



お茶の水女子大学  
Ochanomizu University

**Program of Leading Graduate Schools**

Complex Type - Interdisciplinary Theme – Adopted in the 2013 Academic Year



**Fostering long-term creativity and innovation with  
science and technology disciplines based on Ochanomizu spirit  
“Migakazuba” in the next generation of global leaders**

Fostering soft leaders in the fields of science and technology based on team study  
and strengthening basics of physics, mathematics and computer science

**Program Kickoff Symposium on March 3<sup>rd</sup>, 2014**

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## Prospectus of Kickoff Symposium

A graduate educational program proposed by Ochanomizu University, Fostering Long-Term Creativity and Innovation with Science and Technology Disciplines Based on Ochanomizu Spirit “Migakazuba”, was adopted as one of leading graduate school programs (Complex Type: Interdisciplinary Theme) by the Ministry of Education, Culture, Sports, Science and Technology in Japan in the academic year 2013.

It is certain that innovation is a key for Japan’s sustainable development. Meanwhile, Japan’s prosperity is said to be at stake because of shrinking workforce due to the falling birth rate and the aging population, which urgently requires women to participate actively in society as potential labor force. In such circumstances, our program makes close cooperation with the business world and aims at fostering woman innovators in the fields of science and technology, especially in the areas where the representation of women is very low. Innovators should accommodate rapidly changing social needs and keep long-term creativity demanded by society. We consider that this is only possible if they have high flexibility and confidence on their academic bases of physics, mathematics, and information technology etc.

Expecting those woman innovators to work as global leaders, the program provides skill training for three qualities which are required for global leaders – 1) language and communication skills, 2) initiative, proactive behavior, cooperative personality, and flexibility etc. 3) cross-cultural understanding. In addition to those skills, it also provides IT knowledge that is essential for gathering and disseminating information.

The program is implemented as a 5-year minor course in the graduate school which unifies a master’s course and a doctoral course. Each student participating in the program develops the knowledge and skills required for future global leaders in the minor course while she deepens her expertise in her own major course. Highlighted feature of our program is “Project Based Team Study (PBTS)” which is introduced to develop talented women who have excellent communication skills with global perspective and will be able to find and solve problems with global awareness. PBTS is a team study in which students from different fields of specialty or different cultural backgrounds make a cross-functional team and work together on a theme selected by themselves while competing with each other in our “Migakazuba” spirit.

Ochanomizu University has many achievements in fostering woman leaders as a pioneer of women’s education in Japan. Based on that experience, the program is fostering future soft leaders who are capable of managing diverse cultures flexibly and working effectively in the society.

In order to announce our program widely to the society and to share the concept of the program with many people we would like to hold a Kickoff Symposium, in which keynote lectures by the executive people in industry, academia and government, an introduction of our program, a panel discussion of “how to foster innovators who can lead diverse society” and presentations of PBTS themes by the students selected to the program will be provided.

Program Director: Tetsuya Kawamura,  
Program Coordinator: Hazuki Furukawa,  
Deputy Program Coordinator: Akio Sugamoto

## Program of Leading Graduate Schools

“Program of Leading Graduate Schools” is a project to lead talented students to global leaders in wide areas of industry, academia, and government with wide perspectives and creativity. The program has to gather the first-class teachers and students domestically and internationally, and develops in the cooperation between industry, academia and government. This is a promotion project to support universities to reconstruct educational systems of their graduate schools as to be the highest educational institutions. In this project, doctorate programs which have the quality recognized globally will be built and developed in the course unifying master’s and doctoral beyond the specialized academic fields.

## Fostering talented women in science and technology with our “Migakazuba” spirit

**Fostering long-term creativity and innovation with science and technology disciplines based on Ochanomizu spirit “Migakazuba” in the next generation of global leaders**

**“Migakazuba” spirit : polish uncut stones and revolutionize society**

Ochanomizu University has been fostering woman leaders based on “Migakazuba” spirit expressed in its school song. Especially in the field of science, we have produced many leading woman researchers and advanced professionals who succeeded in industry, academia and government.

“Migakazuba” is the spirit to reform oneself and others, and consequently the whole world by polishing gem (oneself). This is just the spirit of creating innovations.

Our program aims at fostering women, disciplined for physics, mathematics and computer science, who will be able to maintain long-term innovation. The women to be fostered will have flexibility to accommodate rapidly changing social needs, and will work as global leaders in the fields of science and technology where the representation of women is very low. We will develop the program by acting as a hub for the cooperation of industry, academia and government.



Without polishing  
A gem or a mirror,  
What good would it be?  
The path of learning  
Should be  
Like this

## Program Features

1. Fostering human resources that can be immediate assets in companies
2. Strict performance assessments and study support systems
3. Taking a role of a hub for strong cooperation between industry, academia and government

### 3 Program Features

#### 1. Fostering human resources that can be immediate assets in companies

In the program, we will open a new minor course of science and technology for global leaders, in which we foster future global leaders who can start their career as an immediate asset in the society. This minor course includes following subjects – 1) Reinforcement Program on Basic Science, 2) Strengthening Global Capability, 3) Strengthening Teamwork Capability (PBTS Practice).

The students in the program take the lectures in the minor course (e.g. Essential Physics for Global Leaders I & II for strengthening Basics, Essential Culture and Arts for strengthening Global Capability) while they deepen their expertise in their major courses. They also attend the PBTS (Project Based Team Study) program for practical training of cross-cultural response, independent problem solving, and program management and so on.

#### ① Reinforcement Program on Basic Science

##### Coursework to be a sustainable innovator

Essential [Mathematics](#) for Global Leaders I • II  
Essential [Physics](#) for Global Leaders I • II  
Essential [Chemistry](#) for Global Leaders I • II  
Essential [Bioinformatics](#) for Global Leaders I • II  
Essential [Computer Science](#) for Global Leaders I • II  
Essential [Engineering and Technology](#) for Global Leaders I • II

To be a sustainable innovator, basic knowledge of sciences that make it possible to find and solve new problems over multiple fields is required on top of deep specialty deserving of doctorate. The program strengthens such basic abilities by putting some emphasis on physics, mathematics and computer science.

#### ② Strengthening Global Capability

##### Coursework for global leaders in the next generation

###### English Education:

“English Academic Presentation”, “Science Reading”, “Science Writing”,  
“English Academic Writing”, “Presentation Method Study”

###### Career Education:

“Special course on Career Development (Basic, Advanced, Roll Models, Training)”

###### Leader Education:

“Special course on Global Female Leader (Basic, Advanced, Roll Models, Training)”,  
“Special course on Project Management”

###### IT Engineering-Related Courses:

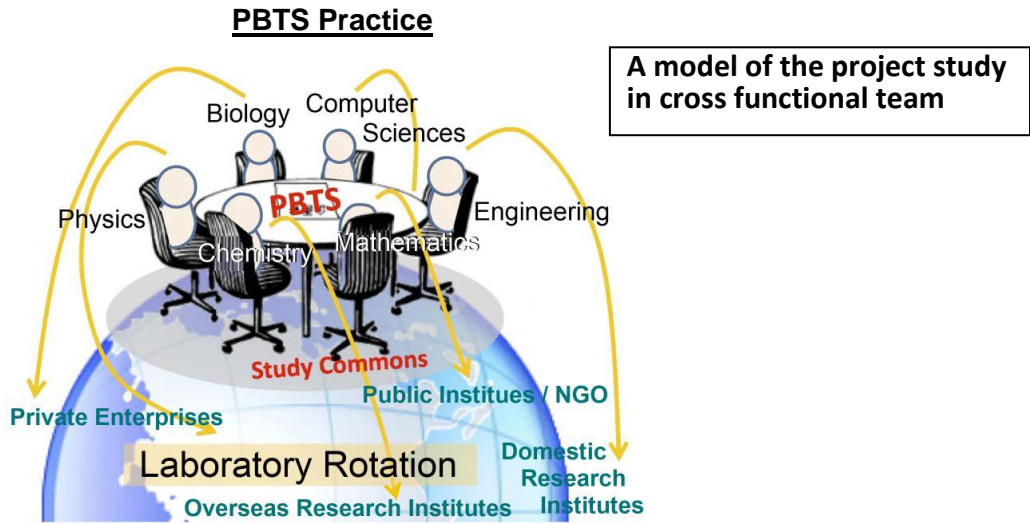
“IT Utilization I, II”

###### Liberal Arts in Graduate Courses:

“Essential Philosophy”, “Essential Ethics”, “Essential History”, “Essential Culture and Arts”

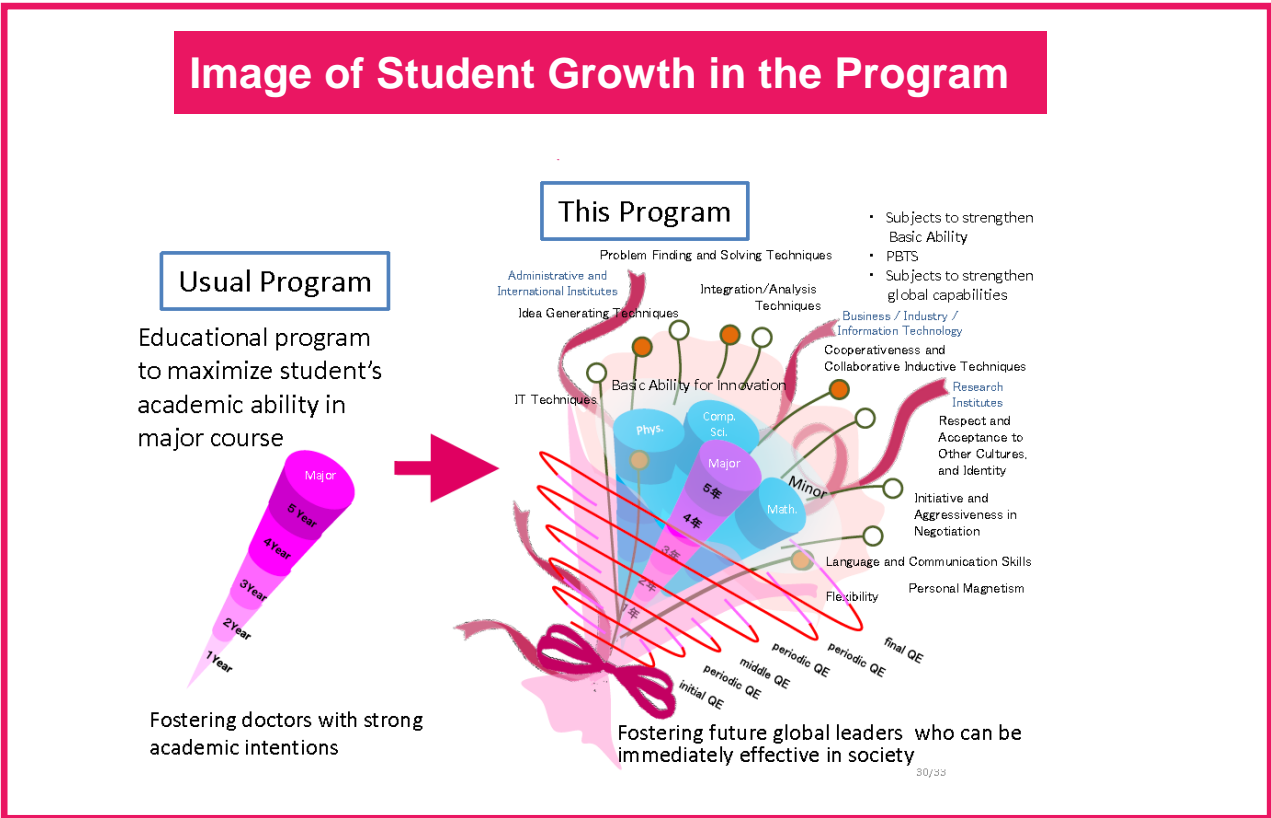
To become a global leader, high level skills and abilities are required for language, communication and project management. It also requires humanity for cross cultural understanding. The program provides subjects to strengthen global capability.

### ③ Strengthening Teamwork Capability



Highlighted feature of our program is “PBTS (Project Based Team Study)” in which passive learning style in PBL (Project Based Learning) is developed into independent, competitive and goal-oriented team study.

This is an education system to develop students’ speciality and humanities most effectively through team study in which students with different backgrounds work together through friendly rivalry on the theme selected by themselves. There are non-Japanese mentors joined as a supporter. Team members will work together and compete with other teams, and write a sub-thesis for doctorate in English jointly.



## 2. Strict performance assessments and study support systems

The program introduces functional strict GPA and four types of Qualifying Examinations (QE) based on rubrics for strict and accurate assessments of the performance. To implement the assessments, we develop three types of learning system – 1) Assessment of achievement in graduate school, 2) Study Portfolio, 3) Utilization of Study Commons. After the program end, we will provide the systems to other schools at free of charge. The program also introduces Teamwork Portfolio system as the assessment base for PBTS.

### Training of Project Management

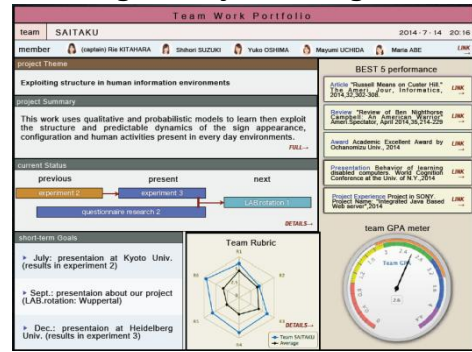
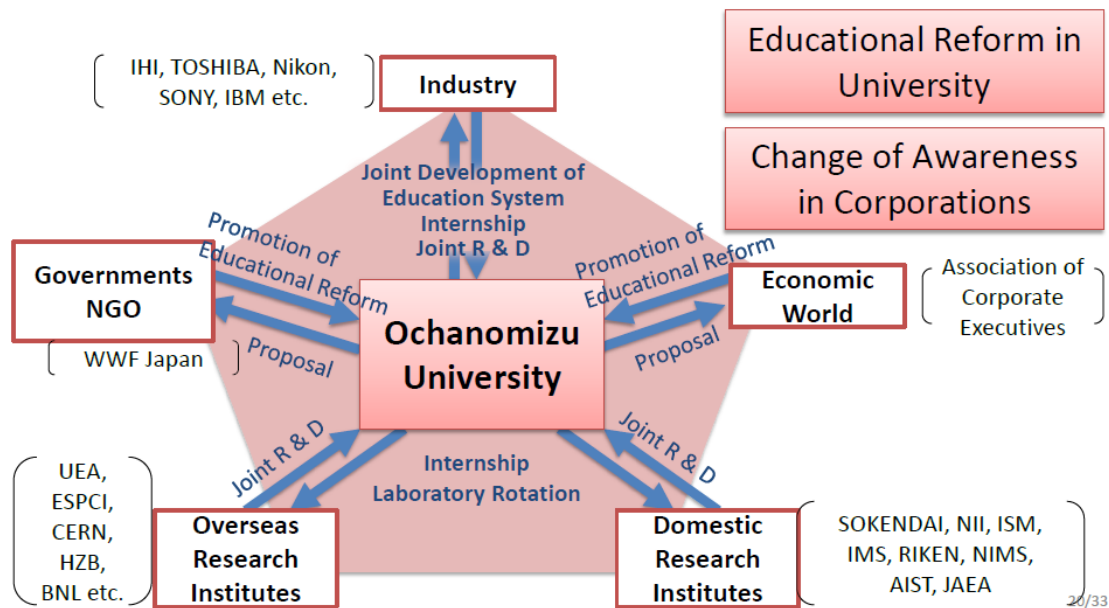


Image of Portfolio System

## 3. Taking a role of a hub for strong cooperation between industry, academia and government

A variety of talented people from industry, academia and government (SOKENDAI, RIKEN, NII, ISM, IMS, KEK, AIST, SONY, IHI, TOSHIBA, Nikon, and prominent companies and institutes overseas etc.) participate in this program as program members and/or advisory board members. Among those members, Ochanomizu University implements the program by taking a role of a hub for their cooperation. As a part of our program, laboratory rotation in partner institutions is performed to widen perspective and raise research capability.



## Program Members

### ■Members in Ochanomizu University

Name	Affiliation / Title
Tetsuya Kawamura	Managing Director, Vice President (International Exchange and Research Board Director), <b>Program Director</b>
Hazuki Furukawa	Graduate School of Humanities & Sciences, Advanced Sciences, Professor, <b>Program Coordinator</b>
Keiko Takano	Vice President (Academic and Information Board Director)
Akio Sugamoto	Graduate School of Humanities & Sciences, Advanced Sciences, Professor, Dean of Faculty of Science, <b>Deputy Program Coordinator</b>
Katsuyoshi Kobayashi	Graduate School of Humanities & Sciences, Advanced Sciences, Professor, Head of Advanced Sciences Dept.
Yuji Ohta	Graduate School of Humanities & Sciences, Life Sciences, Professor, Head of Life Sciences Dept.
Midori Kasai	Graduate School of Humanities & Sciences, Life Sciences, Professor, Head of Natural/Applied Sciences Division
Takayuki Ito	Graduate School of Humanities & Sciences, Advanced Sciences, Professor, Director of Center for Simulation Sciences
Kazuyoshi Chiba	Graduate School of Humanities & Sciences, Life Sciences, Professor, Director of Education & Research Center
Kei Yura	Graduate School of Humanities & Sciences, Life Sciences, Professor, Director of Center for Informational Biology
Motohisa Handa	Center for Research and Development of Education, Professor,
Masato Oguchi	Graduate School of Humanities & Sciences, Advanced Sciences, Professor
Toshihiro Kondo	Graduate School of Humanities & Sciences, Advanced Sciences, Professor
Itiro Siio	Graduate School of Humanities & Sciences, Advanced Sciences, Professor
Gichol Cho	Graduate School of Humanities & Sciences, Advanced Sciences, Professor
Kazumi Tsukada	Graduate School of Humanities & Sciences, Advanced Sciences, Professor
Tetsuo Deguchi	Graduate School of Humanities & Sciences, Advanced Sciences, Professor
Shinji Yamada	Graduate School of Humanities & Sciences, Advanced Sciences, Professor
Hiroaki Yoshida	Graduate School of Humanities & Sciences, Advanced Sciences, Professor
Etsuko Matsuura	Graduate School of Humanities & Sciences, Life Sciences, Professor
Sachiko Kitajima	Graduate School of Humanities & Sciences, Advanced Sciences, Associate Professor
Kazue Kudo	Graduate School of Humanities & Sciences, Advanced Sciences, Associate Professor
Hiroshi Kori	Graduate School of Humanities & Sciences, Advanced Sciences, Associate Professor
Aya Tanatani	Graduate School of Humanities & Sciences, Advanced Sciences, Associate Professor
Mariko Hagita	Graduate School of Humanities & Sciences, Advanced Sciences, Associate Professor
Hirotohi Mori	Graduate School of Humanities & Sciences, Advanced Sciences, Associate Professor
Takanori Kono	Ochanomizu University Academic Production, Assistant Professor

■Members outside Ochanomizu University

Name	Affiliation / Title
Naoyuki Takahata	The Graduate University for Advanced Studies (SOKENDAI), President
Masaki Ando	Tokyo University, National Astronomical Observatory of Japan, Associate Professor
Yoshiyasu Tamura	The Institute of Statistical Mathematics, Professor
Ichiro Sato	National Institute of Informatics, Professor
Kae Nemoto	National Institute of Informatics, Professor
Yasuhiro Okada	High Energy Accelerator Research Organization (KEK), Managing Director
Katsuo Tokushuku	High Energy Accelerator Research Organization (KEK), Professor
Kazuho Ikeo	National Institute of Genetics, Associate Professor
Kazuo Takimiya	RIKEN, Center for Emergent Matter Science, Group Director,
Gen Tatara	RIKEN, Center for Emergent Matter Science, Team Leader
Tetsuo Hanaguri	RIKEN, Center for Emergent Matter Science, Team Leader
Yuji Sugita	RIKEN, Chief Scientist
Michiko Yoshitake	National Institute for Materials Science, MANA Scientist
Hiroshi Eisaki	National Institute of Advanced Industrial Science and Technology, Group Leader
Dmitri Fedorov	National Institute of Advanced Industrial Science and Technology, Chief Scientist
Hidetoshi Kono	Japan Atomic Energy Agency, Group Leader
Nobuhiko Kubota	IHI Corporation, Director
Hanae Nozaki	TOSHIBA Corporation, Chief Scientist
Ayako Sugaya	Nikon Corporation
Mina Aoyama	Bridgestone Corporation
Miyoko Kojima	Hitachi Solutions, Ltd.
Yukako Uchinaga	Japan Women's Innovative Network (J-Win), Chairman of the board
Takako Hagiwara	SONY Corporation, Executive Manager
Masako Konishi	WWW Japan, Project Leader
Machiko Miyai	Panasonic Corporation, Executive
Yoko Kobayashi	NTT Com CHEO, CEO
Steven Hayward	University of East Anglia, Senior Lecturer
David Quéré	ESPCI & Ecole polytechnique, Professor
Nicolas ELLIS	CERN, Leader of ATLAS Trigger and Data Acquisition Group
David Alan Tennant	Helmholtz Center Berlin, Professor
Luis López-Remón	Lanxess GmbH, Senior Vice President
Shixia Liu	Microsoft Research Asia, Lead Researcher
Miku Hirano	Spicy Cinnamon, Pre. Ltd. CEO



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