上海交通大学
SHANGHAI JIAO TONG UNIVERSITY

Case Study -
Vg 100 Introduction to Engineering

“工程导论”课程概况

上海交通大学教务处
高捷

背景介绍

- 合作历程：

  为建设世界一流大学，我校选择了与自身学科结构相似的美国公立大学密西根大学作为合作对象，进行深度合作。

  第一阶段——2000年8月至2005年6月，以机械工程学科为试点，在教学、科研、人员交流等方面展开合作。

  第二阶段——2005年6月起，成立“上海交通大学－密西根大学联合学院”（后更名为“上海交通大学密西根学院”），在更广的领域、更深的层次合作办学。

- 上海交大密西根学院的办学特色：
  - 与密西根大学相同的教师聘用与考核标准；
  - 与上海交大同时、同代码招生，生源水平相同；
  - 课程体系与密西根大学相近，全英语的教学与管理环境；
  - 将综合能力培养有机融入课程体系和课程教学实践；
  - 经常性的诚信教育和严格的诚信规则。

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背景介绍

Industry Perspective

- What emerging engineers need to do?
  - Teams/Teamwork 94% 团队合作
  - Communication 89% 沟通交流
  - Design for Manufacture 88% 设计的可实现性
  - Professional Ethics 85% 职业道德
  - Creative Thinking 85% 创造性思维
  - Design for Performance 85% 性能设计
  - Design for Reliability 82% 可靠性设计
  - Design for Safety 80% 安全性设计
  - Concurrent Engineering 74% 并行工作
  - Application of Statistics 73% 统计学的应用

About Vg 100（工程导论）

- What is Vg 100?

1. An engineering student’s first taste of what it is to really be a practicing engineer
2. Designed to simulate a real world engineering environment where teamwork, communication, and creativity are the keys to success

- Students are introduced to:

1. **Technical problem solving and the creative engineering design process**
2. **Preparation of written technical reports and oral presentations to communicate your great ideas to a broad audience**
3. **Teamwork and team management**
4. **The influence of the engineer on society**
5. **The ethics of engineering practice**
6. **Environmental sustainability**
7. **Decision-making skills**

Overall Design of the Course

- Engineering theme: Everyday Mechatronics
- Technical communication seamlessly integrated with engineering activities
- Lectures on engineering as well as technical communication topics
- Two hands-on design projects:
  - Robotic Race Car
  - Everyday Mechatronic System
- Emphasis on **teamwork, communication, creative thinking, and real-world problem solving**



Role of the Engineering Instructor

- Responsible for the design and delivery of the course
- Lecture on the fundamentals and applications of mechatronics:
  - Introduction to mechatronics
  - Actuators, sensors, and electronic circuits
  - Control systems and computer programming
  - Robotics
  - Rapid prototyping
  - Laser printer/Photocopier/Computer mice
  - CD/DVD/Blue-ray Disc
  - Electric vehicle
  - Green manufacturing

Role of the Tech. Comm. Instructor

- Assist the Engineering Instructor on the delivery of the course
- Lecture on technical communication topics:
  - Memorandum and task letters
  - Importance of technical communication
  - Introduction to technical communication
  - Ethics in engineering
  - Oral reports and presentations
  - Technical writing style
- Grade student writing assignments, project reports, and oral presentations from technical communication perspective and provide feedbacks

Role of the Teaching Assistants

- TAs play a very important role in this course as assistants to the course instructors
- They help the Engineering Instructor design and set up labs
- They lecture on some of the engineering details related to the projects
- They help the course instructors grade homework assignments, exams, project reports, and oral presentation
- They interact with students and provide help to them on projects

Course Details

- Individual Assignments
  - Homework #1: Task Letter
  - Homework #2: Professional Email
  - Homework #3: Ethics Paper
- Team Assignments
  - Project #1: Robotic Race Car (Project Deliverables: Prototype device , Project summary report)
  - Project #2: Everyday Mechatronic System (Project Deliverables: Oral project proposal , Progress report , Prototype demonstration , Oral presentation , Final report)
- Student-Instructor Contact Hours
  - 1.5 hours of lecture per week on engineering topics
  - 1.5 hours of lecture per week on technical communication topics
  - 2 hours of lab per week
  - 2~3 hours of office hours per week for each instructor and TA

Course Details

Course Grading:

- Individual Work50%
  - Homework (3) 15%
  - Midterm Exam 15%
  - Final Exam 20%
- Team Work50%
  - Project #1 Device Performance 10%
  - Project #1 Summary Report 10%
  - Project #2 Progress Report 5%
  - Project #2 Prototype Demonstration 5%
  - Project #2 Final Report 10%
  - Project #2 Oral Presentation 10%

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Summary

- Vg 100 emphasizes on teamwork, communication, creative thinking, and real-world problem solving through open-ended hands-on projects
- It provides freshmen students with their fist experience as engineers, which stimulates their interest in engineering and motivates their future study
- Students demonstrate tremendous passion and creativity in the course projects, which is truly amazing

欢迎大家批评帮助

Thank You Very Much !