



Extreme Spaces Designing for Life in Extreme Environments

Edition :1

Academic Director of the Course: Annalisa Dominoni

Technical Director: Benedetto Quaquaro

Start date: October 12th2027

End date: December 17th2027

Number of hours: 45 hours

Delivery format: online (40 hours) and in-person (5 hours)

Language of instruction: English

Edition: 1

Location: POLI.design and online

Weekly commitment: The course format consists of online instruction in 2-hour sessions and in-person instruction in a 5-hour workshop session.

Partner: ESA_LAB@PoliMi

Price: €2,400

INTRODUCTION

Extreme Spaces – Designing for Life in Extreme Environments is an executive course that introduces participants to the design principles and approaches specific to extreme environments, using high-altitude environments as the case study for the first edition.

The course serves as a gateway to a complex and rapidly evolving field, providing an integrated overview of the environmental, behavioral, and systemic dynamics that characterize extreme conditions. Through multidisciplinary contributions from fields such as research, industry, emergency management, and technological innovation, participants will gain a structured understanding of decision-making and operational processes in highly critical contexts.

The program aims to develop a conscious design approach capable of interpreting complexity and transferring methods and tools to various professional fields.

LEARNING OBJECTIVES (Bloom's Taxonomy)

Recall

Recall basic concepts related to extreme environments, complex systems, and hazardous conditions.

Understand

Understand the environmental, behavioral, and operational dynamics that characterize extreme contexts.

Apply

Apply principles and tools to analyze real-world situations and interpret emergency scenarios.

Analyze

Analyze operational sequences, behaviors, and critical issues under conditions of stress and complexity.



Evaluate

Evaluate decisions, strategies, and design solutions in relation to risk, safety, and performance.

Create

Build design frameworks and response systems for extreme scenarios, integrating multidisciplinary knowledge.

REQUIRED BASIC SKILLS – REQUIRED SOFTWARE

No specialized skills in technical or scientific fields are required.

Basic training in design or technical fields, or equivalent professional experience, is required.

Familiarity with design processes, the management of complex systems, or professional activities in dynamic contexts is recommended.

TARGET AUDIENCE

The course is aimed at planners, architects, designers, professionals, and managers interested in acquiring basic skills and interpretive tools to operate in complex and extreme contexts.

It is particularly suitable for professionals seeking to explore the topic of extreme environments as a field for innovation and professional development, coming from sectors such as design, engineering, project management, innovation, and research.

The course is also designed for professionals in the process of repositioning their careers, interested in developing new cross-functional skills related to managing complexity, resilience, and behavior under extreme conditions.

TEACHING PLAN (45 hours)

THEORETICAL MODULE – Introduction to Extreme Environments

Hours: 2

Delivery method: Online

Description:

This module introduces the concept of extreme environments as complex systems, defining the main risk factors, vulnerabilities, and interactions between the environment and human behavior. High altitude is presented as a case study for the first edition.

Main contents:

- Definition of Extreme Environments
- High altitude as an extreme system
- Vulnerability and risk
- Environment–behavior relationship

THEORETICAL MODULE – Extreme Environments: High Altitude Systems



Hours: 8

Delivery method: Online

Description:

This module explores the context of high altitude through the analysis of real-world scenarios, highlighting environmental conditions, operational challenges, and intervention dynamics.

Main contents:

- Environmental conditions at high altitude
- Operational scenarios
- Risk and safety
- Case studies

THEORETICAL MODULE – Human Behavior & Performance Under Stress

Hours: 8

Delivery method: Online

Description:

Analysis of human behavior under stress through real-world cases, with a focus on performance, decision-making, and cognitive decline.

Main topics:

- Environmental and cognitive stress
- Decision making
- Fatigue and error
- Performance in emergencies

THEORETICAL MODULE – Use & Gesture Design

Hours: 2

Delivery method: Online

Description:

Introduction to the Use & Gesture Design (UGD) methodology, with a focus on the behavioral dimension, operational sequence, and systemic analysis of the project under extreme conditions.

Main topics:

- Gesture and micro-action
- Operational sequence
- Error and adaptation
- UGD framework

THEORETICAL MODULE – Mission Design & Decision Systems

Hours: 8

Delivery method: Online

Description:



This module introduces the principles of mission planning and management in extreme environments, emphasizing the systemic and decision-making aspects.

Main topics:

- Mission planning
- Logistics
- Coordination
- Decision-making systems

THEORETICAL MODULE – Technologies for Extreme Conditions

Hours: 8

Delivery method: Online

Description:

Presentation of technologies and support systems for extreme environments, through concrete examples and application cases.

Main contents:

- Wearable technologies
- Parameter monitoring
- Support systems
- Technological innovation

THEORETICAL MODULE – Extreme Analogues: From Antarctica to Space

Hours: 4

Delivery method: Online

Description:

Analysis of extreme terrestrial environments as analogues to space, with a focus on Antarctica.

Main content:

- Analogue environments
- Isolation and confinement
- Earth-to-space transfer

DESIGN MODULE / WORKSHOP – Extreme Design Lab: High Altitude Scenario

Hours: 5

Delivery method: In-person

Description:

Development of a design scenario related to high altitude, applying the acquired knowledge and constructing a design framework.

Main content:

- Emergency scenario
- Behavioral analysis
- Sequence breakdown
- Design framework



ASSESSMENT METHODS

At the end of the course, an assessment must be conducted to verify the acquisition of competencies.

The assessment may be based on:

- Qualitative assessment (e.g., achieved, partially achieved, not achieved)

OPPORTUNITIES AND OUTCOME PROFILE/COMPETENCIES

Refer to the professional profiles defined by ESCO (European Skills, Competences, Qualifications and Occupations) and/or the Lombardy Region and/or other organizations specific to the relevant sector

The course enables the development of transferable skills applicable to professional contexts characterized by high complexity, risk, and operational variability.

Participants will be able to work in areas such as:

- design and consulting for extreme environments
- management and planning of complex systems
- innovation and project management in highly critical contexts
- development of solutions for safety and resilience
- research and technology transfer

The skills acquired align with the following ESCO profiles:

- Project Manager
- Innovation Manager
- Product/Service Designer
- Systems Designer
- Risk and Safety Specialist

COURSE SCHEDULE

The course consists of 45 hours, for a total of 21 sessions spread over 10 weeks.

The format includes:

- 2 online sessions per week (Tuesdays from 5:00 PM to 7:00 PM and Thursdays from 5:00 to 7:00 pm) for a total of 40 online hours.
- 1 final in-person workshop session (Fridays from 2:00 PM to 7:00 PM) for a total of 5 in-person hours.



The course will take place on the following dates:

Delivery method	Date	Teaching	Week's day	Time	Hours
online	12/10/2027	Introduction to Extreme Environments	Tuesday	5:00 PM–7:00 PM	2
online	14/10/2027	Extreme Environments: High Altitude Systems	Thursday	5:00 PM–7:00 PM	2
online	19/10/2027	Extreme Environments: High Altitude Systems	Tuesday	5:00 PM–7:00 PM	2
online	21/10/2027	Extreme Environments: High Altitude Systems	Thursday	5:00 PM–7:00 PM	2
online	26/10/2027	Extreme Environments: High Altitude Systems	Tuesday	5:00 PM–7:00 PM	2
online	28/10/2027	Human Behaviour & Performance Under Stress	Thursday	5:00 PM–7:00 PM	2
online	02/11/2027	Human Behaviour & Performance Under Stress	Tuesday	5:00 PM–7:00 PM	2
online	04/11/2027	Human Behaviour & Performance Under Stress	Thursday	5:00 PM–7:00 PM	2
online	09/11/2027	Human Behaviour & Performance Under Stress	Tuesday	5:00 PM–7:00 PM	2
online	11/11/2027	Use & Gesture Design	Thursday	5:00 PM–7:00 PM	2
online	16/11/2027	Mission Design & Decision Systems	Tuesday	5:00 PM–7:00 PM	2
online	18/11/2027	Mission Design & Decision Systems	Thursday	5:00 PM–7:00 PM	2
online	23/11/2027	Mission Design & Decision Systems	Tuesday	5:00 PM–7:00 PM	2
online	25/11/2027	Mission Design & Decision Systems	Thursday	5:00 PM–7:00 PM	2



online	30/11/2027	Technologies for Extreme Conditions	Tuesday	5:00 PM–7:00 PM	2
online	02/12/2027	Technologies for Extreme Conditions	Thursday	5:00 PM–7:00 PM	2
online	07/12/2027	Technologies for Extreme Conditions	Tuesday	5:00 PM–7:00 PM	2
online	09/12/2027	Technologies for Extreme Conditions	Thursday	5:00 PM–7:00 PM	2
online	14/12/2027	Extreme Analogues: From Antarctica to Space	Tuesday	5:00 PM–7:00 PM	2
online	16/12/2027	Extreme Analogues: From Antarctica to Space	Thursday	5:00 PM–7:00 PM	2
In person	17/12/2027	Extreme Design Lab: High Altitude Scenario – in presenza	Friday	2:00 PM–7:00 PM	5

PAYMENT

You may pay using one of the following methods:

Bank Transfer

Please make the payment using the following bank details:

POLI.design Srl

C/O BANCA INTESA SANPAOLO

Branch: Piazza Paolo Ferrari, 10 – 20121 Milan, Italy

BIC / SWIFT: BCITITMM

IBAN: IT28M0306909606100000176368

Payment reference: Course name and participant's full name.

A copy of the payment receipt must be sent to: iscrizioni@polidesign.net.

Online Credit Card Payment

Payment by credit card can be made through the reserved area of the POLI.design website by requesting access via: iscrizioni@polidesign.net.

COST

The total fee for the Course is €2,400 per student.

CERTIFICATION AWARDED

At the end of the Course, participants will receive an Open Badge for the Executive Course in “Extreme Spaces – Designing for Life in Extreme Environments” issued by POLI.design.

MINIMUM ATTENDANCE REQUIREMENT TO OBTAIN THE CERTIFICATION

POLI.design
Società consortile
a responsabilità limitata

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Attendance is mandatory for at least 80% of the course.

INFORMATION AND CONTACTS

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