

# Proposals of Project-Based Learning with Global Partners

February 2014

Osaka Institute of Technology  
International Center

Director Hisaaki Shinkai  
(Prof. Dept. Information Sci. & Tech.)  
[shinkai@is.oit.ac.jp](mailto:shinkai@is.oit.ac.jp)



## New Campus in 2017 in front of Osaka main station



朝日新聞 DIGITAL

トピックス 『東京新聞紙縮小版に賛成 安藤美穂氏賛成 朝日新聞紙縮小版 特定種別保護法案の浮城』

号外：貨物船「第18栄丸」から見つかった乗組員5人はいずれも心停止状態 (1)

ニュース > 記事

2013/09/27日 10時56分

梅田ビルに新キャンパス 大阪工大、小学校跡地に

【成金街也】大阪工業大などを経営する学校法人常期学園（大阪市地区）は27日、大阪市から購入した北区 茶屋町の新梅田小学校跡地に、「梅田キャンパス」として地上22階地下2階のビルを建設すると発表した。

2016年秋に完成し、大工大の工学デザイン分野が移転し、摂南大や近畿国大も進学交流拠点にするなど、数千人規模の学生が利用する予定。梅田では最大規模の大学キャンパスとなる。

場所は 阪急梅田駅の東側にある繁華街の一等地で、約4万5千平方メートル。梅田東小が1989年に廃校になった後、生涯学習施設として使われていたが、同学園が11年に市から9億円で購入した。低層階には多目的ホールや飲食店も入り、一般の利用も想定している。

会見した大阪工業大の井上正樹学長は「社会との接点を大切にしながら大学を発展させたい」と述べた。

大学の都心回帰が進み、梅田周辺では宝

OSAKA INSTITUTE OF TECHNOLOGY

Location & Access

About Osaka Institute of Technology

Graduate School and Faculty of Engineering

Graduate School and Faculty of Information Science and Technology

Graduate School and Faculty of Intellectual Property

since 1922  
8000 students

<http://www.oit.ac.jp/english/index.html>

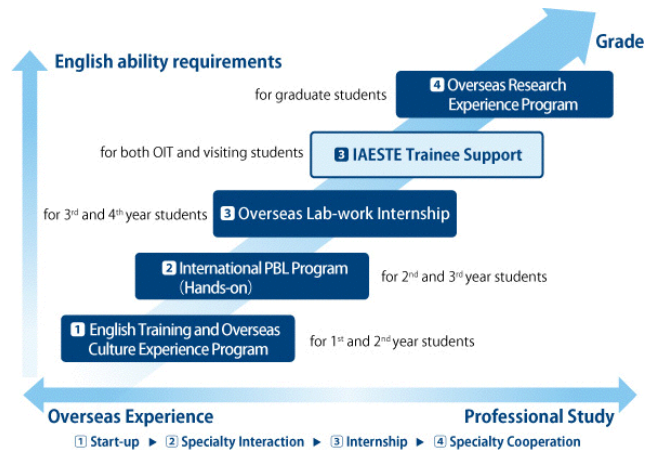
## Overseas Partner Institutions <http://www.oit.ac.jp/english/about/international.html>

Countries or Areas	Institution
Australia	Queensland University of Technology
Austria	Vienna University of Technology
China	Tsinghua University
	Torjji University
	City University of Hong Kong
Germany	Technische Universität München
	Universität der Bundeswehr München
	Bergische Universität Wuppertal
Malaysia	Universiti Teknologi Malaysia
Poland	Wroclaw University of Technology
Saudi Arabia	King Abdulaziz University
	Al-Imam Muhammad Ibn Saud Islam
South Korea	Daejeon University
Spain	University of Salamanca
Taiwan, R.O.C.	National Formosa University
	National Yunlin University of Science and Technology
	National Kaohsiung First University of Science and Technology
	National Taipei University of Technology
	National Taiwan University of Science and Technology
	Shihhsin University
Thailand	Sirindhorn International Institute of Technology Thammasat University
	Thai-Nichi Institute of Technology
U.S.A	Rice University

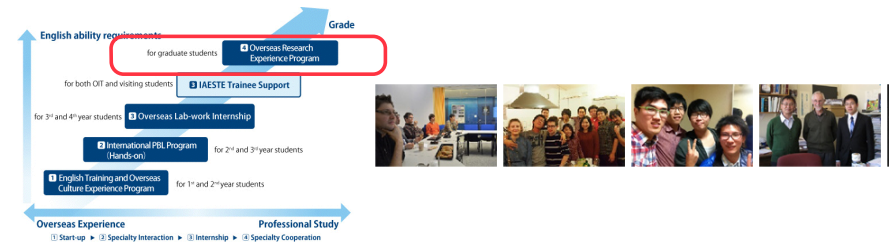
台湾	交流大学等	英文略記	協定締結年月	主な交流内容
	国立虎尾科技大学	NATIONAL FORMOSA UNIVERSITY	2007年1月	留学生の受入(短期)
	国立雲林科技大学	NATIONAL YUNLIN UNIVERSITY OF SCIENCE AND TECHNOLOGY	2007年2月	留学生の受入(短期)
	国立高雄第一科技大学	NATIONAL KAHSIUNG FIRST UNIVERSITY OF SCIENCE AND TECHNOLOGY	2009年6月	留学生の受入(短期)
	世新大学	SHIHHSIN UNIVERSITY	2009年3月	留学生の受入(短期)
	国立台北科技大学	NATIONAL TAIPEI UNIVERSITY OF TECHNOLOGY	2012年3月	教育と研究における協力と学術交流協定
	国立台湾科技大学	NATIONAL TAWAN UNIVERSITY OF SCIENCE AND TECHNOLOGY	2013年10月	教育と研究における協力と学術交流協定

# OIT Study Abroad Programs



<http://www.oit.ac.jp/english/internationalCenter.html>

# Overseas Research Experience Program (for OIT graduate students)



OIT → 30 students  
ave. 60 days  
in 2014-2015



★ 17 students in 2013-2014

# Overseas Lab-Work Internship (for both OIT and partner-institution 3rd and 4th year students)



OIT

10 students  
15 days

partner univ.

**【大阪工業大学受入】**

- 期間：2013年6月24日～8月12日（48日間）
- 研修先：台北科技大学の機械・電気系学生9名
- 研修先：先端学際国際センター
- 目的：コンピュータ工学の発展、知識の習得
- 研修方法：1～2名の研修生をロボット工学科の各研究室に受入、2ヶ月間で共同研究課題を設定し、7日毎の報告の下、レポートを提出する。

**【大阪工業大学学生の研修テーマ（抜粋）】**

- Development of Intelligent Mobile Robots
- Brain Computer Interface
- Control of a drawing robot using a parallel link mechanism

9 students  
48 days

**【台北科技大学受入】**

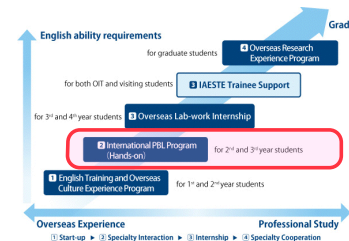
- 期間：2013年8月15日～9月1日（15日間）
- 研修先：大阪工業大学工学部の学生10名
- 研修先：台北科技大学受入
- 目的：ロボット工学の発展、知識の習得、コミュニケーション能力の向上
- 研修方法：1～2名の台北科技大学の各研究室に受入、2週間共同研究課題を設定し、研修学生の能力の下、レポートを提出する。

**【大阪工業大学学生の研修テーマ（抜粋）】**

- Development of Prosthetic Hand Actuated by Shape Memory Alloys
- Basic IC Design
- Control of a Robot Arm Using a Haptic Device

with NTUT, Taiwan 2013

# International Project-Based Learning (iPBL) Program



OIT

10 students



partner univ.

+10 students  
(5 teams/20 students)

+10 students  
(5 teams/20 students)

10 students

<http://www.oit.ac.jp/english/pbl.html>

## International Project-Based Learning (iPBL) Program

### Program Summary

OIT provides training courses with hands-on activities called "PBL" for 2nd and 3rd year students. The iPBL program was developed with our overseas partnership universities.

In each iPBL program, students from both universities are grouped together and are instructed to communicate in English. Each team completes the same project, such as hardware/software development or system design, which can promote students' practical engineering skills.

The summer 2013 iPBL program allowed OIT students collaborate with students from National Taipei University of Technology (NTUT). OIT believes that the interaction between groups of international students allowed students from both universities to experience diversity and professional environment that more reflects our globalized world.

<http://www.oit.ac.jp/english/pbl.html>

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## Goals of PBL

Through project-based learning, our goal is to help students develop practical engineering skills by themselves. These skills include;

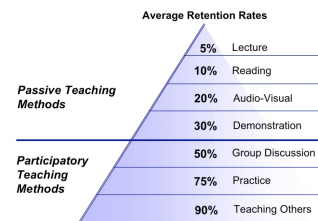
**idea generation skills,**  
**communication and presentation skills,**  
**organization and time management skills,**  
**research and inquiry skills,**  
**self-assessment and reflection skills,**  
**group participation and leadership skills.**

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## Why PBL?

- There is a big difference in learning retention rate between passive and active learning
- PBL helps students self-develop skills for living in a knowledge-based, highly technological society
- PBL is wonderfully effective in achieving a deep understanding and technology utilization
- OIT has two-stage PBL, i.e.
  - Introductory PBL for first graders
  - Advanced PBL at third grade

The Learning Pyramid\*



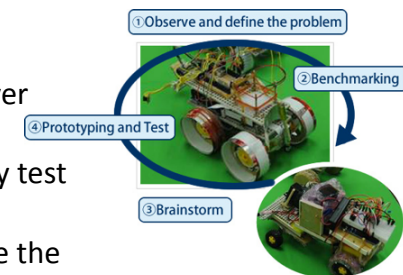
\*Adapted from National Training Laboratories, Bethel, Maine

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## PBL process

Through the project, students must learn these steps.

- Understand the needs and define the problems
- Survey existing technologies
- Intensive brainstorm to discover various ideas
- Iteratively prototype to quickly test the ideas
- Based on the test result, refine the ideas
- Make final presentation and write the project report



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# iPBL 2014 (plan fixed)

Thailand

Thammasat Univ. + OIT Information Science

(1) Computational Photography (2) Real-World Game Programming



Haze-degraded image

Haze-free image using the soft matte



★ However, it is possible to change the kinds of objects and the means of acquiring.

Thailand

Thai-Nichi Inst. Tech. + OIT Information Science

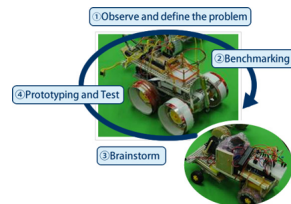
(2) Real-World Game Programming

# iPBL 2014 (proposals)

Taiwan

National Taipei Univ. of Tech.  
+ OIT Electronics & Electronics Communication

Intelligent Vehicle



National Taiwan Univ. of Sci. and Tech.  
+ OIT ?

(A) Bridge Models ?

(B) Design using wind simulator ?

(C) Wind Turbine ?

# iPBL 2014 [proposal summary]

Name	OIT Dept of...	# students	preferred period
(A) Bridge Models	Civil Engineering and Urban Design	max 10	Early August
(B) Design using wind simulator	Architecture	8-15	Late August
(C) Wind Turbine	Mechanical Engineering	10	Early August

## PBL with NTUT 2013

We had the iPBL program "Smooth Vehicle Challenge" at National Taipei University of Technology (NTUT) with OIT students.

1. Host: National Taipei University of Technology, Taiwan

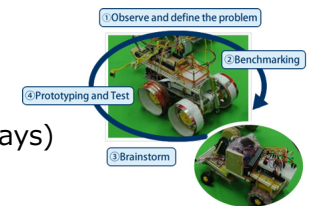
2. When: August 6th – 12th, 2013 (7 days)

3. Participants: 2nd and 3rd year 30 undergrad students, separated into 5 groups

OIT - 15 students (Majoring in Electronics, Information and Communication Engineering)

NTUT - 15 students (Majoring in Machine Engineering)

<http://www.oit.ac.jp/english/pbl.html>





## Fabrication of small bridge models under given conditions

Dept. of Civil Engineering and Urban Design, OIT

井上教授, 大山准教授

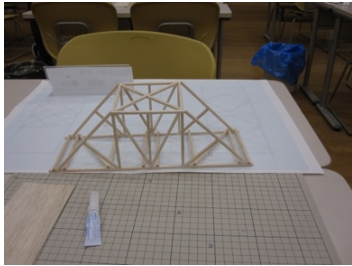
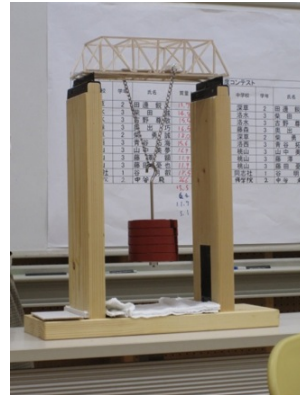


image photo



## Project Schedule

Day 1	AM	
	PM	Planning (Prepare 2 models in each group)
Day 2	AM	Model 2 small bridges as a case study.
	PM	Model 2 small bridges as a case study. Select 1 model.
Day 3	AM	Presentation (1 model in each group)
	PM	Model 1 bridge model for contest.
Day 4	AM	Model 1 bridge model for contest.
	PM	Model 1 bridge model for contest.
Day 5	AM	Presentation (Contest)
	PM	

We appreciate if tour is planned.

## Conditions

**Safety** : can tolerate for one minute over the load of 30 kg and bend 50 mm or less

**Beautifulness of the model**

## Procedures

1. Each group (2 or 3, max 5 students) draws two plans for their imaging bridges.  
Through discussion and pre-test using small-size models, they decide the final plan.  
Each group makes their presentation on the design concept of their final plan.
2. Each group begins to fabricate a bridge model using given materials under restricted condition.  
After fabrication, load carrying capacity of each bridge model and also its design beautifulness are verified.

## Requirements for students

**10+10 2nd or 3rd-year undergrad students**  
who has knowledge or interest in the structure of bridges

## Preparation

**Big room with drafters & desks.**  
Items for modeling (balsawood, bonds, cutters, ...), weight, ...

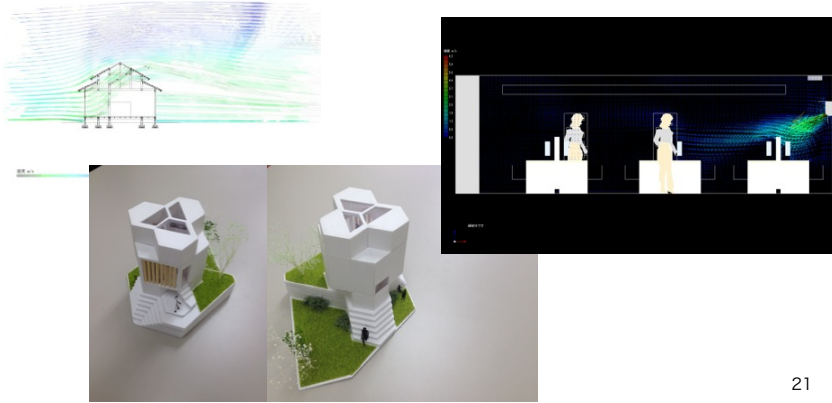
## Planning Period

**Early August**

## Architectural design method using environmental simulation

Dept. of Architecture, OIT

前田講師, 河野講師, 岡山教授



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## Project Schedule

Day 1	AM	
	PM	Orientation and Training for the CFD simulation.
Day 2	AM	Study and CFD simulation, debate.
	PM	Study and CFD simulation, debate.
Day 3	AM	Making model and proposal
	PM	Making model and proposal
Day 4	AM	Making model and proposal
	PM	Making model and proposal
Day 5	AM	Presentation (Contest)
	PM	

We appreciate if tour is planned.

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## Theme

Design workshop in determining the shape of the building with the CFD simulation, in order to try and find more ecological approach and method to the architecture and urban .

Design of the apartment complex concentrating the flow of winds under given window size.

## Scheme

4 or 5 groups (one group = 2 Japanese + 2 Taiwanese)  
Each group plans using CFD simulator.

Each group submits their final plan with its model.  
Contest with awards on their plan, design, and/or presentation.

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## Requirements for students

10+10 students (2nd or 3rd-year undergrad students)  
who can operate Windows PC, (Photoshop or Illustrator).

## Preparation

One PC (Windows, Core i3 or higher, 4GB memory) for a group.  
CFD simulator (FlowDesigner) licenses are available for one month.

Experiences of using 3D modeling softwares (e.g. Rhinoceros or Google SकेchUp will help.

## Planning Period

Late August

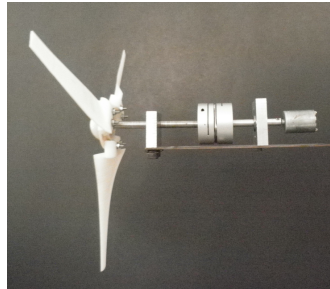
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## Development of small wind turbine with wind lens

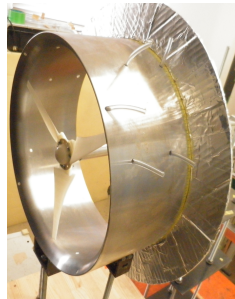
Dept. of Mechanical Engineering, OIT

上辻准教授, 山本准教授

Assist. Prof. Uetsuji, Assist. Prof. Yamamoto, Assist.Prof. Yoshida, Lecturer Iyota



wind turbine



wind lens

## Schedule

Day 1	AM	
	PM	Orientation
Day 2	AM	Concept making
	PM	Design review
Day 3	AM	Modeling wind turbine
	PM	Modeling wind turbine
Day 4	AM	Modeling wind turbine and wind lens
	PM	Trial operations and improvement
Day 5	AM	Preparation for presentation
	PM	Presentation (Contest)

## Theme

Comparison of wind power generators, created as a wind turbine with wind lens.

Students try to model the shape and the size of the turbine blade and the wind lens within the constraint of outer diameter, and competitions will be held using the large fan.

## Scheme

Total 15–20 students from both universities make 5–7 teams composed by the equal number of students.

The results will be judged by the generated power, design and/or the robustness.

The design review meeting and the final presentation are scheduled daily.

## Requirements

10+10 students (2nd or 3rd-year undergrad students) who can communicate in English.

The computers or LAN environment is necessary to gather information on site concerning wind lens.

## Preparation

The wind turbine blade and the wind lens will be manufactured by the corrugated board or plastic plate.

The special motor and gear set for the wind turbine will be supplied by OIT.

## Planning Period

Early August.