OSTIM TECHNICAL UNIVERSITY
FACULTY OF ECONOMICS AND ADMINISTRATIVE SCIENCES
MANAGEMENT INFORMATION SYSTEMS DEPARTMENT
COURSE SYLLABUS FORM

MIS 425 Technology and Innovation Management							
Course Name	**Course Code**	**Period**	**Hours**	**Application**	**Laboratory**	**Credit**	**ECTS**
Technology and Innovation Management	MIS 425	7	3	0	0	3	4

Language of Instruction	English
Course Status	Elective
Course Level	Bachelor
Learning and Teaching Techniques of the Course	Lecture, Question-Answer, Case Study

Course Objective
This course covers the key concepts, models, and methods that enable participants to effectively manage the development and utilization of technologies. The goal is to develop an awareness of the range, scope, and complexity of the phenomena, issues, and problems related to economics and management of technology and technological innovations. The course will mainly focus on the micro issues but it will extend the discussion to cover macro issues of technology management by studying how industries and firms are transformed by new technologies, how new industries are formed, and what factors affect the technological development and innovation performance. In other words, a systems perspective will be used to develop insights into the conditions under which particular structural arrangements and systems are likely to facilitate technological development. In short, students will develop a better understanding of the complex issues surrounding the managerial tasks with respect to technology.

Learning Outcomes
The students who succeeded in this course will be able;

1. To assess the basic technology management activities and tools,
2. To discuss various problems where particular managerial decisions need to be taken such as technology acquisition and transfer;
3. To use a range of tools used in technology creation, search, assessment, selection, implementation, utilization, and strategy (technology readiness level, patent analysis, technology intelligent, technology roadmaps etc.),
4. To describe the primary tasks and decisions that are required to turn a technological innovation into a sound business opportunity,
5. To recognize technological opportunities and threats and convert into new products and services,
6. To assess how to integrate engineering and business knowledge in running business successfully.

Course Outline
This course provides an introduction and an understanding of the key concepts of technology and innovation management, their relationship with economics and with the organizational environment, and their overall impact on management and organizations. This course will equip students with the conceptual frameworks and analytical tools needed to do research on themes and topics of the Technology and Innovation Management field. This course will analyze both how small and large firms can compete in competitive markets through the management of technology and innovation. There will be a focus on how organizations can structure and manage the process of innovation and how small and large firms can identify market needs and commercialize innovations. The course will primarily use case studies and class discussions to analyze emerging issues in technology strategy, operational decisions and innovation.

Weekly Topics and Related Preparation Studies		
Weeks	Topics	Preparation Studies
1	**Introduction to Technology and Innovation** Basic concepts: Overview and principles, Technology as a competitive advantage	– Why do we need technology in our life? – What is technology and competitive advantage? – Introduction to the course – Course Syllabus and requirements
2	**Patterns of Technological Change** Technology evolution, core competence and industrial dynamics	– Reading Chapter 1
3	**Technology Strategy: SELECTION** Technology evolution, core competence and technology strategy	– Reading Chapter 7
4	**Technology planning – foresight: IDENTIFICATION** Basic concepts: Forecasting, foresight, planning, road mapping.	– Readings: Chapters 4 and 10
5	**Technology Creation – R&D Management: ACQUISITION 1** Technology creation, R&D	– Readings: Chapter 2
6	**Open Innovation: ACQUISITION 2** Core capabilities, core rigidities	– Readings: Chapter 2 – Chiesa, V. and Manzini, R., 1998, "Organizing for Technological Collaborations: a Managerial Perspective", R&D Management, 28 (3): 199-212.

7	**Technology Commercialization: EXPLOITATION 1** Technology marketing and network externalities	– Readings: Chapter 3 – Easingwood, C., Koustelos, A., 2000, "Marketing High Technology: Preparation, Targeting, Positioning, Execution", Business Horizons, May/Jun, Vol. 43 Issue 3.
8	**MIDTERM EXAM**	
9	**Technology transfer – technology diffusion: EXPLOITATION 2** Technology transfer, diffusion, social and organizational context	– Readings: Chapter 3
10	**Cross-functional linkages: PROTECTION and LEARNING** IPR, intellectual assets, learning organization	– Readings: Chapter 5 and 6 – Nonaka, I. And Konno, N., 1998, "The concept of `Ba': Building a foundation for knowledge creation", California Management Review, Spring, 40 (3): 40-55.
11	**Technology Management Tools** Introduction to tools, Patent analysis and Portfolio Management, S-Curve, TRL, Stage-gate process and Value Analysis	– Readings: Chapters 8, 9, 11, 12, 13 – Roadmapping exercise
12	**Technology Management and Design Thinking: Ethics and Sustainability**	– Selection of a case
13	**Managing High-technology, Innovation and Internationalization** CTO, innovation and global networks	– Hargadon, A. and Sutton, R. I., 2000, "Building an Innovation Factory", HBR, May/Jun, 78 (3): 157-167. – Ireland, R. D., Covin, J. G., & Kuratko, D. F. 2009, "Conceptualizing Corporate Entrepreneurship Strategy", Entrepreneurship Theory and Practice, 33: 19-46.
14	**Innovation Management Concept, Process and Strategies for Organization**	– Problem-solving including all topics
15	**Presentation of group projects**	
16	**FINAL EXAM**	
Textbook(s)/References/Materials:		

Textbook: Cetindamar, D., Phaal, R. and Probert, D. (2010). Technology Management Activities and Tools, Palgrave/Macmillan. Trott, P. (2017). Innovation Management and New Product Development, 6th Ed., Pearson. ISBN 978-1-292-13342-3).
Supplementary References: 1. Khalil, T. (2000). Management of Technology: The Key to Competitiveness and Wealth Creation, Boston, MA: McGraw-Hill. 2. Phaal, R., Farrukh, C.J., and Probert, D. R. (2006). "Technology Management Tools: Concept, Development and Application", Technovation, 26(3). 3. Tidd J. and J. Bessant (2014). Strategic Innovation Management, John Wiley & Sons Ltd. (ISBN: 978-1-118-45723-8).
Other Materials: Case studies

Assessment		
Studies	**Number**	**Contribution margin (%)**
Attendance		
Lab		
Class participation and performance		
Field Study		
Course-Specific Internship (if any)		
Quizzes / Studio / Critical		
Homework		
Presentation		
Projects	1	**20**
Report		
Seminar		
Midterm Exam/Midterm Jury	**1**	**30**
General Exam / Final Jury	**1**	**50**
Total		**100**
Success Grade Contribution of Semester Studies		**50**
Success Grade Contribution of End of Term		**50**
Total		**100**
ECTS / Workload Table			

Activities	**Number**	**Duration (Hours)**	**Total Workload**
Course hours (Including the exam week): 16 x total course hours)	16	3	48
Laboratory			
Application			
Course-Specific Internship (if any)			
Field Study			
Study Time Out of Class	16	2	32
Presentation / Seminar Preparation			
Projects	1	8	8
Reports			
Homework			
Quizzes / Studio Review			
Preparation Time for Midterm Exams / Midterm Jury	1	12	12
Preparation Period for the Final Exam / General Jury	1	20	20
Total Workload	**(120/30 = 4)**		**120**

Course' Contribution Level to Learning Outcomes						
Nu	**Learning Outcomes**	**Contribution Level**				
		1	**2**	**3**	**4**	**5**
LO1	To assess the basic technology management activities and tools					X
LO2	To discuss various problems where particular managerial decisions need to be taken such as technology acquisition and transfer					X
LO3	To use a range of tools used in technology creation, search, assessment, selection, implementation, utilization, and strategy (technology readiness level, patent analysis, technology intelligent, technology roadmaps etc.)					X
LO4	To describe the primary tasks and decisions that are required to turn a technological innovation into a sound business opportunity					X
LO5	To recognize technological opportunities and threats and convert into new products and services					X
LO6	To assess how to integrate engineering and business knowledge in running business successfully					X

Nu	Program Competencies	Learning Outcomes						Total Effect (1-5)
		LO1	LO2	LO3	LO4	LO5	LO6	
1	Recognize and distinguish the basic concepts such as data, information, and knowledge in the field of Management Information Systems and know the processes to be followed for data acquisition, storage, updating, and security.	x	x	x		x	x	5
2	Develop and manage databases suitable for collecting, storing, and updating data.			x	x		x	4
3	As a result of his/her ability to think algorithmically, easily find solutions to the problems concerning the basic business functions.		x	x		x	x	5
4	Learn programming logic, have information about current programming languages.							
5	Be able to use up-to-date programming languages							
6	Be able to take part in teamwork or lead a team using knowledge of project management processes.	x	x	x	x	x	x	5
7	Know ethical and legal rules, use professional field knowledge within the scope of ethical and legal rules.		x		x	x	x	4
8	Have knowledge in the fundamental areas of business administration namely management and organization, production, finance, marketing, numerical methods, accounting, etc., and have the knowledge and skills to work in-depth in at least one of them.	x	x		x			3
9	Be able to solve the problems encountered in the field of internet programming by designing web applications.							
10	Develop and manage logistics and supply chain management activities			x	x	x	x	5
11	Adapt his/her theoretical knowledge and the experience he/she will gain through practice at the departments of businesses such as information technologies, R&D, and management to real life.		x		x	x		3
12	Be able to develop strategies that will provide a competitive advantage with his/her advanced knowledge of management strategies and management functions.		x		x	x	x	4
13	Develop a business idea, commercialize the business idea, and design and manage	x	x	x	x	x	x	5

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	his/her own venture using entrepreneurial knowledge.							
14	By using English effectively, they can follow, read, write, speak and communicate universal information in the field of management information systems in a foreign language with professional competence.	X	X		X			2
	Total Effect							45

Policies and Procedures
Web page: https://www.ostimteknik.edu.tr/management-information-systems-english-1241/915
Exams: The exams aim at assessing various dimensions of learning: knowledge of concepts and theories and the ability to apply this knowledge to real-world phenomena, through analyzing the situation, distinguishing problems, and suggesting solutions. The written exams can be of two types, ie. open-ended questions, which can also be in the form of problems or multiple-choice questions.
Assignments: Homework (Assignments) might be applicable. Scientific Research Ethics Rules are very important while preparing assignments. The students should be careful about citing any material used from outside sources and reference them appropriately.
Missed exams: Any student missing an exam needs to bring an official medical report to be able to take a make-up exam. The medical report must be from a state hospital.
Projects: Not applicable.
Attendance: Attendance requirements are announced at the beginning of the term. Students are usually expected to attend at least 70% of the classes during each term.
Objections: If the student observes a material error in his/her grade, he/she has the right to place an objection to the Faculty or the Department. The claim is examined and the student is notified about its outcome.