GE 401 – 402 INNOVATIVE PRODUCT DESIGN AND DEVELOPMENT I-II

2016 – 2017 Course Presentation

Dr. M. Alper KUTAY

September 23, 2016
GE 401 Innovative Product Design And Development I – Course Description

Sequence of two courses GE 401: Fall, GE 402: Spring

Fundamentals of design - from the conception of an idea to a marketable end product within the framework of a simulated start-up company. Inception of a start-up company. Business plan preparation; fundamentals of project management; product design stages; incorporation of standards, quality directives, social and environmental factors. Seminars by experts in the field. Concept demonstration of the end-product.

Prerequisites: Each department has its own prerequisites.
GE 401 Innovative Product Design And Development I – Course Description

• This is a 3 credit course (per semester)
• This is a two-term course, ie: GE401 and GE402 must be taken consecutively.
• Multidisciplinary course: 7 different departments from 4 different faculties
• You will study with your friends from different disciplines having different perspectives! A real experience.
GE 401 – 402 Participating Departments

- Department of Communication and Design
- Computer Engineering
- Economics
- Electrical Engineering
- Graphic Design
- Industrial Engineering
- Management
GE401 and GE402 can be taken in the place of:

- In Electrical Engineering; EE491 and EEE495 sequence or EEE493 – EEE494 courses
- In Computer Engineering; CS491 – CS492 sequence,
- In Industrial Engineering; IE477 – IE478 sequence,
- In Management; Dept. Elective and Business Strategy, respectively,
- In Graphic Design; Elective courses,
- In Communication and Design; Elective courses,
- In Economics; Econ Elective and non-Econ elective, respectively.
GE 401 – 402 Prerequisites

- EE Students:
  - EEE212-Microprocessors
  - EEE313-Electronic Circuit Design
  - EEE321-Signals and Systems
- CS Students:
  - CS202-Fundamental Structures of Computer Science II
  - CS319-Object-Oriented Software Engineering
- IE Students:
  - IE271-Operations Analysis
  - IE375-Production Planning
GE 401 – 402 Prerequisites

• MAN Students:
  • MAN321-Corporate Finance

• ECON Students:
  • ECON301-Econometrics I

• GRA Students:
  • GRA301-Graphic Design III

• COMD Students:
  • COMD305-Digital Video Production I
Lecturers:

- CS: H. Altay GÜVENİR  guvenir@cs.bilkent.edu.tr
- EE: M. Alper KUTAY  kutay@ee.bilkent.edu.tr
- IE: Yiğit KARPAT  ykarpat@bilkent.edu.tr
- COMD: Julide AKSİYOTE  aksiyote@bilkent.edu.tr

Course web page: http://ge402.bilkent.edu.tr
TA’s:

• CS: Nooshin S. FARAMARZI
  noushin.salek@bilkent.edu.tr

• EE: Abdul ALİ
  N. Koray ERTAN
  ertan@ee.bilkent.edu.tr
  Mücahit GÜMÜŞ
  mgumus@ee.bilkent.edu.tr
Course Structure

• THE PROJECT
• SEMINARS
• WORKSHOPS
• STOCK MARKET
• COACHING:
  • Each Discipline coached by the same discipline
  • Weekly meetings with lecturers for EE, CS, IE
  • EE and CS students meet regularly at EE102 on Fridays at 15.40
  • EE and CS students work on their projects at EE102 during free hours
  • Graded in the discipline for about 50%
Team Structure

- Maximum of 6 Students
- Minimum of 4 students
- Maximum of 2 Students from a Single Department
- Total of 2 students from MAN and ECON
- Total of one student from GRA and COMD
- Only One Student From Industrial Engineering Department if there is MAN student in the team
- Maximum 8 teams
- Diversity is desired to promote multidisciplinary structure
Team (Company) Organization (suggested)

- CEO (Chief Executive Officer)
- Finance
- Engineering
- Production
- Quality
- Marketing
Team Organization (suggested)

- **Technical Design**: Electrical, Computer and Industrial eng.
- **Business plan**: Management, Economy and Industrial Eng.
- **Project management**: Industrial Eng.
- **Quality**: Industrial Eng.
- **Communications, and web page design**: Graphic design, Comm. And Design, Computer and Industrial Eng.
- **Marketing**: Management, Economy, Industrial Eng.
The Project

- Students propose a project
- Lecturers act as advisors to the students
- Sell the idea to course lecturers and get venture capital
- Work on different functions of running a company while realising the project
- Complete and demonstrate the product at the end of the year (This is a must)
The Project

• Students propose an innovative project

• Innovative means-examples:
  • A new idea,
  • A new process,
  • An idea that makes production easier or makes life easier for mankind
  • To sum up; something that makes life easier for the mankind-i.e., something that makes money or saves money.
The Project

- Students are encouraged to develop ideas and projects that are not commonplace and that is expected to produce wealth if realized either in Turkey or in the World.
- Projects must contain enough technical content, which will fulfill the senior project requirements of EE and CS departments.
- Projects must be conducted in such a manner that will fulfill the senior project requirements of IE department.
- Projects must be conducted in such a manner that is acceptable to ECON, MAN, GRA and COMD departments for their students to participate.
Seminars

• Classroom is at EE-01, 2 lecture hours.
• About 15-17 seminars per year on subjects related to start-up company running
• Seminars will be technical and non-technical. Product design, development, production and marketing involve both technical and non-technical aspects.
• All team member should attend to these seminars. They will give you a very important perspective
• Distinguished lecturers from both the business and academia
Workshops

- Workshops about current subjects and/or about the projects of teams.
- The second hour will be used for workshops, business plan preparation, etc. at some instances.
Lab Session for Engineers

- EE and CS students get together at EE-102, weekly during 15.40 – 17.30 on Friday
- They work on their projects and designs with the help of course advisors and assistants.
- A table and a locker for their equipment will be provided and assigned to each team EE and CS students at EE-102.
- EE and CS students work at EE-102 at any time.
Stock Market

• The stocks of the companies established by the students will be traded at the virtual stock market during the second semester

• Some of the lecturers of the Bilkent University and professionals outside will act as the traders of the stock market

• The success of your company at the stock market will be part of grading
Industrial Methodology

- Literature Survey and Competition Report
- Product Requirements
- Product Specifications
- System Design and Preliminary Design
- Product and Subassembly Specification
- Detailed Documents (Technical Drawings)
- Development Plan
- Configuration Management
- Quality (Quality Function Deployment)
- Quality Certification (Based on industrial Methodology)
### Plan of First and Second Week

<table>
<thead>
<tr>
<th>Date</th>
<th>Event</th>
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<tbody>
<tr>
<td>23.09.2016 Friday</td>
<td>Course Presentation at EE – 001</td>
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<tr>
<td>(12:30 - 13:30)</td>
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<tr>
<td>23.09.2016 Friday</td>
<td>Team forming Meeting at EE – 001</td>
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<td>(17:30 - 18:30)</td>
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<td>25.09.2016 Sunday</td>
<td>Team lists and project proposals are submitted (by e-mail to</td>
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<td>(18:00)</td>
<td><a href="mailto:kutay@ee.bilkent.edu.tr">kutay@ee.bilkent.edu.tr</a>)</td>
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<td>26.09.2016 Monday</td>
<td>Proposals evaluated and commented (Winning teams announced by</td>
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<td>(19:00)</td>
<td>replying to e-mails) and <strong>winning teams register to the course</strong></td>
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<tr>
<td>28.09.2016 Wednesday</td>
<td>2nd round of team proposals are submitted by e-mail to</td>
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<td>(12:00)</td>
<td><a href="mailto:kutay@ee.bilkent.edu.tr">kutay@ee.bilkent.edu.tr</a>)</td>
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<td>28.09.2016</td>
<td>Course Introduction at EE – 001</td>
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<td>Wednesday</td>
<td>(13:40 - 15:30)</td>
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<td>26.09.2016</td>
<td>2nd round of team proposals are evaluated (Winning teams announced by</td>
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<td>Wednesday</td>
<td>replying to e-mails) and winning teams can register to the course</td>
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<td>(20:00)</td>
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<tr>
<td>29.09.2016</td>
<td>The last day of add/drop. Members of unsuccessful teams register to</td>
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<tr>
<td>Thursday</td>
<td>other courses</td>
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<td>30.09.2016</td>
<td>Introduction of lab space, assignment of team tables and cabinets etc.</td>
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<tr>
<td>Friday</td>
<td>EE-102.</td>
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<td>(15:40 – 17:30)</td>
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Project Proposal Form

NAME OF THE PRODUCT
(Team number)

Date:
Team and team composition:

<table>
<thead>
<tr>
<th>Student ID</th>
<th>Name</th>
<th>Dept</th>
<th>e-mail</th>
<th>Cell phone no</th>
<th>signature</th>
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Short explanation of the project (at most one page):
Explain here what the principle function of the project is and who will use the project (Target customer). Also explain the basic method of realizing the project.

Required resources and approximate cost:

Equipment:

Materials:

You can download project proposal form from webpage.

Basic roles of the students in the teams:
(Such as HW designer (IE), SW designer (CS), Project manager (IE), Financial manager(MAN, ECON), graphic design and communications (COMD, GRA))
We will be using Moodle throughout the semester.
Where To Look For Projects

• Internet (Just for inspiration)

• FP7 and H2020
  http://ec.europa.eu/programmes/horizon2020/

• Eurostars – Eureka
  https://www.eurostars-eureka.eu

• NSF SBIR
  http://www.nsf.gov/eng/iip/sbir/
Innovative Products and Entrepreneurship

• Innovation and entrepreneurship: two terms commonly used together and cited as the key for healthy economic growth
• New technology is very important for military and economic power
• Economic power: use new technology to produce marketable products: innovation and entrepreneurship
• Example: facebook, whatsapp, apple, microsoft
Innovative Products and Entrepreneurship

• Very important item in R&D policy of both developed and developing countries
• Start-ups and small companies: more innovative
• Many national and international funds available:
  Teknogirişim, TUBITAK 1512, Kalkınma Ajansları, H2020 etc.
Innovative Product Design And Development, GE401-GE402

• This course gives you the chance to work in a start-up company environment
• Innovate/run/grow/change continuously
• Interdisciplinary collaboration,
• Project and team (especially multi-disciplinary) management,
• Simultaneous emphasis on the originality and the marketibility of an idea,
Innovative Product Design And Development, GE401-GE402

- Involvement of a large number of students from different faculties,
- Real-life experience at the university level.
Benefits to Students

• Hands-on project running experience
• Broadened student vision of the industrial and working environment
• Early work experience-company orientation starting at senior level
• Up-to-date information from distinguished lecturers on practical matters of running a company
• An important reference on C.V.
• Successful completion of the course will definitely increase your chance of finding funds
Companies

- 2001-2002: 4 companies
- 2002-2003: 2 companies
- 2003-2004: 7 companies
- 2004-2005: 10 companies
- 2005-2006: 12 companies
- 2006-2007: 8 companies
- 2007-2008: 8 companies
- 2008-2009: 11 companies
- 2009-2010: 14 companies
- 2010-2011: 9 companies
- 2011-2012: 9 companies
- 2012-2013: 8 companies
- 2013-2014: 9 Companies
- 2014-2015: 8 Companies
- 2015-2016: 7 Companies
Experiences of Student of Previous Years: Koray Ertan, TA of the course