UTSEUS
上海大学中欧工程技术学院
Université de technologie
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Innovation Courses Catalogue

Spring 2027

Courses Description

Design Thinking

Code	Period	credits	Category
	Innovation I	2	Humanities

Students will learn the whole process of design thinking: how to brainstorm, formulate and reformulate an idea, and pivot. The class will have a small workshop where students will form groups and design an object. This course introduces engineers to the principles and practices of Design Thinking, a human-centered approach to innovation. Over the duration of the program, students will engage in a series of workshops and hands-on activities that blend theoretical knowledge with practical application to initiate their startup creation process.

The course is based on anthropology and focuses on defining problems from a human perspective, conducting brainstorming, ideating potential solutions, prototyping their ideas, and testing them iteratively. The curriculum emphasizes collaboration, creativity, and critical thinking, enabling students to tackle complex challenges in novel ways. Students will emerge with a robust toolkit and enhanced problem-solving skills, capable of applying Design Thinking methodologies in their professional contexts.

Theoretical Knowledge or Skills:

1. Gain knowledge about how to deeply understand the needs and experiences of users through methods such as interviews, observations, and surveys.
2. Learn to reframe problems from a human-centered perspective, moving beyond technical specifications to identify real user needs and pain points.
3. Understand various ideation strategies like brainstorming, mind mapping, and lateral thinking to generate innovative solutions.

Applied Knowledge or Know-How:

1. Experience creating prototypes using different materials and technologies, from low-fidelity sketches to digital models, to effectively communicate and test ideas.

2. Conduct tests with users, gather feedback, and iterate designs based on real-world interactions and reactions.
3. Leverage diverse team dynamics by learning to work collaboratively, utilizing different perspectives and skill sets to enhance creativity and solve problems more effectively.

Mindset:

1. Cultivate an attitude of continuous learning, resilience, and adaptability, embracing failure as a part of the learning process rather than a setback.

Sustainability in Engineering

Code	Period	credits	Category
	Innovation I	2	Humanities

This course is designed to introduce general engineering students to the foundational principles and practical applications of sustainability within the field of engineering. The curriculum is structured to provide a comprehensive overview of how sustainability can be integrated into every aspect of engineering design and decision-making processes.

Through a combination of lectures, case studies, and hands-on activities, students will explore the multifaceted nature of sustainability. The course begins by establishing a solid theoretical foundation, covering the fundamental concepts of sustainability, including the triple bottom line (environmental, social, and economic dimensions). It then delves into the application of these principles, illustrating how they can be implemented in real-world scenarios.

Key Topics Covered includes :

Environmental Impact Assessment: Students will learn methodologies for assessing the environmental impact of engineering projects, including life cycle analysis, material selection, and energy efficiency considerations.

Social Responsibility: The course addresses the social dimension of sustainability, emphasizing the importance of stakeholder engagement, ethical considerations, and community impact assessments.

Economic Viability: Economic aspects of sustainability are explored, including cost-benefit analysis, lifecycle costing, and strategies for achieving long-term financial viability while minimizing negative environmental and social impacts.

Systems Thinking: Students will develop an understanding of systems thinking, which is crucial for recognizing the interconnectedness of ecological, social, and economic factors. This holistic approach enables engineers to design resilient and adaptable solutions to changing conditions.

Sustainable Project Evaluation: The course includes modules on how to evaluate the sustainability of projects, covering metrics, standards, and certifications relevant to sustainable engineering practices.

Theoretical Knowledge or Skills:

1. Understand the core concepts of sustainability, including the triple bottom line (environmental, social, and economic dimensions).
2. Apply systems thinking to analyze the interconnections between different elements of engineering projects.
3. Evaluate the environmental impact of engineering projects using life cycle assessment methodologies.

Applied Knowledge or Know-How:

1. Implement strategies for reducing the ecological footprint of engineering designs, such as material selection and energy efficiency improvements.
2. Assess engineering projects' social and economic impacts, engaging with stakeholders and communities to ensure responsible practices.
3. Design sustainable solutions integrating renewable resources and promoting circular economy principles.

Mindset:

1. Embrace a holistic view that considers long-term sustainability goals over short-term gains, fostering a commitment to ethical and responsible engineering practices

Innovation Bootcamp

Code	Period	credits	Category
	Innovation I	4	Methodology

Innovate to Pitch is a dynamic and immersive one-week boot camp designed to equip undergraduate students with the essential skills and knowledge required for innovation management. Drawing from the ISO standards on innovation, the course integrates theoretical concepts with hands-on practice to provide a comprehensive understanding of exploiting new ideas to realize value successfully.

The boot camp is structured to mirror the real-world process of bringing an innovative idea to market, guiding students through the phases of design thinking, ideation, pain point identification, prototyping, and business planning. Participants will work in teams to develop a tangible solution to a real-world problem, culminating in a final pitch to a panel of business angels.

Learning Objectives:

1. Understand the ISO standard definition of innovation and the components of an innovation management system (IMS).
2. Apply design thinking methodologies to identify user needs and define problems.
3. Master ideation techniques to generate creative solutions.
4. Identify and articulate key pain points in the user experience.
5. Create and refine prototypes using a variety of tools and methods.
6. Develop a comprehensive business plan that includes market analysis, financial projections, and a value proposition.
7. Craft and deliver a compelling pitch to potential investors.

Course Structure:

- Day 1: Introduction to Innovation Management
- Day 2: Ideation & Pain Point Identification
- Day 3: Prototyping & Business Plan Basics
- Day 4: Advanced Prototyping & Business Plan Development
- Day 5: Final Pitch & Feedback

By the end of the boot camp, students will have:

- Developed a deep understanding of innovation management principles.
- Experienced the entire lifecycle of innovation, from ideation to prototyping.
- Created a business plan for a viable startup idea.
- Practiced pitching to potential investors.
- Gained valuable feedback from business angels and peers.

This structured approach ensures that students not only grasp the theoretical aspects of innovation management but also gain practical experience that prepares them for real-world entrepreneurship.

Theoretical Knowledge or Skills:

1. Define the core principles of innovation according to ISO standards, including the successful exploitation of new ideas to realize value.
2. Identify the critical elements of an innovation management system (IMS), such as organizational context, leadership commitment, formal planning, and continuous improvement.
3. Understand the stages of design thinking—empathize, define, ideate, prototype, and test—and their application in solving real-world problems.

Applied Knowledge or Know-How:

1. Apply ideation techniques to generate a range of creative solutions that address identified pain points.
2. Develop prototypes using a variety of tools and methods, from sketches to digital models, to communicate and test ideas effectively.
3. Craft a comprehensive business plan that includes market analysis, financial projections, and a clear value proposition, culminating in a compelling pitch.

Mindset:

1. Cultivate an entrepreneurial mindset that embraces risk-taking, iterative learning, and continuous improvement, fostering resilience and adaptability in the face of challenges.

Winning Business Plans

Code	Period	credits	Category

	Innovation I	2	Humanities

This course is designed to guide students through the essential elements of building a successful business, culminating in the creation of a comprehensive business plan. Students will explore core business plan sections, the ecosystem of innovation and venture capital, and the fundamentals of open entrepreneurship. The curriculum integrates key economics, accounting, finance, and psychology concepts to provide a holistic understanding of the business landscape.

Course Objectives:

- Develop a viable business plan that includes market analysis, technology assessment, business model formulation, and team composition.
- Understand the dynamics of innovation ecosystems and the role of venture capital
- Apply principles of open entrepreneurship to leverage diverse talents in technology, marketing, and business.
- Gain confidence in approaching business, startups, and investment complexities.

Key outcomes:

- Developed a deep understanding of the critical components of a successful business plan.
- Acquired practical skills in market analysis, financial planning, team building, and startup team successful organizations.
- Gained insights into the innovation ecosystem and the role of venture capital.
- Prepared a comprehensive business plan for presentation to potential investors.

This structured approach ensures that students not only grasp the theoretical aspects of business planning but also gain practical experience that prepares them for real-world entrepreneurship.

Theoretical Knowledge or Skills:

1. Analyze market dynamics, including customer segmentation, competitor analysis, and industry trends.
2. Evaluate a proposed product or service's technological feasibility and competitive advantages.
3. Construct a business model using frameworks like the Business Model Canvas, identifying key partners, activities, value propositions, customer relationships, channels, and cost structures.

Applied Knowledge or Know-How:

1. Develop financial projections to assess a business's economic health and sustainability, including income statements, cash flow statements, and balance sheets.
2. Formulate a comprehensive marketing strategy that includes positioning, branding, and promotional tactics to reach and retain customers.
3. Build a cohesive and effective team by identifying critical roles, recruiting talent, and fostering a positive organizational culture that supports innovation and collaboration.

Mindset:

1. Embrace an entrepreneurial mindset characterized by resilience, adaptability, and a proactive approach to identifying and seizing opportunities in the market.

AI for Product Development

Code	Period	credits	Category
	Innovation I	2	Humanities

This course is designed to provide undergraduate engineering students with a comprehensive understanding of how artificial intelligence (AI) can be leveraged in the product development lifecycle. The course integrates theoretical knowledge with practical applications, giving students the skills and confidence to use AI tools effectively in their future careers.

Course Objectives:

- Develop a robust understanding of AI models, their workings, and capabilities, enabling efficient and intelligent usage.
- Apply a systematic thinking framework to evaluate the appropriateness and application of AI in product development projects.
- Gain hands-on experience using various AI tools, including predictive and generative AI, in different stages of product development.

Key Outcomes:

- Developed a solid foundational understanding of AI tools and their applications in product development.

- Acquired practical skills in using AI for predictive modeling, design generation, and simulation.
- Formulated a structured approach to evaluating the suitability of AI for various product development tasks.
- Gained experience in applying AI tools to solve real-world engineering problems.
- Established a critical and ethical perspective on the use of AI in engineering contexts.

This course aims to prepare students to be proficient users of AI in product development, equipping them with the theoretical knowledge and practical skills necessary to innovate and succeed in the evolving landscape of engineering and technology.

Theoretical Knowledge or Skills:

1. Understand the fundamental concepts of AI, including machine learning, deep learning, and natural language processing, and their relevance to engineering and product development.
2. Evaluate the capabilities and limitations of AI tools, recognizing when they are most appropriately applied within the product development cycle.
3. Analyze AI application data collection and preprocessing requirements, ensuring data quality and suitability for intended use cases.

Applied Knowledge or Know-How:

1. Implement predictive modeling techniques, such as regression and classification, to forecast product performance and predict maintenance needs.
2. Utilize generative AI tools for design optimization and simulation, enhancing product functionality.
3. Deploy AI-driven solutions in practical product development projects, documenting the process and outcomes to demonstrate proficiency.

Mindset:

1. Adopt an ethical and responsible approach to AI integration, considering the implications of bias, fairness, and transparency in AI-driven product development.

Agile Project Management

Code	Period	credits	Category

	Innovation I	2	Humanities

This course introduces students to agile project management methodologies and emphasizes the advantages of this approach for startup and innovation management. Students will learn how to apply agile principles and practices to manage projects efficiently, respond to change rapidly and foster a culture of continuous improvement. The course includes both theoretical instruction and practical application, with students working on their own innovation projects throughout the semester. Real-life events and scenarios will be simulated to provide an authentic startup experience.

Course Objectives:

- Understand the core principles and practices of agile project management.
- Apply agile methodologies to manage innovation projects effectively.
- Evaluate the benefits and challenges of agile approaches in startup environments.
- Develop an agile mindset that fosters adaptability, collaboration, and continuous learning.
- Simulate real-life startup events to enhance decision-making and problem-solving skills.

Key Outcomes:

- Developed a comprehensive understanding of agile project management principles and practices.
- Acquired practical skills in applying agile methodologies to manage innovation projects.
- Built an agile mindset that emphasizes flexibility, collaboration, and continuous improvement.
- Experienced the dynamics of startup environments through simulated real-life events.
- Prepared a final project presentation that showcases their ability to manage an innovation project using agile principles.

This course is designed to equip students with the theoretical knowledge and practical skills needed to thrive in fast-paced, innovative environments, whether in startups or larger organizations.

Theoretical Knowledge or Skills:

1. Understand agile methodologies' core principles and values, including the Agile Manifesto and the Scrum framework.
2. Analyze the differences between traditional project management and agile approaches, highlighting the benefits of agility in dynamic environments.

3. Evaluate the role of critical agile artifacts such as user stories, product backlogs, and sprint planning meetings in facilitating effective project management.

Applied Knowledge or Know-How:

1. Implement sprint cycles, including planning, execution, review, and retrospective sessions, to manage projects efficiently.
2. Use agile tools and platforms (e.g., Jira, Trello) to track progress, manage tasks, and collaborate effectively within a team.
3. Apply agile practices to manage innovation projects, including setting up sprints, conducting daily stand-ups, and refining the product backlog.

Mindset:

1. Cultivate an agile mindset characterized by adaptability, continuous improvement, and a focus on delivering value through iterative development.

Sensors and Actuators for Smart Product

Code	Period	credits	Category
	Innovation I	2	Humanities

This course provides a comprehensive introduction to sensors and actuators, focusing on their application in creating intelligent products. Students will learn about the fundamental principles of sensing and actuation, explore various types of sensors and actuators, and understand how to integrate them into practical projects. The course combines theoretical knowledge with hands-on labs and projects, allowing students to design and implement intelligent products that can interact with their environment.

The course begins by providing an overview of sensors and actuators, where students will define these components, understand their roles in intelligent systems, and discuss their importance in modern engineering applications. This foundational knowledge is further enhanced by examining the fundamental principles underpinning sensors and actuators' operation. Moving forward, the course delves into the various types of sensors and their applications. Students will identify standard environmental, motion, position, and proximity sensors. The exploration then

shifts to actuators, covering both electrical and fluidic types. They implement data acquisition systems using microcontrollers and software, processing sensor data to derive actionable information. In the course's latter stages, students design intelligent products.

Course Objectives:

- Understand the principles and functionalities of different sensors and actuators.
- Design and implement sensor-based systems and actuator-driven mechanisms.
- Analyze the requirements for integrating sensors and actuators into intelligent products.
- Evaluate the performance and reliability of innovative systems in real-world applications.
- Develop an interdisciplinary approach to solving complex engineering problems involving sensors and actuators.

Theoretical Knowledge or Skills:

1. Define the principles and functions of sensors and actuators, including their roles in intelligent systems.
2. Explain the fundamental physical principles governing the operation of different types of sensors and actuators.
3. Analyze the applications of sensors and actuators in various engineering domains, such as environmental monitoring, robotics, and automation.

Applied Knowledge or Know-How:

1. Design signal conditioning circuits to enhance sensor accuracy and implement filtering techniques to remove noise from sensor data.
2. Implement data acquisition systems using microcontrollers and software tools to process sensor data effectively.
3. Develop integrated control systems for actuators, utilizing concepts from basic control theory (e.g., feedback, PID controllers) to create stable and responsive systems.

Mindset:

1. Cultivate an innovative and experimental mindset that embraces iterative design and continuous improvement in the development of intelligent products.

Digital Marketing for Chinese Market

Code	Period	credits	Category
	Innovation I	2	Humanities

The Chinese market presents an immense opportunity, yet it comes with the challenge of being one of the most competitive landscapes globally. Navigating this market requires a deep understanding of its dynamics and an agile approach to adapting to rapid changes. Government policies in China are known for their dynamism, frequently evolving to shape the business environment. Market-impacting events and activities occur almost daily, presenting both challenges and opportunities for businesses. Moreover, technological and product innovation in China is relentless, pushing companies to innovate at a pace that matches or exceeds that of their competitors.

Recognizing the importance of staying abreast of these developments, Data Trends has developed a specialized program designed to collect, identify, and report all relevant data points, subsequently organizing and analyzing them to provide actionable insights. By leveraging this solution, students gain a powerful tool that helps them stay informed about the current data trends within the Chinese market. They can monitor and track the latest innovations that are influencing both local and international markets, thereby positioning themselves to capitalize on emerging opportunities.

For entrepreneurs operating in China, having access to timely and accurate market intelligence is not just beneficial—it's essential. It allows them to make informed decisions to drive their businesses forward, tailor their strategies to meet market demands and respond swiftly to policy changes or new regulations. Furthermore, understanding the nuances of consumer behavior and preferences in such a vast and diverse market can significantly enhance their ability to connect with customers and establish a competitive edge. The insights gained from this program empower entrepreneurs to navigate the complexities of the Chinese market with confidence, fostering sustainable growth and success in their ventures.

Theoretical Knowledge or Skills:

1. Evaluate the impact of government policies on digital marketing strategies within the Chinese market.

2. Analyze the role of cultural factors in shaping consumer behavior and digital engagement in China.
3. Assess the influence of technological trends and innovations on marketing strategies in the Chinese digital landscape.

Applied Knowledge or Know-How:

1. data analytics tools track and interpret market trends, consumer preferences, and competitor activities in real time.
2. Implement social media and e-commerce strategies tailored to the Chinese market, leveraging platforms like WeChat, Douyin, and Taobao.
3. Design targeted digital marketing campaigns that resonate with local audiences, incorporating gamification and personalized content elements.

Mindset:

1. Cultivate an adaptive and proactive mindset that embraces continuous learning and rapid response to changes in the dynamic Chinese market.

Scale up!

Code	Period	credits	Category
	Innovation I	2	Humanities

This course is designed to guide students through the process of scaling up an entrepreneurial product idea into a thriving industrial venture in China. The course integrates theoretical knowledge with practical applications, covering topics from initial concept development to large-scale production and service deployment. Students will learn about sourcing, funding opportunities, incubation programs, and navigating the complex landscape from Minimum Viable Product (MVP) to full-scale industrialization. The course emphasizes the Chinese market's unique challenges and opportunities, including regulatory frameworks, cultural nuances, and technological advancements.

Course Objectives:

- Understand the strategic considerations involved in scaling a product from concept to industrial success.

- Navigate the Chinese business environment, including legal, regulatory, and cultural aspects.
- Identify and leverage funding opportunities and incubation programs available in China.
- Develop a comprehensive plan for moving from an MVP to full-scale production or service deployment.
- Evaluate supply chain and sourcing strategies specific to the Chinese market.
- Apply best practices in managing industrial operations and quality assurance in China.

Key Outcomes:

- Developed a solid understanding of the entrepreneurial ecosystem in China and the strategic considerations involved in scaling a product or service.
- Acquired practical skills in developing an MVP, securing funding, and optimizing supply chain management.
- Gained experience in navigating the regulatory and cultural landscape of China.
- Prepared a final project that demonstrates their ability to plan the industrialization of an entrepreneurial product or service in China.

This course aims to equip students with the theoretical knowledge and practical skills necessary to successfully scale an entrepreneurial idea into a thriving industrial venture in China, preparing them for careers in innovation, entrepreneurship, and international business.

Theoretical Knowledge or Skills:

1. Analyze the Chinese business environment, including legal, regulatory, and cultural aspects that impact entrepreneurship.
2. Evaluate the strategic considerations involved in transitioning from an MVP to full-scale production or service deployment.
3. Assess the role of partnerships and collaborations in enhancing the scalability of entrepreneurial ventures in China.

Applied Knowledge or Know-How:

1. Develop a comprehensive business plan that includes market research, financial projections, and a go-to-market strategy for the Chinese market.
2. Implement sourcing strategies and supply chain optimization techniques that are tailored to the Chinese business landscape.
3. Utilize funding opportunities and incubation programs effectively to secure resources and support for scaling up.

Mindset:

1. Cultivate a resilient and adaptable mindset that embraces the complexities and opportunities of the Chinese market, enabling effective navigation of cultural and regulatory challenges.

Leadership and Presentation

Code	Period	credits	Category
	Innovation I	2	Humanities

This course is designed to equip engineering students with the essential leadership and presentation skills needed to succeed in entrepreneurial endeavors. Focusing on theoretical foundations and practical application, the course will guide students through crafting compelling stories and delivering impactful pitches. Students will learn how to articulate their ideas persuasively, lead teams effectively, and present their projects with confidence and clarity. Particular emphasis will be placed on designing narratives that resonate with audiences and stakeholders, making this course particularly valuable for aspiring entrepreneurs and leaders.

Course Objectives:

- Understand the core principles of effective leadership and communication.
- Craft compelling stories and pitches that engage and persuade stakeholders.
- Develop strong presentation skills, including public speaking, body language, and visual aids.

Key Outcomes:

- Developed a deep understanding of leadership qualities and effective communication strategies.
- Mastered the art of crafting compelling stories and persuasive pitches.
- Enhanced their public speaking and presentation skills.
- Learned how to lead teams and manage projects with a strategic vision.
- Prepared a final project that showcases their ability to design and deliver a persuasive pitch.

Theoretical Knowledge or Skills:

1. Understand the psychological principles behind compelling storytelling and their application in creating persuasive pitches.
2. Identify the critical elements of leadership, including emotional intelligence, decision-making, and strategic thinking.
3. Analyze the impact of non-verbal communication and its role in influencing audience perception during presentations.

Applied Knowledge or Know-How:

1. Craft compelling narratives that resonate with target audiences, incorporating key messaging and emotional appeal.
2. Deliver presentations confidently, using techniques such as voice modulation, pacing, and effective pauses.
3. Develop multimedia presentations that complement verbal communication, ensuring clarity and engagement.

Mindset:

1. Cultivate a growth mindset that embraces continuous learning and feedback, enabling students to refine their leadership and presentation skills over time.