsons School of Design (The New School)

Program: Futures Design Sprint

About: *Maurits Montañez is a software engineer, designer, educator, and entrepreneur working at the intersection of culture, technology, and design. He is the founder and CEO of Manuvo, an award-winning Ed-Tech company established in 2010 focused on enhancing literacy and cultural access across Latin America through technology. He holds a B.S. in Computer Science from the National Technology Institute of Mexico and an M.S. in Strategic Design and Management from Parsons School of Design, where he now teaches futures thinking and design strategy. In 2016, MIT Technology Review named him to its Innovators Under 35 list for his work preserving indigenous languages through the Kernaia project. Manuvo's work has been featured by the New York Times, CNN, and Deutsche Welle, and has received recognition including the Salvador Allende Presidential Medal (Chile, 2017) and the Inter-American Development Bank's Most Innovative Company in Latin America award (2016).*

Seminar Speakers (Weeks 2–4)

The following experts lead seminar sessions throughout the program. Photos and biographies are shown where available; remaining entries will be completed once final details and headshots are provided.

Dr. Christian Peñaloza

Managing Director, Mirai Innovation Research Institute

Seminar: Neurotechnology: Foundations and Applications

About: *Dr. Christian Peñaloza is the Managing Director of the Mirai Innovation Research Institute in Osaka, Japan, where he leads research in artificial intelligence, neurotechnology, and robotics, with a focus on Brain-Machine Interface (BMI) systems. He holds a Ph.D. in Cognitive Neuroscience Robotics from Osaka University and conducted advanced research at the Advanced Telecommunications Research Institute (ATR) in Kyoto, collaborating with Professor Hiroshi Ishiguro on brain-machine interfaces and human augmentation. His honors include MIT Technology Review Innovator of the Year in Mexico, ATR Excellence Research Awards (2018, 2020), and selection for the New York Academy of Sciences Interstellar Initiative (2021–2022).*

Eduardo Castelló Ferrer, Ph.D.

Assistant Professor of Robotics & AI, IE University; Affiliated Researcher, MIT

Seminar: Blockchain for Robotics: Decentralized Systems in Practice

About: *Dr. Eduardo Castelló Ferrer is an Assistant Professor of Robotics at IE University and an affiliated researcher with MIT Connection Science, where he was previously a Marie Curie Postdoctoral Fellow at the MIT Media Lab (2016–2019) working with Prof. Alex 'Sandy' Pentland on the combination of autonomous robotic systems and blockchain technology. He holds a B.Sc. (Hons.) in Intelligent Systems from the University of Portsmouth (UK) and an M.Eng. and Ph.D. in Robotics Engineering from Osaka University, where he worked with Prof. Hiroshi Ishiguro. His research on new security, behavior, and economic models for networked autonomous agents has been published in venues including Science Robotics, IEEE Transactions on Robotics, ICRA, IROS, and AAMAS, and covered by the BBC, Wired, and The Guardian.*

[Photo to be provided]

Dr. Carlos Trenado

Institute of Clinical Neuroscience and Medical Psychology, Heinrich Heine University Düsseldorf; Mirai Innovation Research Institute

Seminar: Neurotechnology: Signal Processing and Applications

About: *Dr. Carlos Trenado is a research scientist at the Institute of Clinical Neuroscience and Medical Psychology and the Center for Movement Disorders and Neuromodulation at Heinrich Heine University Düsseldorf, Germany, with an ongoing research collaboration with the Mirai Innovation Research Institute. His work focuses on EEG signal processing and brain-machine interfaces, including the integration of real-time machine learning classification of motor imagery data with EEG-based BMI systems for rehabilitation and motor training applications, combining EEG headsets, exoskeletons, and virtual reality.*

Dr. Palafox

[Photo to be provided]

Eduardo Espinoza

Industry Representative, Chile

Seminar: Industry Perspective: Technology & Entrepreneurship in Latin America

About: *[Placeholder: full biography to be provided — professional background and company representation.]*

[Photo to be provided]

Edgar Rafael Hernández Ríos, M.Sc.

Lead Engineer, Robotics & Mechatronics, Mirai Innovation Research Institute

Seminar: Robotics & Web Development: Industry and Applied Perspectives

About: *Edgar Rafael Hernández Ríos is the Lead Engineer for Robotics and Mechatronics Development at the Mirai Innovation Research Institute in Osaka, Japan, where he designs and develops advanced mechatronic systems. He holds a Master's degree in Mechatronics from the Polytechnic University of Pachuca. His main projects include the J-CanSat pico-satellite system, the AURA EEG brain-computer interface, virtual reality technologies, and legged robotics, with a focus on robotic teleoperation systems, manipulator arm control, and person-to-person interfaces. He also mentors and advises students on emerging technology projects across robotics, electronics, programming, and AI.*

Eng. Daniel

Eng. Hugo

Barrie

Workshop Catalog

The following hands-on workshops form the technical core of Weeks 2–4. Descriptions and learning objectives below are placeholders to be completed with final content from each instructor.

Developing Brain-Computer Interfaces

Instructor: TBC

Description: *An introductory, hands-on session covering the basics of Brain-Computer Interface (BCI) systems: how EEG signals are generated by the brain, how they are captured with consumer-grade EEG headsets, and how they can be processed in real time to control simple digital or robotic outputs. No prior neuroscience background is required.*

Learning objectives: *Understand the basic pipeline of a BCI system (signal acquisition, processing, feature extraction, classification, output); record live EEG signals using an EEG headset; visualize raw and filtered brain signals; and build a simple demo in which a brain signal triggers a basic action (e.g., a light, a cursor movement, or a simple command).*

Neurotech Workshop

Instructor: Dr. Carlos Trenado

Description: *A practical, introductory session that builds on the Neurotechnology seminar, giving participants hands-on experience with EEG data: how it is recorded, cleaned, and analyzed using basic signal processing techniques.*

Learning objectives: *Load and visualize sample EEG data; apply basic filtering and artifact-removal techniques; identify simple features in EEG signals (e.g., frequency bands); and discuss how these features relate to mental states and BCI applications.*

Artificial Intelligence I

Instructor: Dr. Palafox

Description: *An introduction to the fundamentals of Artificial Intelligence and Machine Learning for participants with little or no prior experience: what AI is, how machines 'learn' from data, and the basic workflow of a machine learning project.*

Learning objectives: *Understand the difference between AI, machine learning, and deep learning; understand the concepts of training data, features, and labels; explore a simple dataset; and train a first basic machine learning model (e.g., a classifier) using a beginner-friendly tool such as Python with scikit-learn.*

Artificial Intelligence II

Instructor: Dr. Palafox

Description: *A continuation of Artificial Intelligence I, focused on understanding how well a machine learning model is performing and how to improve it through basic tuning.*

Learning objectives: *Understand common evaluation metrics (accuracy, precision, recall); split data into training and test sets; compare the performance of two or three simple models on the same dataset; and apply basic hyperparameter adjustments to improve results.*

Artificial Intelligence III

Instructor: Dr. Palafox

Description: *An introductory look at neural networks and deep learning, building on the machine learning foundations from AI I and II, using accessible examples and beginner-friendly tools.*

Learning objectives: *Understand the basic structure of an artificial neural network (inputs, layers, weights, outputs); understand at a conceptual level how a neural network learns through training; and run and modify a simple pre-built neural network example (e.g., image or pattern classification).*

Artificial Intelligence IV

Instructor: Dr. Palafox

Description: *An applied session in which participants begin to scope how an AI component (from AI I–III) could support their own project or assigned problem, with guided examples of common AI use cases in robotics, neurotechnology, and IoT.*

Learning objectives: *Identify a possible AI component for the participant's project (e.g., classification, prediction, or pattern recognition); outline the data needed and how it could be collected; and sketch a basic implementation plan in simple terms (no advanced coding required).*

Robotics 1

Instructor: M.Sc. Rafael Hernández

Description: *An introductory, hands-on workshop covering the basic building blocks of a robotic system: sensors, actuators, controllers, and how they work together. Participants will assemble and power on a basic robotic platform.*

Learning objectives: *Identify the main components of a robot (sensors, actuators, controller, power); assemble a basic robotic platform from provided parts; understand how a simple control loop works (sense → decide → act); and run a first basic program to move the robot.*

Robotics 2

Instructor: M.Sc. Rafael Hernández

Description: *A continuation of Robotics 1, focused on programming simple behaviors for the robotic platform assembled in the previous session, using a beginner-friendly programming environment.*

Learning objectives: *Write and run simple programs to control basic robot movements; use sensor input to trigger a simple reaction (e.g., obstacle avoidance); and understand the basic idea of teleoperation (controlling a robot remotely).*

Web Development

Instructor: M.Sc. Rafael Hernández

Description: *An introductory workshop on web development fundamentals (HTML, CSS, and basic JavaScript), aimed at participants with little or no coding experience, focused on building a simple interface that can display or control a project component.*

Learning objectives: *Understand the basic structure of a web page (HTML, CSS, JavaScript); build a simple static web page; and create a basic interface element (e.g., a button or display panel) that could be connected to a project, such as a robot or sensor.*

Internet of Things (IoT)

Instructor: Eng. Hugo Herrera

Description: *An introductory, hands-on workshop on the basics of the Internet of Things: how everyday devices can be connected to sensors and to the internet to collect and share data.*

Learning objectives: *Understand the basic components of an IoT system (sensor, microcontroller, connectivity, cloud/dashboard); connect a simple sensor (e.g., temperature or light) to a microcontroller; and send sensor data to a simple online dashboard for visualization.*

AI + IoT

Instructor: Eng. Hugo Herrera

Description: *A follow-up to the IoT workshop, introducing participants to how simple AI techniques can be applied to data collected from IoT sensors to detect patterns or make basic predictions.*

Learning objectives: *Collect a small dataset using the IoT setup from the previous session; apply a simple, pre-built AI model to the collected data; and interpret the model's output in the context of the IoT use case (e.g., detecting an unusual reading).*

Virtual Reality I

Instructor: Victor Valencia

Description: *An introductory workshop on Virtual Reality development using a beginner-friendly game engine, covering the basics of building and navigating a simple 3D environment.*

Learning objectives: *Set up a basic VR/3D development environment; understand basic 3D concepts (scenes, objects, camera, lighting); build a simple 3D scene; and view the scene in a VR headset or desktop preview.*

Virtual Reality II

Instructor: Victor Valencia

Description: *A continuation of Virtual Reality I, focused on adding basic interactivity to a 3D scene and discussing how VR could be applied to participants' own project domains (e.g., training, rehabilitation, or visualization).*

Learning objectives: *Add a simple interactive element to a VR scene (e.g., an object that responds to user input); test the interaction in a VR headset or desktop preview; and brainstorm one possible VR application relevant to the participant's project.*

Digital Device Communications

Instructor: Daniel Benitez

Description: *An introductory workshop on how digital devices communicate with each other, covering common communication protocols used in embedded systems and IoT, with simple hands-on examples using a microcontroller.*

Learning objectives: *Understand the basic concepts of digital communication between devices; get an overview of common protocols (e.g., UART, I2C, SPI, Bluetooth) and where each is typically used; and complete a simple hands-on exercise sending data between two devices.*

Embedded Systems Design

Instructor: Daniel Benitez

Description: *An introductory, hands-on workshop on embedded systems: programming a microcontroller to read sensors and control simple actuators (e.g., LEDs, motors, buzzers), as a foundation for integrating electronics into participants' projects.*

Learning objectives: *Understand the basic parts of an embedded system (microcontroller, sensors, actuators, power); write and upload a simple program to a microcontroller; read a sensor value and use it to control a simple actuator; and discuss how this could be applied to the participant's project.*

Applied Research Methodologies

Instructor: Dr. Peñaloza

Description: *An introductory session on how to approach a technology project as a small applied research project: framing a clear question, planning a simple way to test an idea, and thinking about how to evaluate results. Designed to help participants structure the project work happening in the program.*

Learning objectives: *Formulate a clear research or project question for the participant's assigned topic; identify what would count as success or evidence of a working solution; outline a simple plan to test or evaluate the project concept; and discuss how to present results clearly to a non-specialist audience.*

Schedule at a Glance

(Schedule subject to change. All times are local Osaka time. Sessions run Monday through Friday only.)

Week 1 (Aug 3 – 7): Futures Design Sprint

Week	Monday	Tuesday	Wednesday	Thursday	Friday
Week 1	Introduction to Futures Design; team formation	Horizon scanning; Signals Safari	Alternative futures; Futures Wheel; preferred future	Speculative design; hands-on prototyping	Pitch preparation; team presentations; reflections

Week 2 (Aug 10 – 14): Neurotechnology, AI & Connected Systems

Week	Monday	Tuesday	Wednesday	Thursday	Friday
Week 2AM (10–13)	Seminar: Neurotechnology — Foundations (Dr. Peñaloza)	Workshop: Neurotech (Dr. Trenado)	Workshop: Artificial Intelligence I (Dr. Palafox)	Workshop: Artificial Intelligence III (Dr. Palafox)	Project work
Week 2PM (14–17)	Workshop: Developing Brain-Computer Interfaces	Seminar: Neurotechnology — Signal Processing (Dr. Trenado)	Workshop: Artificial Intelligence II (Dr. Palafox)	Workshop: Artificial Intelligence IV (Dr. Palafox)	Project work + weekly review

Week 3 (Aug 17 – 21): Robotics, Blockchain & Immersive Tech

Week	Monday	Tuesday	Wednesday	Thursday	Friday
Week 3AM (10–13)	Seminar: Robotics (Dr. Cruz-Ramírez)	Workshop: Robotics 1 (M.Sc. Rafael Hernández)	Workshop: Web Development (M.Sc. Rafael Hernández)	Seminar: Blockchain for Robotics (Eduardo Castelló Ferrer)	Workshop: Virtual Reality I (Victor Valencia)
Week 3PM (14–17)	Project & Problem Assignment Session: presentation	Workshop: Robotics 2 (M.Sc. Rafael Hernández)	Seminar: Robotics & Web Development	Project work	Workshop: Virtual Reality II (Victor Valencia)

	of project topics/challenges		(M.Sc. Rafael Hernández)		
Week 3Evening (17–18)	Project work	Project work	Project work	Project work	Project work + weekly review

Week 4 (Aug 24 – 28): Embedded Systems, Industry & Closing

Week	Monday	Tuesday	Wednesday	Thursday	Friday
Week 4AM (10–13)	Workshop: Internet of Things (Eng. Hugo Herrera)	Workshop: Digital Device Communications (Daniel Benitez)	Seminar: Industry Perspective — Latin America (Eduardo Espinoza)	Project work	Final project presentations
Week 4PM (14–17)	Workshop: AI + IoT (Eng. Hugo Herrera)	Workshop: Embedded Systems Design (Daniel Benitez)	Workshop: Applied Research Methodologies (Dr. Peñaloza)	Project work and presentation rehearsal	Closing Ceremony
Week 4Evening (17–18)	Project work	Project work	Project work	Project work	—

Application Guidelines

Program Dates & Location

Dates: August 3 – 28, 2026 (Monday – Friday only; no weekend sessions)
Location: Asia Pacific Trade Center, Nankoukita 2-1-10, Suminoe-ku, Osaka, Japan.
Language: English
Format: Seminars, hands-on workshops, and team/individual project work

Fee & Capacity

General	Student Discount Rate*
250,000 yen	150,000 yen

Seat capacity: 20 participants

- * Student Discount rate: Applies to students from Japanese institutions.
- The program fee includes workshops, seminars, instructional materials, and project components. Transportation and accommodation are not included.

How to Apply

[Placeholder: application website/portal link.]

Application deadline: August 25th, 2026

Part of the program or the whole program may be cancelled in case of insufficient enrollment or force majeure circumstances such as natural disasters.

Notes for Participants

- All sessions are conducted in English; participants should be comfortable working in an international team environment.
- Participants are expected to attend the full program (Mon–Fri, all four weeks).
- Participants should bring a laptop for workshops and project work.
- Upon acceptance, participants will be asked to sign a confidentiality / informed consent form related to project work and any technologies developed during the program.

Access Map

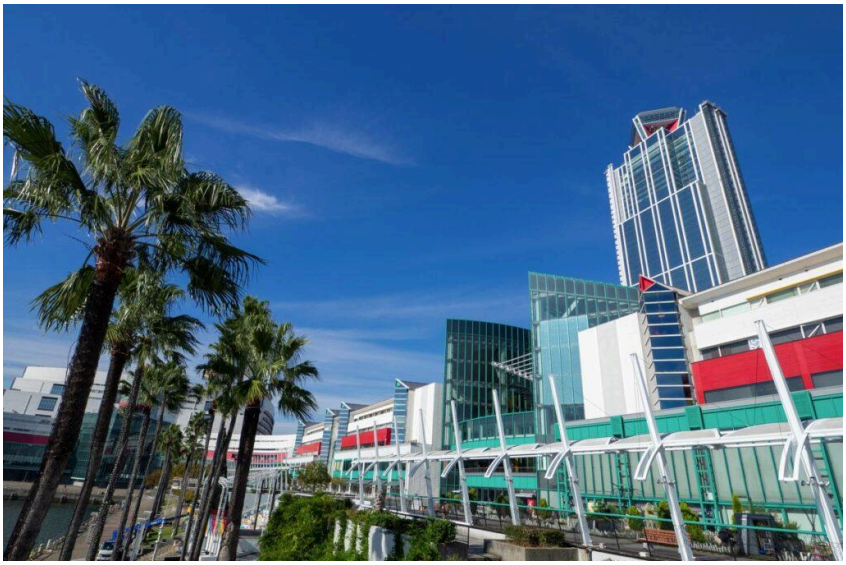
Mirai Innovation Research Institute — Laboratory Location

Address: ATC blg, ITM sec. 6th floor Rm. M-1-3 Nankoukita 2-1-10, Suminoe-ku, Osaka, Japan. 559-0034

Email: contact@mirai-innovation-lab.com

Phone: 06-6616-7897

Mirai Innovation Research Institute's Osaka facilities are accessible by train from major hubs including Shin-Osaka Station, Osaka (Umeda) Station, and Kansai International Airport via the Osaka Metro and JR / private rail lines serving central Osaka. Detailed step-by-step directions from the nearest station will be provided to accepted participants before the program begins.



Mirai Innovation Research Institute facilities in Osaka, Japan

A detailed access map / walking directions from the nearest train station to the program venue are described in the following link:
https://www.mirai-innovation-lab.com/directions-to-mirai-innovation-laboratory/

Evaluation & Grading

Participant performance is assessed across the program, with particular emphasis on the project work developed from Week 3 onward and the final presentation at the Closing Ceremony. Grades are based on a fixed standard, not on a curve: if the standard is met, every participant can achieve a high grade.

Grading Components

Component	Weight
Final Project / Project Proposal (content, technical execution, and documentation)	**40%**
Final Presentation (clarity, structure, use of English, response to Q&A)	**25%**
Workshop & Seminar Participation (engagement, completion of hands-on exercises)	**20%**
Futures Design Sprint Deliverables (Week 1: signals, scenarios, prototype, pitch)	**15%**

Point Distribution

Score	Grade	Score	Grade
95 – 100	**A**	77 – 79	**C+**
90 – 94	**A-**	73 – 76	**C**
87 – 89	**B+**	70 – 72	**C-**
83 – 86	**B**	60 – 69	**D**
80 – 82	**B-**	Below 60	**F**

Certificate of Completion

All participants who complete the program — attending the required sessions and submitting the final project / project proposal — will receive a Certificate of Completion issued by Mirai Innovation Research Institute, noting the program dates, content areas covered, and the participant's final project topic.

Contact

Email: contact@mirai-innovation-lab.com
Phone: 06-6616-7897