**BA in Management Program
Fall 2021**

**MGMT 404 – Technology Management**

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**Office Hours:** by appointment

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| --- | --- | --- | --- |
| **Type** | **Time** | **Days** | **Where** |
| Class | 10:40 am - 12:30 pm | M | FASS 1098-online |
| Class | 09:40 pm - 10:30 am | T | FASS 1098-online |

**Course Objective:**

This course is designed to meet the needs of future managers, entrepreneurs, consultants, and investors who must understand the dynamics and develop business strategies in technology-based industries. The course first explores how technological innovation diffuses and affects the competitive dynamics of markets. It then explains key concepts such as types of innovation, research and development, intellectual property, as well as the process of product development. Finally, it examines the mechanisms for leveraging and extracting value from technologies and provides tools those will enable effective management of the development and utilization of technologies and new products.

**Learning Outcomes:**Upon successful completion of the course, the student should be able to:

1. Understand the foundations and implications of the dynamics of innovation, technology evolution, adaption, and diffusion.
2. Define different types of innovation and research & development.
3. Explain key steps and processes in new product development.
4. Identify the technological environment within which a firm does or wants to operate.
5. Describe kinds of intellectual property and know their implications for generating competitive advantage under different dynamics.
6. Use a range of research and decision-making tools for creating, selecting, and implementing new technologies and product projects.
7. Build a technology roadmap for creating and sustaining competitive advantages.
8. Know different types of organizational structures and human resources practices that firms can use to innovate and appropriate value from their technology.

**Course Material:**

Textbook: Shane, Scott A. (2014). Technology Strategy for Managers and Entrepreneurs: Pearson New International Edition. Pearson Education Limited (e-book available)

Articles:

1. Bova, F., Goldfarb, A., Melko, R. (2021). Quantum Computing Is Coming. What Can It Do? Harvard Business Publishing.
2. Heller, M., Salzman, J. (2021). Elon Musk Doesn't Care About Patents. Should You? Harvard Business Publishing.
3. Phaal, R., Farrukh, C., Probert, D. (2001). Technology Roadmapping: Linking Technology Resources to Business Objectives, University of Cambridge. 1-18.
4. Leinwand, P., Mani, M.M. (2021). Digitizing Isn't the Same as Digital Transformation. Harvard Business Publishing.
5. Lessl, M., Trill, H., Birkinshaw, J. (2018). Fostering Employee Innovation at a 150-Year-Old Company. Harvard Business Publishing.

**List of Cases**

|  |  |  |
| --- | --- | --- |
| **Case 1** | **Date:** | **Week 3** |
| Case:Type: Subject:Teamwork: Grading: | DeepMap: Charting the Road Ahead For Autonomous Vehicles. By Greenstein, S., Keller, N. T. (2019), Harvard Business Publishing.PaperTechnology diffusion and adoptionGroup discussionsReflected to individual participation |
| **Case 2** | **Date:** | **Week 10** |
| Case:Type: Subject:Teamwork:Grading: | The Rise and Fall of Nokia (Abridged). By Alcacer, J., Khanna T. (2020), Harvard Business Publishing.PaperTechnology and competitive strategyGroup discussionsReflected to individual participation |
| **Case 3** | **Date:** | **Week 13** |
| Case:Type: Subject:Teamwork: Grading: | How Corporates Co-innovate with Startups: The BMW Startup Garage. By Niessing, J., Capron, L., Furr, N., Balze, P. (2019), Harvard Business Publishing.PaperOrganizing for innovationNoReflected to individual participation |

**Optional Reading Material:**

Week4: Kahn, K. B. (2018). Understanding Innovation, HBP.

Week5: Tushman, M. L., O'Reilly, C. A. (2004) Ambidextrous Organization, HBP.

Week7: Üçler, Ç., Vayvay, Ö., Çobanoğlu, E. (2006). Customer-focused product development and a case study in Turkish refrigerator market, İstanbul Ticaret Üniversitesi Fen Bilimleri Dergisi

Week7: Activision: The Kelly Slater’s Pro Surfer Project. By Maccormack, A., D’Angelo, E. (2005), HBP.

Week8: Kauffman Foundation (2015). How Intellectual Property Can Help or Hinder Innovation.

Week8: Kurt Eichenwald (2014). The Great Smartphone War, Vanity Fair (June, 2014).

Week10: Kim, W.C., Mauborgne, R.A. (2015). Blue Ocean Strategy, Expanded Edition: How to Create Uncontested Market Space and Make the Competition Irrelevant, 1. Creating Blue Oceans. HBP.

Week10: Yaprak, A., Yosun, T., Çetindamar, D. (2018). The influence of firm-specific and country-specific advantages in the internationalization of emerging market firms: Evidence from Turkey, International Business Review. 27(1): 198-207.

Week12: Gine, M., Anton, M. (2018). How Big Data, AI and Blockchain Are Changing Finance: The Fintech Revolution, HBP.

**Course Web:**

The Zoom link for the course will be announced on SuCourse before the first class.

The link for your Harvard Business Publishing Coursepack will be available on SuCourse at the end of the add-drop period. Lecture slides will be uploaded to SuCourse after each class. Detailed information on your team project and any updates on course content and schedule will be announced on SuCourse.

The students should upload their assignments using SuCourse. Sabanci University uses a very powerful web-based tool called Turnitin. Turnitin is the worldwide standard in online plagiarism prevention. It allows instructors to compare student papers against a database composed of millions of articles. Every paper you submit will be scanned by Turnitin, and results will be reflected in your grades.

**Instructional Design:**

The course will be taught with an interactive, experiential, and critical thinking approach using a variety of tools and methods, some of which are listed below:

Guest speakers: We will have speakers from a large established company and a start-up

company to discuss their technology management practices.

Simulation: Strategic Innovation Simulation: Back Bay Battery (v3),

Harvard Business Publishing, by Clayton M. Christensen & Willy Shih

Cases: We will cover 3 cases in class, which you should read before the session (see the schedule). You may be assigned to groups to discuss some questions and share your thought with the class.

In-class exercises: We will have short surveys on Zoom and Kahoot during the classes.

 You will also be given some short exercises to solve in groups.

**Grading**:

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| --- | --- |
| Attendance and participation | : 20% |
| Individual assignment | : 15% |
| Simulation | : 5% (+5% bonus)  |
| Team project | : 30%  |
| Final exam | : 30% |
|  |  |

Peer Evaluation in Teamwork

Students will evaluate the contribution of the team members for their team project. Each student will divide 100 points between the members of her team, including herself. The scores should not be merely functions of time spent by each member, but they should be measures of the "contribution;" their relative contribution to the idea generation, research, analysis, writing, oral presentation, report writing, etc. If the team was highly functional, and each member did what they committed themselves to, then the student can assign the same mark to each member of the team. If, on the other hand, some members of the team did not fulfill their commitments and did not contribute as much as the others, then points can be distributed unevenly. The points submitted by team members will be aggregated by the instructor, without disclosing the individual peer evaluations to the students. In case there is no consensus among the team, for example, if three students divide the marks evenly and the fourth one divides them unevenly, then the instructor will use his/her judgment to assign peer evaluation marks--possibly after meeting with the members of the team. In cases where there are conflicting marks, it is most likely that the instructor will meet with the team members and provide a mark based on an interview. The peer evaluation will have a direct impact on your team project grade. To give a simple example, if the group mark is 25 out of 30, and if your peer evaluation indicates that your contribution was less than what was expected, then your team project mark will be less than 25 out of 30.

**Requirements:**

Attendance and participation (20%): Attendance constitutes 5% of the grade and will be taken each class hour. Attendance of online students will be documented through Zoom’s meeting reports. Failing to open the camera results in being counted absent, except for a real extraordinary situation. Participation constitutes 15% of the grade and it refers to actual contribution to the learning. Inputs to discussions, asking questions, comments, and responses to questions by the instructor, and reactions to your classmates’ arguments are examples to participation. I expect you to at least skim through the readings before class. If we have a case discussion for that week, you need to fully read it beforehand. During the online sessions, students can either unmute themselves to talk or write comments and questions in the Zoom chatbox. We will also use other online tools such as Kahoot to foster a lively discussion, participation to which is essential.

Individual assignment (15%): Students will write an essay on a new technology of their choice (10%) and make a 5 minute presentation to the class (5%). The essay (max 5 pages) will cover a brief explanation of the technology and its existing and potential product applications, as well as answering some questions around the topics we cover. The detailed guideline will be available on SuCourse.

Simulation (5% + 5% bonus): The simulation exercise will provide an experiential learning on some topics covered in class. Before the day of the simulation, read the instruction documents those will be delivered to you and make sure to activate your Harvard Business Publishing account. Grading will be based on completing the simulation requirements including taking notes of strategies and main takeaways. The 5 top runners in the scoreboard will earn bonuses of 5, 4, 3, 2, and 1 points.

Final exam (30%): The final exam will cover all term’s topics. The lecture slides are considered part of the course content, including the content in the slides that may be coming from resources other than your required readings. There will be both multiple choice and essay type questions in the exam, some of which will evaluate your critical thinking on the topics as well as your capability to apply them to business cases. A make-up for the exam will only be possible if you have a valid health report.

Team Project (30%): The team project is intended to have you apply the theories and concepts learnt throughout the term as well as developing your research and analytical thinking skills. The project outputs are a project report and the project presentation. There will be teams of 3-4 students, each team ideally including at least one management and one FENS student. Teams should be formed until Week 3 and companies should be picked by Week 4. There will be in-class facilitation on these weeks to place the students without teams and to fix the cases for the teams.

The project report will cover a case study of a firm including some analysis tools we cover in class and your recommendation for a technology roadmap. To ease access to data, the teams will select their cases from the companies listed in Borsa İstanbul. Teams cannot select same firms or firms from same industries. The list of companies in Borsa İstanbul by sectors and the detailed project guidelines will be available on SuCourse.

The report (22 pnts) should be delivered in a word (docx) file using Times New Roman (1.5 space) and should not exceed 30 pages including the references. The due date for submitting the report is Dec 27, when you will also make 10-minute presentations of your team project. Both the report and presentation should be uploaded to SuCourse before the class. The team presentation constitutes 5 points, whereas individual performances in the team presentation will be graded upon 3 points.

**Academic Honesty:**

Learning is enhanced through cooperation and as such you are encouraged to work in groups, ask for and give help freely in all appropriate settings. At the same time, as a matter of personal integrity, you should only represent your own work as yours. Any work that is submitted to be evaluated in this class should be an original piece of writing, presenting your ideas in your own words. Everything you borrow from books, articles, or web sites (including those in the syllabus) should be properly cited. Although you are encouraged to discuss your ideas with others (including your friends in the class), it is important that you do not share your writing (slides, MS Excel files, reports, etc.) with anyone. Using ideas, text and other intellectual property developed by someone else while claiming it is your original work is *plagiarism*. Copying from others or providing answers or information, written or oral, to others is *cheating*. Unauthorized help from another person or having someone else write one’s paper or assignment is *collusion*. Cheating, plagiarism and collusion are serious offenses that could result in an F grade and disciplinary action. Please pay utmost attention to avoid such accusations.

**Classroom policies and conduct**

Sabancı BA in Management Program values participatory learning. Establishing the necessary social order for a participatory learning environment requires that we all:

* Come prepared to make helpful comments and ask questions that facilitate your own understanding and that of your classmates. This requires that you complete the assigned readings for each session before class starts.
* If you are participating online, make sure you are in a good, quiet working environment and that your cameras and microphones function properly.
* Join the class on time and open your cameras.
* Mute yourself if you are not talking and listen to the person who has the floor.
* Use your technological devices for watching and listening the session, doing in-class exercises and participating to the course, NOT for personal purposes.

**Course Schedule:**

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| **Week 1** | **Dates:** | **27&28 Sep** |
| Topic: | Introduction and course overview |
| **Week 2** | **Dates:** | **4&5 Oct** |
| Topic: | Technology evolution, adoption, diffusion |
| Readings: | Textbook Ch. 1Article1: Quantum Computing Is Coming. What Can It Do? |
| **Week 3** | **Dates:** | **11&12 Oct** |
| Topic: | Technology evolution, adoption, diffusion- continued |
| Readings: | Textbook Ch. 2,3 |
| Case: | DeepMap: Charting the Road Ahead For Autonomous Vehicles. |
| Requirements: | Team formation |
| **Week 4** | **Dates:** | **18&19 Oct** |
| Topic: | Innovation, R&D |
| Readings: | Textbook Ch. 4 |
| Requirements: | Teams’ company selection |
| **Week 5** | **Dates:** | **25&26 Oct** |
| Topic: | Evaluating Innovation Projects |
| Readings: | Textbook Ch. 5 |
| **Week 6** | **Dates:** | **1&2 Nov** |
| Topic: | Understanding market needs |
| Readings: | Textbook Ch. 6 |
| **Week 7** | **Dates:** | **8&9 Nov** |
| Topic: | Product development |
| Readings: | Textbook Ch. 7 |
| **Week 8** | **Dates:** | **15&16 Nov** |
| Topic: | Managing intellectual property |
| Readings: | Textbook Ch. 8,9Article 2: Elon Musk Doesn't Care About Patents. Should You? |
| **Week 9** | **Dates:** | **22 &23 Nov** |
| Topic: | Technical standards |
| Readings: | Textbook Ch. 12 |
| Requirements: | Individual assignment presentations |
| **Week 10** |  **Dates:** | **29&30 Nov** |
| Topic: | Competitive advantage and technology |
| Readings: |  Textbook Ch. 10, 11 |
| Case: | The Rise and Fall of Nokia (Abridged) |
| **Week 11** | **Dates:** | **6&7 Dec** |
| Topic: | Simulation exercise |
| Requirements: | Read the instructions before coming to class |
| **Week 12** | **Dates:** | **13&14 Dec** |
| Topic: | Technology roadmapping |
| Readings: | Article 3: Technology Roadmapping: Linking Technology Resources to Business ObjectivesArticle 4: Digitizing Isn't the Same as Digital Transformation |
| **Week 13** | **Dates:** | **20&21 Dec** |
| Topic: | Organizing and managing HR for technology |
| Readings: | Textbook Ch. 15,16Article 5: Fostering Employee Innovation at a 150-Year-Old Company |
| Case: | How Corporates Co-innovate with Startups: The BMW Startup Garage |
| **Week 14** | **Dates:** | **27&28 Dec** |
| Topic: | Group project presentations |
| Requirements: | Delivering and presenting team projects |