Graduate School of Technology and Innovation Management

□ Programs

▸ Technology and Innovation Management

Technology and Innovation Management is designed to educate future technology and innovation leaders in the corporate and public sectors. The primary tracks include [1] Industrial Innovation which offers courses on process and product innovations and the application of big data and IT in manufacturing industries, [2] Technological Entrepreneurship which provides a balanced set of theory and practice courses on technology commercialization and venture businesses, and [3] Strategic Technology Management which highlights an interdisciplinary problem-solving approach in a wide range of courses on complex technological and innovation decision problems.

▸ New & Renewable Energy Technology and Innovation Management

The need for a sustainable energy supply is becoming more important with declining fossil energy resources, environmental pollution and climate change. The Master's program in New & Renewable Energy Technology and Innovation Management is designed to educate future leaders in the fields of the emerging energy industries. This program focuses on an overview of the energy sector in general, technical training in new and renewable energy technologies, and the integration of technology management and commercialization in the said industries.

□ Credit Requirement

Program	Total Credits	Course Credit	Research credit
Master's	at least 48 credits	at least 48 credits	–
Doctoral	at least 72 credits	at least 39 credits	at least 33 credits

□ Curriculum

▸ Technology and Innovation Management

Course is	Course No.	Classification	Course Title (ENG)	Course Title (KOR)	C-L-E	Remark
Master Required (Core) (Choose 6)	TIM501	Lecture	Management of Technological Innovation	기술혁신경영론	3-3-0	
	TIM502		Managing People at Work	조직행동론	3-3-0	
	TIM503		AI Data Mining	AI 데이터 마이닝	3-3-0	
	TIM504		Marketing	마케팅	3-3-0	
	TIM505		Principles of Finance & Accounting	재무와 회계원론	3-3-0	

	TIM506		Strategy	전략경영	3-3-0	
	TIM507		Management Communications	경영 커뮤니케이션	3-3-0	
	TIM509		Operations Management	운영관리	3-3-0	
	TIM510		Introduction to Business Analytics	비즈니스 분석론	3-3-0	
Master Required **(Practice)** (Choose 2)	TIM691		Industry Internship	산업 인턴십	1-1-0	
	TIM692		Global Study Mission	글로벌 스터디미션	-	
	TIM693		Global Consulting Internship	글로벌 컨설팅 인턴십	1-1-0	
	TIM694		Capstone Project	캡스톤 프로젝트	3-0-6	
	TIM695		Technology, Innovation Management Consulting	기술혁신경영컨설팅	3-3-0	
	TIM696		Seminar on Industry and Emerging Technology Trends	산업 및 첨단기술 세미나	3-3-0	
	TIM697		AI-Digital Transformation Study Mission	AI-디지털 전환 스터디미션	-	
	TIM698		Technology Commercialization Internship	기술사업화인턴십	1-1-0	
Doctoral Required Research Methodology (Choose 5)	TIM710	Lecture	Research Methodology	연구방법론	3-3-0	
	TIM711		Research Methodology for Technology Management	기술경영 연구방법론	3-3-0	
	TIM712		Technology commercialization and Entrepreneurship Seminar	기술사업화 및 창업 이론 세미나	3-3-0	
	TIM713		Industrial Innovation Seminar	산업혁신 이론 세미나	3-3-0	
	TIM714		Technology and Innovation Management Theory Seminar	기술경영 이론 세미나	3-3-0	
	TIM715		Strategy Theory	경영전략이론 세미나	3-3-0	
	TIM716		Advanced Microeconomics	고급미시경제학	3-3-0	
	TIM717		Advanced Econometrics	고급계량경제학	3-3-0	
	TIM718		Corporate Finance Theory	기업재무 이론 세미나	3-3-0	
	TIM891		Independent Study	개별연구	3-3-0	
Doctoral Required	TIM890	Research	Thesis Research	논문연구	Value of Credit	
	TIM610		Advanced Analytics for Process Innovation	비즈니스 프로세스 최적화	3-3-0	산업혁신 트랙

Elective	TIM611	Lecture	Big Data and New Product Development	빅데이터와 신제품 개발	3-3-0	"
	TIM612		Statistical Analysis for Managers	관리자를 위한 통계분석	3-3-0	"
	TIM613		Business Model Innovation: Servitization of Manufacturing	비즈니스 모형 혁신: 제조업의 서비스화	3-3-0	"
	TIM614		Integration of IT, Manufacturing, and Operational Systems	IT, 제조, 운영시스템의 통합	3-3-0	"
	TIM615		Reverse Design and Rapid Prototyping	신속한 시제품 제작 기술	3-3-0	"
	TIM616		AI-Digital Transformation Value Chain Convergence	AI-디지털 전환과 가치사슬 융합	3-3-0	"
	TIM621		Experiential Entrepreneurship & Tech Commercialization	기업가 정신과 기술사업화	3-3-0	
	TIM622		Entrepreneurial Finance	벤처 재무	3-3-0	"
	TIM623		Entrepreneurial Sales & Marketing	벤처 마케팅	3-3-0	"
	TIM624		Growth Strategies for New Ventures	신생벤처기업의 성장전략	3-3-0	"
	TIM625		Operations for Entrepreneurs	벤처기업의 운영전략	3-3-0	"
	TIM626		Pursuing Entrepreneurship within Existing Firms	사내 기업가 정신	3-3-0	"
	TIM631		Leading Innovation and Change	혁신과 변화의 리더십	3-3-0	전략적기술경영트랙
	TIM632		Technology Value and Evaluation	기술가치 평가	3-3-0	"
	TIM633		Law and Intellectual Property Management	법과 지적재산권 관리	3-3-0	"
	TIM634		Disruptive/Radical Innovation and Practice	불연속 혁신과 실제	3-3-0	"
	TIM635		Technology Roadmapping for Strategy & Innovation	전략과 혁신을 위한 기술 로드맵핑	3-3-0	"
	TIM636		Regional Innovation Systems and Technology Policy	지역혁신 시스템과 기술정책	3-3-0	"
	TIM637		Open Innovation and Technology Acquisition Strategy	개방혁신과 기술획득 전략	3-3-0	"
Elective	TIM638		Product Design and Development	제품 설계 및 개발	3-3-0	"

	TIM639		Project Management	프로젝트 관리	3-3-0	“
	TIM640		Business Models for High-Tech Products	하이테크 제품을 위한 비즈니스 모델	3-3-0	“
	TIM641		Manufacturing Systems and Supply Chain Design	제조 시스템과 공급망 설계	3-3-0	“
	TIM642		Knowledge Management and Innovation	지식경영과 혁신	3-3-0	“
	TIM643		Global R&D Management	글로벌 연구개발 관리	3-3-0	“
	TIM644		Negotiation and Deal-Making in Technology Industries	기술 산업에서의 협상과 거래	3-3-0	“
	TIM645		Managerial Economics	관리경제학	3-3-0	“
	TIM646		Technology Licensing Management	기술라이센싱 경영론	3-3-0	“
	TIM647		AI-Digital Transformation Strategy	AI-디지털 전환 전략	3-3-0	“
	TIM648		Digital Marketing	디지털 마케팅	3-3-0	“
	TIM649	Lecture	Global Industry Analysis Project Lab	글로벌 산업분석 프로젝트랩	1-1-0	
	TIM651		Special Topics in TIM Ⅰ	Special Topics in TIM Ⅰ	1-1-0	
	TIM652		Special Topics in TIM Ⅱ	Special Topics in TIM Ⅱ	3-3-0	
	TIM653		Special Topics in TIM Ⅲ	Special Topics in TIM Ⅲ	3-3-0	
	TIM654		Special Topics in TIM Ⅳ	Special Topics in TIM Ⅳ	3-3-0	
	TIM655		Special Topics in TIM Ⅴ	Special Topics in TIM Ⅴ	3-3-0	
	TIM656		Special Topics in TIM Ⅵ	Special Topics in TIM Ⅵ	3-3-0	
	TIM657		Special Topics in TIM Ⅶ	Special Topics in TIM Ⅶ	3-3-0	
	TIM660		Convergence Technology Entrepreneurship Practice	융합기술 창업실습	3-3-0	

▸ New & Renewable Energy Technology and Innovation Management

Course is	Course No.	Classification	Course Title (ENG)	Course Title (KOR)	C-L-E	Remark
Required (Choose 5)	ETM501	Lecture	Energy Systems, Policy, and Market Analysis	에너지 시스템 분석	3-3-0	
	ETM502		Solar Photovoltaic Technology	태양전지 기술	3-3-0	
	ETM503		Wind Energy Technology	풍력 기술	3-3-0	
	ETM504		Hydrogen and Fuel Cell Technology	수소연료전지 기술	3-3-0	
	ETM505		Efficiency in Energy Value Chain	에너지 가치사슬과 효율성	3-3-0	
	ETM506		Business Opportunities for New & Renewable Energy	신재생 에너지 사업화	3-3-0	
	ETM507		Energy Project Financing	에너지 프로젝트 파이낸싱	3-3-0	
	ETM508		Secondary Battery Technology	이차전지 기술	3-3-0	
Elective	TIM501		Management of Technological Innovation	기술혁신경영론	3-3-0	
	TIM502		Managing People at Work	조직행동론	3-3-0	
	TIM503		AI Data Mining	AI 데이터 마이닝	3-3-0	
	TIM504		Marketing	마케팅	3-3-0	
	TIM505		Principles of Finance & Accounting	재무와 회계원론	3-3-0	
	TIM506		Strategy	전략경영	3-3-0	
	TIM507		Management Communications	경영 커뮤니케이션	3-3-0	
	TIM509		Operations Management	운영관리	3-3-0	
	TIM510		Introduction to Business Analytics	비즈니스 분석론	3-3-0	
	TIM610		Advanced Analytics for Process Innovation	비즈니스 프로세스 최적화	3-3-0	산업혁신 트랙
	TIM611		Big Data and New Product Development	빅데이터와 신제품 개발	3-3-0	"
	TIM612		Statistical Analysis for Managers	관리자를 위한 통계분석	3-3-0	"
	TIM613		Business Model Innovation: Servitization of Manufacturing	비즈니스 모형 혁신: 제조업의 서비스화	3-3-0	"

Elective	TIM614	Lecture	Integration of IT, Manufacturing, and Operational Systems	IT, 제조, 운영시스템의 통합	3-3-0	"
	TIM615		Reverse Design and Rapid Prototyping	신속한 시제품 제작 기술	3-3-0	"
	TIM616		AI-Digital Transformation Value Chain Convergence	AI-디지털 전환과 가치사슬 융합	3-3-0	"
	TIM621		Experiential Entrepreneurship & Tech Commercialization	기업가 정신과 기술사업화	3-3-0	
	TIM622		Entrepreneurial Finance	벤처 재무	3-3-0	"
	TIM623		Entrepreneurial Sales & Marketing	벤처 마케팅	3-3-0	"
	TIM624		Growth Strategies for New Ventures	신생벤처기업의 성장전략	3-3-0	"
	TIM625		Operations for Entrepreneurs	벤처기업의 운영전략	3-3-0	"
	TIM626		Pursuing Entrepreneurship within Existing Firms	사내 기업가 정신	3-3-0	"
	TIM631		Leading Innovation and Change	혁신과 변화의 리더십	3-3-0	전략적기술경영트랙
	TIM632		Technology Value and Evaluation	기술가치 평가	3-3-0	"
	TIM633		Law and Intellectual Property Management	법과 지적재산권 관리	3-3-0	"
	TIM634		Disruptive/Radical Innovation and Practice	불연속 혁신과 실제	3-3-0	"
	TIM635		Technology Roadmapping for Strategy & Innovation	전략과 혁신을 위한 기술 로드맵핑	3-3-0	"
	TIM636		Regional Innovation Systems and Technology Policy	지역혁신 시스템과 기술정책	3-3-0	"
	TIM637		Open Innovation and Technology Acquisition Strategy	개방혁신과 기술획득 전략	3-3-0	"
	TIM638		Product Design and Development	제품 설계 및 개발	3-3-0	"
	TIM639		Project Management	프로젝트 관리	3-3-0	"
	TIM640		Business Models for High-Tech Products	하이테크 제품을 위한 비즈니스 모델	3-3-0	"
	TIM641		Manufacturing Systems and Supply Chain Design	제조 시스템과 공급망 설계	3-3-0	"

Elective	TIM642	Lecture	Knowledge Management and Innovation	지식경영과 혁신	3-3-0	“
	TIM643		Global R&D Management	글로벌 연구개발 관리	3-3-0	“
	TIM644		Negotiation and Deal-Making in Technology Industries	기술 산업에서의 협상과 거래	3-3-0	“
	TIM645		Managerial Economics	관리경제학	3-3-0	“
	TIM646		Technology Licensing Management	기술라이센싱 경영론	3-3-0	“
	TIM647		AI-Digital Transformation Strategy	AI-디지털 전환 전략	3-3-0	“
	TIM648		Digital Marketing	디지털 마케팅	3-3-0	“
	TIM649		Global Industry Analysis Project Lab	글로벌 산업분석 프로젝트랩	1-1-0	
	TIM651		Special Topics in TIM Ⅰ	Special Topics in TIM Ⅰ	1-1-0	
	TIM652		Special Topics in TIM Ⅱ	Special Topics in TIM Ⅱ	3-3-0	
	TIM653		Special Topics in TIM Ⅲ	Special Topics in TIM Ⅲ	3-3-0	
	TIM654		Special Topics in TIM Ⅳ	Special Topics in TIM Ⅳ	3-3-0	
	TIM655		Special Topics in TIM Ⅴ	Special Topics in TIM Ⅴ	3-3-0	
	TIM656		Special Topics in TIM Ⅵ	Special Topics in TIM Ⅵ	3-3-0	
	TIM657		Special Topics in TIM Ⅶ	Special Topics in TIM Ⅶ	3-3-0	
	TIM660		Convergence Technology Entrepreneurship Practice	융합기술 창업실습	3-3-0	
	TIM691		Industry Internship	산업 인턴십	1-1-0	
	TIM692		Global Study Mission	글로벌 스터디미션	-	
	TIM693		Global Consulting Internship	글로벌 컨설팅 인턴십	1-1-0	
	TIM694		Capstone Project	캡스톤 프로젝트	3-0-6	
	TIM695		Technology, Innovation Management Consulting	기술혁신경영컨설팅	3-3-0	

	TIM696	Lecture	Seminar on Industry and Emerging Technology Trends	산업 및 첨단기술 세미나	3-3-0	
	TIM697		AI-Digital Transformation Study Mission	AI-디지털 전환 스터디미션	-	
	TIM698		Technology Commercialization Internship	기술사업화인턴십	1-1-0	

□ Description

TIM501 Management of Technological Innovation [기술혁신경영론]

Throughout this course, students learn how firms create and acquire value from innovative products and services. In particular, this course covers topics such as existing companies'management of innovative products and services, technology protection, commercialization processes, plans to acquire value from technological innovation, managing technological changes competition in high tech industries, technology evolution, and IP issues in technology management.

TIM 502 Managing People at Work [조직행동론]

Students will learn theories and concepts to understand people, groups, and organizations in enterprises, as well as practical tools to achieve the goals of individuals, groups, and organizations. Related topics include motivation, human resource management, decision making, organizational culture and change, organizational conflict, individual characteristics, and emotions.

TIM 503 AI Data Mining [AI 데이터 마이닝]

This course provides essential data-mining and AI-programming skills, covering Python basics, data processing, statistical analysis, machine learning, and AI applications. Students from diverse backgrounds will learn core analytic methods and apply them through hands-on projects.

TIM 504 Marketing [마케팅]

This course deals with the subjects needed to design and execute the best marketing effort required to perform a successful strategy in target markets. Students will learn concepts and analytical tools needed for major marketing decisions through lectures, case discussions, case analysis, and presentation.

TIM 505 Principles of Finance & Accounting [재무와 회계원론]

This is a joint course in financial management and accounting. It focuses on the basic concepts and useful methodology to understand the essential knowledge of finance and accounting.

TIM 506 Strategy [전략경영]

This course is designed to address the theoretical and analytical tools relevant to the formulation and implementation of business/corporate strategy. Subjects covered in this course are: external/internal environment analysis, business strategy, corporate strategy, strategic processes, strategy execution, and competition in the high-tech industry. This course will utilize a variety of teaching methods that will help students to understand the practical application of strategic concepts.

TIM 507 Management Communications [경영 커뮤니케이션]

Communication plays a very important role in conceptualizing technological innovation in project teams as well as in developing businesses with stakeholders. Students will enhance their communication skills as they learn relevant communication theories and cases and participate in practice.

TIM 509 Operations Management [운영관리]

This course deals with ways to design and manage core manufacturing and service activities for a firm. Students learn the latest topics such as how to manage sourcing in a global environment and other major topics in management such as the movement of goods among suppliers, factories, and customers, production schedules, productive capacity adjustment, outsourcing/off-shore timing, and network management.

TIM 510 Introduction to Business Analytics [비즈니스 분석론]

In this course, students will study how information is produced and managed in enterprises. Main topics discussed include: the principles of information management; information management technologies; techniques to analyze information needs and use; and the social and ethical context of information management.

TIM 610 Advanced Analytics for Process Innovation [비즈니스 프로세스 최적화]

In this course, students will learn how to visualize business processes inside and outside of the company, how to implement and control people and systems that are related to the performance of the task, and techniques to implement management systems that can efficiently manage and optimize the entire business. Real company cases will be analyzed by using Business Process Management Notation.

TIM 611 Big Data and New Product Development [빅데이터와 신제품 개발]

This course focuses on new product development using consumer and industrial big data. In particular, it deals with real-life domestic and international practices, including utilization of big data in the new product design, obtaining useful information about consumers from big data, and the improvement of existing products using big data.

TIM 612 Statistical Analysis for Managers [관리자를 위한 통계분석]

Analytical decision-making techniques using statistics and optimization models are the main topics of this course. It deals with the approach to statistically analyze business situations. Students will be able to use and analyze data in the fields of marketing, operations management, finance, and more.

TIM 613 Business Model Innovation: Servitization of Manufacturing [비즈니스 모형 혁신: 제조업의 서비스화]

Manufacturing enterprises in a high-cost economic environment should innovate constantly in order to survive. Students learn how manufacturing companies manage innovative services that complement products. Various methods, including service, support, financial services, consulting services, design/development services, and installation services, will be discussed in the course. In addition, topics related to carrying out an innovative service such as the cost-benefit analysis of the service and ways of overcoming organizational change will be covered.

TIM 614 Integration of IT, Manufacturing, and Operational Systems [IT, 제조, 운영시스템의 통합]

This course focuses on basic concepts, applications, and domestic/international cases on internet of things and cyber physical production systems that are the basic idea of smart manufacturing. This course introduces the main structure and integration methods of vertical integration and also the structure, methods, and application of horizontal integration.

TIM 615 Reverse Design and Rapid Prototyping [신속한 시제품 제작 기술]

Students learn the process of rapidly creating a prototype. For this purpose, classes will be conducted in the laboratory, and the techniques of the production of various parts and design, and know-how will be shared. Specifically, 3D printing, laser cutting, water jet cutting, CNC milling, CNC turning, thermoforming, silicone molding, and CNC routers will be used.

TIM 616 AI-Digital Transformation Value Chain Convergence [AI-디지털 전환과 가치사슬 융합]

This course focuses on the investigation of AI digital-transformation from the perspective of value-chain convergence. Students will learn how big data analyses and AI tools are combined and linked to transform R&D, production, and consumption activities into an integrated digital system.

TIM 621 Experiential Entrepreneurship & Tech Commercialization [기업가 정신과 기술사업화]

This course is to understand and experience the fundamentals of entrepreneurship in terms of identifying entrepreneurial opportunities, managing venturing processes, developing business plans and business models, leading start-up teams, and finding markets for technologies. Through this course, students will experience technology commercialization and develop the ability to discover and obtain business value from technologies.

TIM 622 Entrepreneurial Finance [벤처 재무]

This course focuses on the financial problems of start-ups and ventures, and will discuss pros and cons of the various financial options available to these companies. In particular, bootstrapping, crowdfunding, government grants and loans, commercial banks, angel investing, DPOs, venture capital, venture banking, and small IPOs will be discussed.

TIM 623 Entrepreneurial Sales & Marketing [벤처 마케팅]

Students learn about key entrepreneurial marketing concepts and methods and discuss their real world applications in entrepreneurship. It begins with students picking an entrepreneurial venture for which to develop an operational marketing plan.

TIM 624 Growth Strategies for New Ventures [신생벤처기업의 성장전략]

This course focuses on the problems that new venture companies face during their growth stages. Topics will cover company life cycle, growth theories, growth strategy, the role of management, organizational structure, business model innovation, franchise growth strategy, and marketing and finance strategy for growth.

TIM 625 Operations for Entrepreneurs [벤처기업의 운영전략]

This course will analyze specific problems that resource constraint ventures face in building operational strategies and systems.

TIM 626 Pursuing Entrepreneurship within Existing Firms [사내 기업가 정신]

The object of this course is to understand the process of generating a new line of businesses and products in the existing company. Several types of in-house venturing activities as well as venture capital investment, licensing, alliances, joint ventures, and a variety of collaborations will be discussed. Organizational structure and culture that help manage in-house ventures are included as well.

TIM 631 Leading Innovation and Change [혁신과 변화의 리더십]

The objective of this course is to understand the process of adopting and spreading creativity, innovation, and changes within an organization. Students will understand the different types of organizational innovation, search for factors from inside and outside of the organization that influence the success of innovation, and learn about the role of leadership and change management.

TIM 632 Technology Value and Evaluation [기술가치 평가]

This course will focus on the methodology for assessing the value of technical knowledge, and includes the following topics: 1) The concept and options of technology valuation, 2) technology valuation models and methodology, 3) the important elements of technology valuation (market evaluation, intellectual property protection, commercialization strategies, commercialization plans and revenue)

TIM 633 Law and Intellectual Property Management [법과 지적재산권 관리]

This course deals with the comprehensive and practical application of intellectual property and covers topics such as intellectual property laws, industry competition, and the use of new technologies. Students will learn the effective use and strategic management practices of IP, which is used as a means to achieve technical and business objectives.

TIM 634 Disruptive/Radical Innovation and Practice [불연속 혁신과 실제]

Ways to embrace discontinuous innovation like disruptive and radical innovation in corporations are the main focus of this course. Students will identify the various reasons why introducing disruptive and radical innovation in the organization is difficult and navigate technical, organizational, and cultural solutions through an in-depth case analysis.

TIM 635 Technology Road-mapping for Strategy & Innovation [전략과 혁신을 위한 기술 로드맵핑]

Road-mapping techniques are used by many companies as a useful tool for creating social and economic value from technology. Through theory and practice, students will analyze how companies achieve strategic and innovative goals using technology road-mapping.

TIM 636 Regional Innovation Systems and Technology Policy [지역혁신 시스템과 기술정책]

The role of science, technology, and innovation in the economic development of emerging countries and regions is highlighted and analyzed in this course. It deals with the concepts needed to understand the role of technological innovation in economic growth, the institutional innovation transforming existing economies, technological catch-up, take-off strategies, and innovation policies to mobilize these efforts.

TIM 637 Open Innovation and Technology Acquisition Strategy [개방혁신과 기술획득 전략]

This course deals with theoretical and practical issues related to the acquisition of technology, which is one of the key activities for open innovation. Students will learn how to identify and forecast core technology or technology in need using future market requirements, consumer trends, technological developments, and patent trends. They will also learn how to manage specific methods of acquisition such as patent purchases, technical collaboration, licensing, etc.

TIM 638 Product Design and Development [제품 설계 및 개발]

Groups of students with various career backgrounds (management, engineering, industrial design, etc.) will learn modern tools and methods for product design and development. This project will develop a model/prototype of an actual product, including all phases of product development. Classes are conducted through case studies and exercises. Topics include: product planning, confirmation of customer needs, derived concepts, product design, industrial design, concept design, and design for manufacturing.

TIM 639 Project Management [프로젝트 관리]

This course covers the key issues for effective project management. Students learn process and scope management that are essential for project management, schedule management, cost management, personnel management, communications management, risk management, and procurement management.

TIM 640 Business Models for High-Tech Products [하이테크 제품을 위한 비즈니스 모델]

This course helps develop a business model for high-tech products and services. For a successful business model, consistency between important factors, such as the target customer, the proposed value, the range of activities, the value acquisition method, and strategic control, is needed. Students verify the consistency of a wide range of business models through various examples of industries, and learn how to respond in different situations.

TIM 641 Manufacturing Systems and Supply Chain Design [제조 시스템과 공급망 설계]

This course helps decision makers to make better decisions in the design of manufacturing and supply chain systems. Students learn approaches and models that help understanding and structuralizing the trade-offs and essential tasks in designing various systems. In particular, models, methodology, and software that are related to logistic network design, capacity planning, system flexibility, purchase-development issues, and the integration of product development are covered.

TIM 642 Knowledge Management and Innovation [지식경영과 혁신]

In the knowledge-based economy, intellectual property management is indispensable to create and maintain the competitiveness of enterprises. This course covers tools to understand how organizations generate knowledge, share, utilize, integrate and explores knowledge for creating competitive advantage. Several special topics such as knowledge transfer, knowledge reuse, and the development of innovative new products/services are also addressed.

TIM 643 Global R&D Management [글로벌 연구개발 관리]

Students learn the principles to systematically organize and manage R&D in international high-tech companies. The course covers the 3rd-generation research and development management techniques implemented in international conglomerates, the strategic role of R&D, organizational issues in R&D, risk/revenue assessment, open innovation, and

configuring global R&D systems. It also introduces a 4th-generation R&D management, consisting of radical innovation and disruptive innovation.

TIM 644 Negotiation and Deal-Making in Technology Industries [기술 산업에서의 협상과 거래]

This course discuss and practice a set of negotiation and deal making skills that the technology managers and entrepreneurs can use in the process of technology adoption and commercialization. Students learn how to resolve differences in perspectives, time constraints, licensing negotiation, etc., by using various tools such as simulations and mock negotiations.

TIM 645 Managerial Economics [관리경제학]

This course helps create an optimal strategy through economic analysis in a given economic environment. The course deals with the main topics of micro and macroeconomics such as the characteristics of modern enterprise, organization structure design, reward systems, internal labor markets, capital markets, and basic game theory.

TIM 646 Technology Licensing Management [기술라이센싱 경영론]

This course is aimed to provide for students of department of TIM and related majors on licensing, a core biz model of technology commercialization based upon intellectual property rights. Licensing is a kind of contract, permitting a right to use of technology based on intellectual property rights and taking royalty in return thereof, and one technology, intellectual property rights, contracts and negotiation etc, and this course will provide overall knowledge and practical skills.

TIM 647 AI-Digital Transformation Strategy [AI-디지털 전환 전략]

In this course, students review the main concepts of strategic management (industrial organization, resource-based theory, transaction cost theory) and study data-based decision making approaches to learn how to formulate an effective digital transformation strategy.

TIM 648 Digital Marketing [디지털 마케팅]

Digital has revolutionized the interactions between companies and customers using digital and online based technologies. Throughout this course, students learn how to create, communicate, deliver, and exchange market offerings to business partners and customers using online advertising, social media, and other digital tools.

TIM649 Global Industry Analysis Project Lab (글로벌 산업분석 프로젝트랩)

This course develops practical capabilities by learning various analytical methods from economics and strategic management to understand the structure of technology-based industries—such as advanced strategic industries—and to identify the principles of competition. Students apply these methods to actual industrial sectors.

TIM 651, 652, 653, 654, 655, 656, 657 Special Topics in TIM Ⅰ, Ⅱ, Ⅲ, Ⅳ, Ⅴ, Ⅵ, Ⅶ

This course is designed to discuss contemporary topics in Technology & Innovation Management. Actual topics and cases will be selected by the instructor and may vary from term to term.

TIM660 Convergence Technology Entrepreneurship Practice (융합기술 창업실습)

This course is a practice-based class in which students implement cutting-edge technologies into actual products or services and experience the entire startup process. Students receive mentoring

from startup experts throughout idea development, prototype creation, and investment matching.

TIM 691 Industry Internship [산업 인턴십]

Students will experience and gain insight on real technology management problems through internships project in domestic enterprises, small and medium venture companies, or UNIST family companies. Students are encouraged to discuss with mentors and advisors before and after the internship, and then turn in a written report.

TIM 692 Global Study Mission [글로벌 스터디미션]

Students will have problem solving in-class discussions, learn the latest information and trends in the field of technology start-ups and IT & industrial big data for half a semester within UNIST, then find solutions to problems

that are discovered by visiting global leading companies, and build a global network at the same time.

TIM 693 Global Consulting Internship [글로벌 컨설팅 인턴십]

In order to acquire technology management experience from domestic and foreign companies, students will be dispatched or consult on the project of an enterprise.

TIM 694 Capstone Project [캡스톤 프로젝트]

This is a project course to solve the real-life problems of businesses. Students will apply the principles of technology management and plan problem-solving through on-site problem identification, problem analysis, site visiting, and identification of solutions. After the completion of the project, students must turn in a written report.

TIM 695 Technology Innovation Management Consulting [기술혁신경영컨설팅]

In this action learning course, teams of business owners, students, professors, and technology/consulting experts in certain technology areas find out actionable holistic solutions for SME/venture firms that aspire to becoming a global champion in the selected areas. This course helps learn and experience how to assess a SME/venture's managerial as well as innovation capabilities and with the help of industry experts develop an actionable solution for matching its technologies and market demands, and vice versa.

TIM 696 Seminar on Industry and Emerging Technology Trends [산업 및 첨단기술 세미나]

The latest information on industry, emerging trends in high-tech, and foreign companies' new technology development are discussed in this seminar presented by industry leaders and technology experts.

TIM 697 AI-Digital Transformation Study Mission [AI-Digital 전환 스터디미션]

Students learn about the use of artificial intelligence and digital transformation of business processes through a short-term training program with overseas institutions and companies.

TIM698 Technology Commercialization Internship (기술사업화인턴십)

In this course, students participate in technology commercialization projects in various organizations—including family businesses, consortium companies, large corporations, SMEs, and startups—and enhance their technology commercialization capabilities by experiencing real-world problem-solving processes.

TIM 710 Research Methodology [연구방법론]

The primary objective of this course is to learn key issues and approaches of scientific research methodology and provide the theoretical bases to effectively apply qualitative and quantitative research methods in business disciplines. It help students to formulate research questions, do independent literature research, analyze/interpret qualitative and quantitative data, and establish evaluation criteria.

TIM 711 Research Methodology on Technology Management [기술경영 연구방법론]

Students will learn the quantitative and qualitative methodologies needed for research in advanced manufacturing, technology commercialization and entrepreneurship, and strategic management of technology. Advanced statistical analysis, experimental design, and simulation used for the analysis of the IP is included as well.

TIM 712 Technology Commercialization and Entrepreneurship Theory Seminar [기술사업화 및 창업 이론 세미나]

Students will discover various complex phenomena associated with technology commercialization and entrepreneurship and learn theories to explain them. Students will utilize concepts from economics, psychology, organizational behavior, and strategy and have to write a paper on a specific research topic at the end of the semester.

TIM 713 Industrial Innovation Theory Seminar [산업혁신 이론 세미나]

Students will discover technological and behavioral phenomena associated with the issues that occur when applying big data and ICT to industrial sites. They will solve and explain the issues by using various theories. Students are also expected to write a paper on a specific research topic at the end of the semester.

TIM 714 Technology Management Theory Seminar [기술경영 이론 세미나]

This course deals with the applications of recent research and techniques on technology and innovation theories.

TIM 715 Strategic Management Theory Seminar [경영전략 이론 세미나]

This course is to discuss strategy theories. Students read major papers and literature about competitive strategy,

corporate strategy, corporate governance, innovation, entrepreneurship, growth, restructuring, diversification, M&A, and networks and write a term paper that fills the gap in the existing literature.

TIM 716 Advanced Microeconomics [고급 미시경제학]

Students will learn about various theories of microeconomics and write a paper on technology management topics by using microeconomic theory.

TIM 717 Advanced Econometrics [고급 계량경제학]

Students will learn the essential statistical methodologies required for doctoral research and experience various approaches of multivariate analysis such as panel analysis.

TIM 718 Corporate Finance Theory Seminar [기업재무 이론 세미나]

This course will introduce students to corporate finance topics at the doctoral level. While we will consider some theories, the emphasis will be on recent(within the last 10 years) empirical corporate finance papers. We will focus on capital structure, financial policy(in particular, cash holding), IPOs, compensation, and incentives, information disclosure and market efficiency, crash risk and CSR. After successfully completing this class, students should be able to both

understand the main topics within the specific areas of corporate finance and carry out your own original research. In the construction of this class, we assume that students have taken 'FIN 514 Empirical Methods in Finance' and have therefore read the papers and mastered the empirical methodology and skills required in that class.

TIM 890 Research [논문연구]

Students write a dissertation based on a proposal, which has been approved by an advisor.

TIM 891 Independent Study [개별연구]

Students perform an in-depth independent study under the guidance of a supervisor.

ETM 501 Energy System, Policy, and Market Analysis [에너지 시스템 분석]

This course provides a comprehensive overview of energy systems, energy economics theories, and energy market analysis to help perform complete analyses of the connection between energy, policy, economy, and environmental effects. It includes the public energy policy process and investment decisions for private energy firms in domestic and global energy markets.

ETM 502 Solar Photovoltaic Technology [태양전지 기술]

This course aims to provide knowledge on the function of solar cells, solar cell fabrication and characterization, and silicon-based solar cells. Learning areas include: solar energy and function of solar cells; generation, transport and recombination of charge carriers; reflection and absorption of light; theoretical limits on solar cell efficiencies; solar cell modeling; fabrication of silicon for solar cells; fabrication of silicon-based solar cells; solar cell characterization; solar cell design and optimization; other solar cell technologies including high efficiency solar cells, thin film solar cells and electrochemical solar cells, third generation photovoltaic, solar panels, etc.

ETM 503 Wind Energy Technology [풍력 기술]

In this course, students are trained to understand wind energy technologies, wind physics, and assessment of wind potentials. It includes wind resources, physics of wind, aerodynamics, wind measurements, history of wind power, types of wind turbines, nacelle, power train, gear, breaks, electrical systems for wind turbines, control aspects, power and energy yield of wind turbines, planning and operation of wind turbines, and wind project planning.

ETM 504 Hydrogen and Fuel Cell Technology [수소연료전지 기술]

This course provides essential knowledge for the hydrogen economy and fuel cell technology, including the opportunities for using hydrogen, the use of hydrogen in a hydrogen economy, hydrogen production, generation, storage and distribution of hydrogen as a fuel, future potential methods for generating hydrogen based on renewable energy or fuels. This course also addresses thermodynamic and kinetic principles of electrochemical power sources and fuel cells, and current fuel cell technologies available.

ETM 505 Efficiency in Energy Value Chain [에너지 가치사슬과 효율성]

Students in this course learn about energy and environment, energy efficiency principles and practices in residential sector, industrial sector, transport sector, and production and planning sectors, energy efficiency regulations, and life cycle regulations.

ETM 506 Business Opportunities for New & Renewable Energy [신재생 에너지 사업화]

This course focuses on new energy business models and real world application of entrepreneurship to renewable energy and management sectors. Topics include knowledge on business models, business opportunities, challenges, potential solutions, and successful businesses in the renewable energy sectors. Students are also required to participate in business projects where they identify problems to solve with renewable energy products or services, plan for engaging with investors, taking first steps towards launching a new business or corporate

initiative.

ETM 507 Energy Project Financing [에너지 프로젝트 파이낸싱]

This course involves novel application of finance theory and techniques to structure, value and finance large-scale projects, including infrastructure and energy projects, in the private sector, for governments and under PPP schemes. It includes a series of case studies to apply project finance principles and valuation methods to real-life projects. Students will learn best practices and be exposed to the opportunities and challenges of infrastructure and project finance.

ETM 508 Secondary Battery Technology (이차전지 기술)

This course is designed for systematic learning of secondary batteries, covering fundamental principles as well as recent technological trends. It includes battery structure, materials, manufacturing processes, performance evaluation methods, and application technologies, and introduces key emerging technologies for next-generation secondary batteries.