MISTI China

MIT International Science and Technology Initiatives

International Education at MIT:
Hands-on Learning in a Global Laboratory
Programs

Individual Internships
Companies and Research Institutes

Team Internships:
MIT-China Educational Technology Initiatives (CETI)
MIT-China & MIT-OpenCourseWare
MIT-China & MIT-iCampus
MIT-China & MIT-D-lab
MIT-China & Chinese High Schools
Intern Requirements

- MIT student/recent alum in good standing
- GPA: B Average or better
- Support of MIT Faculty Advisor
- Two years of Chinese language study (or equivalent) for individual internships; one semester of Chinese for team internships
- Course on modern China
- Spring Training: 17.549 "Issues in Contemporary China" 3 credits
Host Institutions
Individual and Team Internships
(a few examples)

• Dalian University of Technology
• Fudan University
• Kunming University of Science & Technology
• National Taiwan University
• Peking University
• Qinghai University
• Shandong University
• Tsinghua University
• Xi’an Jiaotong University
• Yunnan University
• Zhejiang University

• Asian Development Bank
• Beijing Olympic Committee
• UNDP
• UNIDO
• US Embassy, Commercial Section
• World Bank
MIT-China Educational Technology Initiatives (CETI)

With President Clinton in Beijing, 1998

With Ambassador Charlene Barshefsky in Cambridge MA, 2002

With President Clinton in Beijing, 1998
OCW Site Highlights

- Syllabus
- Course Calendar
- Lecture Notes
- Assignments
- Exams
- Problem/Solution Sets
- Labs and Projects
- Simulations
- Tools and Tutorials
- Video Lectures
2004 Pilot OCW Project: Qinghai University

Qinghai Province
Tibetan-Qinghai Plateau
Xining, Qinghai Province
MIT-China & OpenCourseWare

Qinghai University
2004 Qinghai Team
Qinghai University
Impromptu Xining television interview: 2005
Qinghai Project Overview

• Schedule
  – Three Lectures, two recitations, one lab per week
  – Four English classes per week

• 100 Students
  – 40 second-year ‘General Studies’ students
  – Three groups of 20 third-year students majoring in Bio, EECS, Environmental
Syllabus (1)

- Biology
  - OCW Materials from 7.012, 7.03, 7.02 (Intro to Biology, Genetics, Biology Laboratory)

- OCW Usage
  - Review of concepts, prep for lecture, notes, problem sets, exam questions
Syllabus (2)

- EECS
  - Based on 6.001 (Structure & Interpretation of Computer Programs)

- OCW Usage
  - Notes, labs, exams
• Environmental Engineering
  – Materials from 1.061 and 1.031 (Env. Transport Processes & Geotechnical Eng.)

• OCW Usage
  – Prep for classes: notes, example problems, quizzes, supplemental materials
## Qinghai Teaching Schedule

<table>
<thead>
<tr>
<th>Time</th>
<th>Monday</th>
<th>Tuesday</th>
<th>Wednesday</th>
<th>Thursday</th>
<th>Friday</th>
</tr>
</thead>
<tbody>
<tr>
<td>9 am</td>
<td>CS Lecture</td>
<td>Culture</td>
<td>Environmental</td>
<td>Culture</td>
<td>Biology</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Presentation</td>
<td>Lecture</td>
<td>Presentation</td>
<td>Lecture</td>
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<tr>
<td>10 am</td>
<td>Environmental</td>
<td>Recitation #1</td>
<td>Biology</td>
<td>Recitation #1</td>
<td>CS Lecture</td>
</tr>
<tr>
<td></td>
<td>Lecture</td>
<td></td>
<td>Lecture</td>
<td></td>
<td></td>
</tr>
<tr>
<td>11 am</td>
<td>Biology</td>
<td>Recitation #2</td>
<td>CS Lecture</td>
<td>Recitation #2</td>
<td>Environmental</td>
</tr>
<tr>
<td></td>
<td>Lecture</td>
<td></td>
<td></td>
<td></td>
<td>Lecture</td>
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<tr>
<td>12 pm</td>
<td>Lunch</td>
<td>Lunch</td>
<td>Lunch</td>
<td>Lunch</td>
<td>Lunch</td>
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<tr>
<td>1 pm</td>
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</tr>
<tr>
<td>2 pm</td>
<td>Lab #1</td>
<td>Recitation #3</td>
<td>Lab #2</td>
<td>Recitation #3</td>
<td>Lab #3</td>
</tr>
<tr>
<td>3 pm</td>
<td></td>
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<tr>
<td>4 pm</td>
<td>English</td>
<td>English</td>
<td>English</td>
<td>English</td>
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<tr>
<td>5 pm</td>
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</table>
Tsinghua and Xi’an Jiaotong Universities (Summer 2005)

• 8 weeks
  – 6 at Tsinghua University, Beijing
  – 2 at Xi’an Jiaotong University

• Main Objectives
  – Establish exchanges between Chinese universities and MIT
  – Demonstration of MIT EECS class structure and OCW/iCampus technologies
  – Obtain feedback from faculty and students on technologies
Tsinghua University, Beijing

- 6 weeks during June and July 2005
- Collaboration with Tsinghua’s CS dept
- 16 students, entering freshmen
  - 12 from China’s NOI top 20
  - 4 from China’s IMO team
- Team members
  - Chang She ('05, Course 6-1)
  - Shiling Seow ('06, Course 6-2)
  - Vanessa Hsu ('05, Course 6-1)
- Other MIT participants
  - Stephanie Claussen ('05, Course 6-1)
  - Scot Frank ('08, Course 6)
  - Angus Hucknall (M.S.'05, Course 3)
Program Structure

<table>
<thead>
<tr>
<th>Time</th>
<th>MON</th>
<th>TUES</th>
<th>WED</th>
<th>THURS</th>
<th>FRI</th>
</tr>
</thead>
<tbody>
<tr>
<td>9-10</td>
<td>6.034 Lecture</td>
<td></td>
<td>6.034 Lecture</td>
<td></td>
<td></td>
</tr>
<tr>
<td>10-11</td>
<td>6.001 Lecture</td>
<td>6.001 Recitation</td>
<td>6.001 Lecture</td>
<td>6.001 Recitation</td>
<td>OpenCourseWare Seminar</td>
</tr>
<tr>
<td>11-12</td>
<td>Culture/Communication</td>
<td>6.034 Recitation</td>
<td>Culture/Communication</td>
<td>6.034 Recitation</td>
<td>iCampus/xTutor Seminar</td>
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<tr>
<td>12-1:30</td>
<td>LUNCH</td>
<td>LUNCH</td>
<td>LUNCH</td>
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<tr>
<td>1:30-3</td>
<td>LAB</td>
<td>LAB</td>
<td>LAB</td>
<td>LAB</td>
<td>LAB</td>
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</tbody>
</table>

Lectures

Lab Time

Recitations
Program Curriculum

• Structure and interpretation of computer programs (6.001)
  – Covered up to 80% of course material
  – Used MIT Scheme and XTutor for homework
  – Assigned projects 0 and 1, Avatar project optional

• Artificial Intelligence (6.034)
  – Mostly lectures and recitation, no assigned homework
  – Lectures based on Prof. Winston’s lectures
  – Individual presentations by student on AI topics
Supplementary Material

• Culture and Communication component
  – American idioms/English pronunciation
  – MIT Culture and Hacks,
  – Giving technical talks

• Seminars on other OCW & iCampus projects
Xi’an Jiaotong University

- Shorter program
  - August 1-11
- Approximately 30 students
  - Rising sophomores in EE, CS, and Communication
- Condensed version of curriculum as a demo class
- iLabs EE OCW introduction
Curriculum @ Xian JiaoDa

Weekly Schedule

- **Mornings: 9-12 AM**
  - 9 AM: 6.001 Lecture (Structure and Interpretation of Computer Programs)
  - 10 AM: Culture and Communication modules
  - 11 AM: 6.012 Lecture/Lab (Microelectronic Devices)

- **Afternoons: 2-5 PM**
  - 2 PM: 6.034 Lecture (Artificial Intelligence)
  - 3 PM: Tutorials/Computer Lab
Dalian University of Technology
(Summer 2005)
MIT-China & iLabs

- **iLabs** - remote (online) access to MIT Laboratories
iLabs at MIT

Dynamic signal analyzer (EECS, deployed 2004)

Microelectronics device characterization (EECS, deployed 1998)

Polymer crystallization (Chem. E., deployed 2003)

Heat exchanger (Chem. E., deployed 2001)

Shake table (Civil Eng., deployed 2004)
iLabs & OCW: Microelectronics

• Service Broker
Introduction to Java

• Modified version of SP.772 Spring 05 OCW
• 5 hrs per week to 40 students for 4 weeks
• Lectures interweaved with labs
• Topics included control structures, arrays, methods, classes, and list structures
• Introduced GUI and Swing in last lab
Dalian OCW Java Lecture
Introduction to Microelectronics

• Modified version of 6.004 OCW Courseware from Spring 2005 course
• 3.5 hrs per week to 80 students for 3 weeks
• CMOS diagrams
• circuit design with FETs and gates using Jsim
• Full adder, 4-bit adder
• MOSFET & diode experiments using WebLab
Dalian OCW Microelectronics Lecture
Preliminary Conclusions

• Impact on Chinese Universities
• Impact on MIT
• Challenges & Obstacles
• Early Lessons (for similar collaborations in other parts of the world)
2006 Program Expansion

- Dalian University of Technology
- Kunming University of Science & Technology
- Qinghai Normal University
- Qinghai University
- Shandong University
- Tsinghua University
- Xi’an Jiaotong University
- Yunnan University
- Zhejiang University
MISTI China

Hands-on Learning in a Global Laboratory

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