Course Catalogue

Autumn 2025

International Innovation and Entrepreneurship Program

Courses

学分类型 Credit type	课程编号 Code	课程名称 Course Name	课时 Hours in class	总课时（包括自学课时） Total hours (including personal work)	学分 ECTS	必修/选修 Compulsory or optional	学期 Period
TM	UM09	1. Agile Project Management	40	80	4	Compulsory	Autumn and Winter
TM	UM01	2. IoT Prototyping Bootcamp	50	70	4	Compulsory	Winter
TSH/TM	IE01	3. Entrepreneurship in China	60	120	6	Compulsory	Autumn and Winter
TSH/TM	IE02	4. Design Thinking and Rural Innovation Bootcamp	36	65	3	Compulsory	Autumn
TSH	IE03	5. ESG for Engineering and Entrepreneurship	20	40	2	Compulsory	Autumn and Winter
TSH	UL04	6. Chinese Mandarin for beginners LCIE	90	180	6	Compulsory	Autumn and Winter
	UL05	Chinese Mandarin intermediate	90	180	6		
	UL06	Chinese Mandarin advanced LCIE	90	180	6		
TM	AI01	7. AI for Product Development	32	32	2	Compulsory	Autumn or

							Winter
TM	**UM20**	**8. Alicloud Generative AI (Online)**	**10**	**20**	**1**	**Compulsory**	**Autumn or Winter**
CS	SR01	1. Scientific Research Project	10	96	6	Optional	Autumn and Winter
TM	EG01	2. Engineering Project	10	96	6	Optional	Autumn and Winter
TM/CS	SR02	3. Research Engineer Assistantship	10	96	6	Optional	Autumn and Winter
TM	3ZSL125001	4. Industrial Robot Technology and Applications in the Smart Factory	48	96	3	Optional	Autumn
TM	3ZSL125009	5. Introduction to CPS	48	96	3	Optional	Autumn
TSH	1ZSL125002	6. Between technic and society	32	64	2	Optional	Winter

Course Description

Compulsory Courses

1. Agile Project Management

This comprehensive course introduces students to the dynamic world of Agile project management, a methodology that has revolutionized the way teams approach complex projects. At its core, Agile emphasizes adaptability, collaboration, and iterative progress, enabling teams to respond effectively to changing requirements and market conditions.
Students will explore the fundamental principles of Agile, including the concept of "sprints" - short, focused periods of work typically lasting 1-4 weeks.

Practical skills like creating and managing product backlogs, conducting daily stand-up meetings, and facilitating sprint retrospectives will be honed through hands-on exercises. A significant portion of the course is dedicated to applying Agile principles to real-world innovation projects, allowing students to experience firsthand the benefits and challenges of this approach. To simulate the unpredictable nature of real projects, students will face various scenarios inspired by actual situations, requiring them to adapt their strategies and demonstrate agility in decision-making.

By the end of the course, participants will be well-equipped to implement Agile practices in their own projects and organizations.

2. IoT Prototyping Bootcamp

The aim of this course is to immerse students in the rapid prototyping ecosystem. Students will gain hands-on experience in turning ideas into tangible products through intensive prototyping sessions.

Key aspects of the course include:

- Exploring electronics markets and manufacturing facilities
- Learning cutting-edge prototyping techniques using state-of-the-art equipment
- Collaborating with engineers and designers to overcome technical challenges
- Developing a hardware prototype from initial concept to functional model
- Understanding the iterative process of product development and refinement
- Gaining insights into sourcing components and managing a global supply chain
- Applying lean startup methodologies to hardware development

Students will work in teams to create prototypes for their own innovative product ideas. This practical experience will not only enhance their technical skills but also provide valuable insights into the challenges and opportunities of hardware innovation in a global context.

3. Entrepreneurship in China

This immersive course is designed to provide students with a comprehensive, hands-on experience in entrepreneurship within the dynamic Chinese business ecosystem. The primary objective is to place students in authentic entrepreneurial scenarios, bridging the gap between theoretical knowledge and practical application. The curriculum covers essential topics such as start-up management, business plan development, and strategic partner acquisition, all tailored to the Chinese business landscape.

A distinguishing feature of this course is its emphasis on experiential learning; students will form teams and launch their own start-ups, applying the theories and strategies discussed in class to real-world situations. Beyond individual entrepreneurship, the course aims to equip students with versatile skills applicable across various roles within the innovation ecosystem. Graduates will be well-prepared to contribute effectively as entrepreneurs, or to pursue careers in related fields such as venture capital, incubator management, intellectual property consultation, or design strategy. Through a combination of lectures, case studies, guest speakers from successful Chinese start-ups, and hands-on project work, students will gain a holistic understanding of entrepreneurship in China, positioning them for success in the ever-evolving global business environment.

The course promotes a hands-on approach and requires students to build their projects and present something concrete. Indeed, students do not only need to come up with ideas and create a business plan, they also have to work on the technical aspects of their product, build a prototype, think about the possible ways to industrialize it, create a website/mini app, etc…

4. Design Thinking and Rural Innovation Bootcamp

This course introduces students to the powerful methodology of design thinking and its practical application in rural innovation. Design thinking is a human-centered approach to problem-solving that emphasizes empathy, creativity, and iterative development. Students will learn the five phases of the design thinking process: Empathize, Define, Ideate, Prototype, and Test. Through hands-on exercises and case studies, participants will develop skills in user research, problem framing, brainstorming techniques, rapid prototyping, and user testing. The course will explore how design thinking can be particularly effective in addressing ill-defined or complex challenges often found in rural settings. In the latter part of the course, students will participate in a rural innovation bootcamp, where they will apply their newly acquired design thinking skills to real-world problems faced by rural communities. Working in teams, students will engage with local stakeholders, identify key challenges, and develop innovative solutions tailored to the specific needs and constraints of rural environments. This immersive experience will not only reinforce the principles of design thinking but also foster an understanding of rural development issues and the potential for innovation in these contexts. By the end of the course, students will have gained practical experience in applying design thinking methodologies and will have developed their first set of innovative ideas aimed at improving rural life and livelihoods.

5. ESG for Engineering and Entrepreneurship

Human activities have led to environmental destruction and a growing disconnection from nature, exacerbated by urbanization and technological advancements. This separation is further compounded by social constructs that divide humanity. Modern development is effectively "producing nature," altering our relationship with it from one of harmony to attempted control. While science and technology aim to address environmental challenges, they often inadvertently create new risks, as seen in increased flooding due to land-use changes and heightened earthquake risks from practices like fracking. The emergence of biological threats such as pandemics highlights nature's dynamic and unpredictable character. Mainstream scientific thought presents a contradictory view of humanity as both integral to and separate from nature. In light of these complex issues, this module delves into the role of engineering within the broader Environmental Social Governance (ESG) discourse. Students are encouraged to engage in critical thinking and reflection, examining how engineering practices impact both natural systems and society at large, with the goal of fostering more sustainable and responsible approaches to technological advancement and environmental management.

6. Chinese Mandarin LCIE

This course is designed to introduce students to the fundamentals of the Chinese language, focusing on developing proficiency in listening, speaking, reading, writing, and translating. Students will learn basic Chinese phonetics, including tones and pronunciation, to build a foundation for accurate speech. The curriculum covers essential vocabulary for everyday conversations, allowing students to communicate in common situations. Elementary Chinese grammar structures and sentence patterns will be introduced to help students construct simple phrases and sentences. Students will also begin learning to read and write common Chinese characters, starting with basic strokes and progressing to simple texts. Throughout the course, cultural elements will be integrated to provide context and enhance understanding of the language in its native setting. Interactive classroom activities, multimedia resources, and regular practice exercises will be employed to reinforce learning. By the end of the course, students will have gained a solid foundation in Chinese language skills, enabling them to engage in basic communication and preparing them for more advanced study.
More advanced Chinese classes can be provided to students with a higher Chinese level.

7. AI for Product Development

AI for Product Development equips undergraduate engineering students with the knowledge and skills to leverage artificial intelligence throughout the product development lifecycle. This course bridges the critical gap between theoretical AI concepts and their practical application, preparing students to innovate in the evolving engineering landscape.

The curriculum provides a robust foundation in AI principles, including machine learning and deep learning, with a specific focus on their relevance to engineering. Students will learn to critically evaluate the capabilities and limitations of AI tools, understanding when they are an appropriate solution within the development cycle. A key emphasis is placed on developing a systematic framework for assessing the data requirements and ethical implications of AI deployment.

A central component of the course is hands-on, applied learning. Students will gain direct experience using AI techniques to solve real-world engineering problems. This includes implementing predictive modeling to forecast product performance and utilizing generative AI for tasks like design optimization and simulation. Through practical projects, students will document the process of deploying AI-driven solutions, demonstrating proficiency from concept to outcome.

Upon completion, students will be able to formulate a structured approach for integrating AI into product development, apply relevant tools effectively, and critically assess their impact. The course aims to create proficient, ethical engineers who can harness AI to drive efficiency, foster innovation, and build the next generation of intelligent products.

8. Alicloud Generative AI

This comprehensive program offers a deep dive into the world of Generative AI, focusing on its applications in cloud computing. The course is structured into eight modules, covering a range of topics from foundational concepts to advanced applications. Students will explore the ethics and responsible use of Generative AI, delve into the intricacies of large language models, and gain hands-on experience in deploying GenAI applications on cloud platforms like ECS and PAI. The curriculum emphasizes practical skills, including prompt engineering and making GenAI work in real-world scenarios. With a total duration of 23 hours, the course provides a balanced mix of theoretical knowledge and applied learning. Designed for aspiring AI engineers, this program aims to equip participants with the skills needed to leverage the power of foundation models in today's competitive job market. Upon completion, students will be well-prepared to imagine, learn, and apply Generative AI technologies in various cloud-based contexts.

Optional Courses

#1 — SR01 - Scientific Research Project (CS Category – Scientific Knowledge)

This course immerses students in the practice of scientific inquiry and research methodology under the supervision of a UTSEUS or partner-laboratory researcher. Working in small teams (1–3 students), they contribute to an ongoing research question in fields such as materials, AI, urban engineering, or sustainable systems. The project develops from the initial problem formulation to the final writing of a scientific paper following international academic standards. The goal is to train engineers capable of engaging in critical, evidence-based reasoning and contributing to innovation through scientific rigor.

Skills developed (aligned with RNCP and CTI referential)

- Apply scientific reasoning and research methodology to a defined engineering problem.
- Conduct literature reviews and analyze scientific sources with critical judgment.
- Design and implement experimental or computational studies respecting ethical and methodological standards.
- Process, analyze, and interpret scientific data using appropriate tools.
- Write and format a scientific article in accordance with academic publication standards.
- Present and defend research findings with clarity and rigor in an intercultural research environment.

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#2 — EG01 - Engineering Project (TM Category – Techniques and Methods)

This course provides hands-on experience in engineering project management by engaging teams (1–3 students) in real-world projects proposed by industrial or institutional partners of UTSEUS. Students design, model, and implement solutions that integrate technology, innovation, and quality management principles. The course follows a project-based learning approach where students manage the full life cycle—from needs analysis to prototype or implementation—emphasizing teamwork, innovation, and professional responsibility.

Skills developed (aligned with RNCP and CTI referentials)

- Manage an engineering project, including planning, budgeting, and quality assurance.
- Apply engineering methods, modeling, and design tools to solve practical problems.
- Implement technical solutions (software, hardware, systems) respecting industrial standards and sustainability goals.
- Use project management tools (e.g., Gantt, Agile) and ensure team coordination.
- Communicate technical results effectively to industrial and academic stakeholders.
- Demonstrate autonomy, accountability, and professional ethics in an international working context.

#3 — SR02 - Research Engineer Assistantship (TM/CS Hybrid Category)

This course places the student as an assistant to a research master's student or doctoral researcher. Under their supervision and that of a faculty mentor, the student contributes to an ongoing master thesis or research experiment. The assistant participates in data collection, experiment design, result analysis, and technical reporting. The focus is on acquiring the rigor, analytical depth, and teamwork required in high-level research and innovation environments.

Skills developed (aligned with RNCP and CTI referential)

- Assist in planning and executing experimental or simulation protocols.
- Collect, document, and analyze scientific and technical data with precision.
- Contribute to the interpretation and presentation of research outcomes.
- Understand and apply safety, ethics, and data integrity standards in a research environment.
- Communicate progress and findings within a research team using professional documentation formats.
- Collaborate effectively across cultures and disciplines in an academic laboratory environment.

#4 — Industrial Robot Technology and Applications in the Smart Factory

Purpose

This module aims to provide a systematic introduction to the core principles, key technologies, and cutting-edge applications of industrial robotics. By combining theoretical instruction with simulation practice, students will be able to:

1. Understand Fundamentals: Grasp the basic concepts, classification, performance parameters of industrial robots, and their role within the smart manufacturing ecosystem.
2. Master Architecture: Become familiar with robot mechanical structures, kinematic models, drive systems, and control systems, establishing a theoretical foundation for subsequent programming and application.
3. Master Simulation & Programming: Proficiently use mainstream robot simulation software for robot cell modeling, offline programming, and virtual commissioning, significantly improving engineering efficiency and reducing risk.

4. Achieve Interconnectivity: Understand how industrial robots communicate and exchange data with other systems in the smart factory (e.g., MES, PLC, sensor networks) using standard communication protocols (e.g., OPC UA, Modbus TCP/IP, EtherCAT), enabling cyber-physical integration.
5. Plan and Apply: Be capable of planning, designing, and analyzing robot workcells for typical application scenarios in a smart factory (e.g., flexible assembly, intelligent sorting, human-robot collaboration).

The ultimate goal of this course is to cultivate versatile engineering professionals capable of undertaking tasks in robot system integration, programming, debugging, operation, maintenance, and application within smart factories.

#5 — Introduction to CPS

Course Objective(s)
This course intends to present concepts, definition and tools for developing CPS. It presents Cyber-Physical Systems as smart systems that include engineering interacting networks of physical and computational components.

The course covers major concepts linked to CPS such as Applications, Design methodologies and feedback systems.

This course introduces the fundamentals of Cyber-Physical Systems (CPS) with a focus on autonomous systems and IoT-enabled technologies. Students will learn to analyze and design connected systems involving planning, control, and decision-making for mono and multi-vehicle systems. The course also covers communication protocols, robotic kinematics, and computer vision techniques, with practical implementation through Cisco Packet Tracer to simulate IoT networks, data collection, and automation scenarios.

Course Introduction
Cyber-Physical Systems (CPS) represent a new generation of engineered systems that tightly integrate computation, networking, and physical processes. This course provides a comprehensive introduction to CPS, focusing on the design, operation, and communication of intelligent systems that interact with the physical world. Particular emphasis is placed on autonomous mono- and multi-vehicle systems (MVS), their planning, control, and decision-making processes.

Students will explore the foundations of the Internet of Things (IoT), including network architecture, communication protocols, and the criteria used to evaluate different technologies such as Sigfox, BLE, Zigbee, and LoRa. The course also introduces key robotics concepts, including kinematic modeling and computer-aided vision, essential for perception and control in modern CPS.To bridge theory and practice, students will engage in hands-on sessions using Cisco Packet Tracer. These labs will simulate real-world IoT scenarios, enabling students to design, configure, and manage connected systems involving sensors, actuators, and automation rules.

#6 — Between science, technology and society

Course Objective(s)

This course will examine the complex relationship between technology and science in their often interdependent Western and Eastern and now Northern and Southern trajectories. Main attention will be paid to historical, social, and institutional determinants, including in various configurations of power and authority. A particular emphasis will be placed on the complexity of possible hazards, on conceptual risk-taking and innovation in the management of new technologies. The other characteristic of the course is a systematic comparative point of view between Chinese and Western European framework.

Course Introduction

This course explores how major disruptive events such as the birth of sophisticate techniques, of modern science, of industrial take-off, up to globalization in the end of XXth are complex, multidimensional processes. It examines the kind of problems States, Firms, Institutions, Cultures have had to deal with the challenge of catching up economic development, responding to social contradictions. Historical case studies will provide elements to anticipate the problems of the near future. This comparative approach helps to broaden the typology of situations and responses. The course places particular emphasis on the roles of various actors involved and the instruments they use to anticipate, respond to, and manage these scenarios. Ultimately, it encourages a critical view of current practices and fosters the development of more effective, interdisciplinary strategies for addressing complex global challenges.