

# TECHNOLOGY AND INNOVATION MANAGEMENT

BLG 442E  
Gökhan İnce, PhD

# Self-Introduction

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## □ Instructor

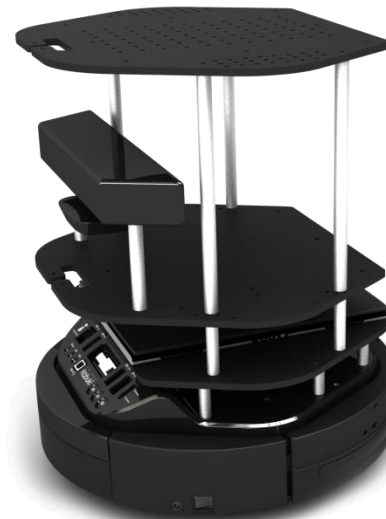
- Dr. Gökhan Ince – gokhan.ince@itu.edu.tr
- Office: EEB 4310
- Web: [www.gokhanince.com](http://www.gokhanince.com)
- Graduated from
  - Istanbul Technical University
  - Technische Universitaet Darmstadt
  - Tokyo Institute of Technology
- Worked for
  - Honda Research Institute Europe – Germany (2 years)
  - Honda Research Institute Japan (4 years)
  - Faculty member at ITU and CEO of TRR Inc. (since 2013)
- Focus of research: Robotics, AI, Signal Proc., HCI

## □ Your turn!

- Demographics
- Major
- Program



# Artificial Intelligence and Robotics Research



# Syllabus

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## □ Books

- ▣ J. Howells, *The Management of Innovation and Technology*, Sage, 2005.
- ▣ J. Fagerberg, D.C. Mowery, and R.R. Nelson (Eds.), *The Oxford handbook of innovation* (Series Oxford Handbooks in Business and Management), Oxford University Press, 2006.
- ▣ M.J. Martin, *Managing Innovation and Entrepreneurship in Technology based Firm*, John Wiley & Sons, 1994.
- ▣ J.E. Ettlie, *Managing Technology Innovation*, John Wiley & Sons, 2000.
- ▣ F. Betz, *Managing Technological Innovation-Competitive Advantage from Change*, John Wiley & Sons, 2003.

## □ Course information/updates on Ninova

- ▣ <http://ninova.itu.edu.tr/Ders/3492/Sinif/11005>

# Syllabus

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## □ Grading

- No mid-term, final exam (40%)
- 3 Projects (10%+15%+15%)
- Project presentation (20%) – 25 mins.

## □ In order to take the final exam:

- Number of absence should be less than or equal to 5 lectures.
- All 3 projects should be submitted. A project is assumed to be submitted if 30 points (out of 100) is given.
- Weighted average of the semester grades should be equal or higher than 30.
- $(\text{Project grades}) * 0.4 + (\text{presentation grades}) * 0.2 \geq 30$

# Submission Calendar

- 1) 14/2
- 2) 21/2
- 3) 28/2 Project 1 submission (tubitak-girişimcilik)
- 4) 7/3 (BONUS: uçarı)
- 5) 14/3
- 6) 21/3
- 7) 28/3 Project 2 submission (ari cekirdek)
- 8) 4/4
- 9) 11/4
- 10) 18/4 Project 3 submission (yfyi)
- 11) 25/4
- 12) 2/5
- 13) 9/5 Presentation submissions, Presentations
- 14) 16/5 Presentations (istebu)

# One of the last year's projects - Technovation



# Course Objectives

- To develop an awareness of the range, scope, and complexity of the issues and problems related to the strategic management of technology and innovation
- To develop an understanding of the “state of the art” methods for the strategic management of technology and innovation
- To introduce a conceptual framework for assessing and auditing the innovative capabilities of a business organization in the field of information technologies
- To expose you to tools and methods used by companies engaged in information technology intensive industries.
- To teach you the basic skills necessary to construct a technology strategy for an IT firm.



# What the course offers

- Entering to various competitions
- Gathering experience for creating a business model
- Guest talks by recently graduated entrepreneurs, SME CEO's, R&D managers from big corporations
- Motivation for entrepreneurship
- Convert your project to a graduation project
  
- Last year: Tubitak 2238 Competition
  - ▣ 8/13 groups proceeded to the 2. round
  - ▣ 3/8 groups proceeded to the 3. round
- İşteBu
  - ▣ 1 group pursued further and won the fourth place.

# Team selection for the projects

- Please send me the name, member names and the leader of your team until 18. Feb by e-mail. If I do not receive any mail until 17:00, I will assign the groups myself.
- Also check the "Groups.xls" file in Ninova after the deadline to fill the missing information about your team.
- Please inspect the terms and conditions of the following competitions/contests thoroughly and contact me personally if you have any concern about submitting your project. Otherwise, I will assume you have read this notice and agreed with the conditions mentioned respectively.
- Good luck with finding great ideas! (I expect each team to collect 15-20 ideas and then narrow them down to 3)
- Drop by my office to discuss your ideas. You have five minutes to convince me and we select the best idea to proceed.

# Technology and Innovation Management

## Structure of the Course

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- I. Introduction: some definitions and basic phenomena; innovation management
- II. Empirical findings: success factors
- III. Basic concepts of innovation management
- IV. Strategic orientation; scenario technique
- V. Idea generation
- VI. Idea evaluation and selection
- VII. Creativity/Innovation workshops
- VIII. Idea management
- IX. Pre-project-stage
- X. Standardised innovation process
- XI. Project management for R&D-projects

# **I. Introduction: Some Definitions and Basic Phenomena; Innovation Management**

# What is a Technological Innovation?

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- Science: creating knowledge (answers the question: why?)
- Technology: Applying knowledge (answers the question: how?)
- Difference between technology and scientific technology
- Science understands nature, scientific technology manipulates nature.
- Technological innovation is the utilization of technical inventions or technological know-how for economic purposes.
- A technological innovation is
  - ▣ a new or considerably improved product/service or
  - ▣ a new or considerably improved production process.
- The process of innovation includes all activities leading to the innovation: Starting with the perception of an unsolved need, the generation of an idea, R&D to solve the problem, through setting up new production capacities and ending with the introduction and widespread diffusion in the market.

# Historically Important Innovations

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Innovation	Function	Date
Tools	Technology	Pre-history
Pottery	Materials	Stone Age
Bronze	Materials	2500s BC
Writing	Literacy	2500s BC
Iron	Materials	1500s BC
Gun	Weapons	1300s AD
Printing	Literacy	1400s
Telescope	Optics	1500s
Microscope	Science	1700s
Steam Engine	Power	1700s
Powered Machinery	Production	1700s
Railroads	Transportation	1830s
Telegraph	Communications	1850s
Chemicals	Materials	1850s
Steam Ships	Transportation	1860s
Cameras	Images	1860s
Telephone	Communications	1880s
Electric Lighting	Illumination	1880s
Electrical Power	Power	1880s
Bicycles	Transportation	1880s
Automobiles	Transportation	1890s
Airplanes	Transportation	1900s
Plastics	Materials	1900s
Movies	Communications	1910s
Electron Tubes	Electronics	1910s
Radio	Communications	1920s
Radar	Sensing	1930s
Space Rockets	Transportation	1930s
Nuclear Fission	Weapons	1930s
Television	Communications	1930s
Computers	Computation	1940s
Transistors	Electronics	1940s
Satellites	Transportation	1950s
Integrated Circuits	Electronics	1950s
Computer Networks	Communications	1970s

Really called *innovation*?

# Case Studies

- Best and worst practice stories that support the theory
- They themselves do not develop or validate a theory
- Ex: Concurrent engineering design of Ford Taurus (1981)
  - ▣ Examined 400 best features of top-class cars
  - ▣ Saved Ford in 1980, sold well, cancelled in 2008
  - ▣ Couldn't it save Ford from bankruptcy in late 00's?
  - ▣ Failure of proper innovation strategy
  - ▣ Bought Volvo and Jaguar
  - ▣ What happened to Ford?