Introduction to Environmental Leader Program

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Graduate School of Environmental Studies
Tohoku University, Japan
1. Introduction of Tohoku University

2. Introduction of Graduate School of Environmental Studies

3. Introduction of Environmental Leader Program
1. Introduction of Tohoku University

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3. Introduction of Environmental Leader Program
1. Introduction of Tohoku University

Location of the City of Sendai

- In North-East Japan
- Distance from Tokyo \(350\ km\)
- Travel time from Tokyo (by bullet train) \(1\ hr 35\ min\)

Population of Sendai City

\(1,030,000\)
1. Introduction of Tohoku University

- Established **June 22, 1907**
- The third Imperial University of Japan

- The **spirits** of the foundation of university
  1. Research First
  2. Open-door
  3. Practice-Oriented Research and Education
1. Introduction of Tohoku University

2010

- **2892 Teaching staffs**

- **18,225 students** (1511 International Students from 76 countries & regions).
Prize Winners in Tohoku University

Hans Heinrich Rohrer
1987 Physics laureate
Visiting Professor, Institute for Materials Research;
Honorary Doctor

Ahmed H. Zewail
1999 chemistry laureate
University Professor; Honorary Doctor

Koichi Tanaka
2002 chemistry laureate
Visiting Professor, Graduate School of Engineering;
Honorary Doctor

Peter Grunberg
2007 physics laureate
Visiting Professor, Institute for Materials Research; Honorary Doctor
Inoue Plan 2007

1. Strengthen educational and research functions by acquiring competitive funds
2. Promote Internationalization
Focus on making Tohoku University be one of the leading universities in the world

Tohoku University
Inoue Plan 2007

Environmental Problem
Developing Environmental Leaders
Contribute to Sustainable Development of the World

Internationalization
Development of the Global Standard
Top research
Improvement in International Education System
Open University

The Leading University of the World
Top five ranking of Japanese research institutions for all fields 1998-2008

(Thomson Reuters April 13, 2009)

<table>
<thead>
<tr>
<th>Rank</th>
<th>World Rank</th>
<th>Institution Name</th>
<th>No. of Citations</th>
<th>No. of Papers</th>
<th>Average No. of Citations</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>11</td>
<td>University of Tokyo</td>
<td>984,934</td>
<td>72,683</td>
<td>13.55</td>
</tr>
<tr>
<td>2</td>
<td>30</td>
<td>Kyoto University</td>
<td>684,431</td>
<td>53,017</td>
<td>12.91</td>
</tr>
<tr>
<td>3</td>
<td>34</td>
<td>Osaka University</td>
<td>604,720</td>
<td>45,532</td>
<td>13.28</td>
</tr>
<tr>
<td>4</td>
<td>64</td>
<td>Tohoku University</td>
<td>443,396</td>
<td>42,914</td>
<td>10.33</td>
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<tr>
<td>5</td>
<td>80</td>
<td>Japan Science and Technology Agency</td>
<td>392,578</td>
<td>21,677</td>
<td>18.11</td>
</tr>
</tbody>
</table>
Institution Rankings of articles cited (Tohoku university)

*Essential Science IndicatorsSM* (updated as of January 1, 2011 to cover the period, *January 1, 2000-October 31, 2010*)

<table>
<thead>
<tr>
<th>Field</th>
<th>Rank</th>
</tr>
</thead>
<tbody>
<tr>
<td>Materials Science</td>
<td>3rd</td>
</tr>
<tr>
<td>Physics</td>
<td>10th</td>
</tr>
<tr>
<td>Chemistry</td>
<td>20th</td>
</tr>
<tr>
<td>Engineering</td>
<td>52nd</td>
</tr>
<tr>
<td>All Fields</td>
<td>67th</td>
</tr>
</tbody>
</table>
## Rankings of some Institution of articles citied (SERMSS-related universities)

<table>
<thead>
<tr>
<th></th>
<th>KAIST</th>
<th>Tsinghua Univ.</th>
<th>Shanghai JiaoTong Univ.</th>
<th>Tongji Univ.</th>
<th>Jilin Univ.</th>
<th>Tohoku Univ.</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Materials Science</strong></td>
<td>31&lt;sup&gt;st&lt;/sup&gt;</td>
<td>9&lt;sup&gt;th&lt;/sup&gt;</td>
<td>37&lt;sup&gt;th&lt;/sup&gt;</td>
<td>221&lt;sup&gt;st&lt;/sup&gt;</td>
<td>46&lt;sup&gt;th&lt;/sup&gt;</td>
<td>3&lt;sup&gt;rd&lt;/sup&gt;</td>
</tr>
<tr>
<td><strong>Physics</strong></td>
<td>205&lt;sup&gt;th&lt;/sup&gt;</td>
<td>95&lt;sup&gt;th&lt;/sup&gt;</td>
<td>228&lt;sup&gt;th&lt;/sup&gt;</td>
<td>-</td>
<td>428&lt;sup&gt;th&lt;/sup&gt;</td>
<td>10&lt;sup&gt;th&lt;/sup&gt;</td>
</tr>
<tr>
<td><strong>Chemistry</strong></td>
<td>92&lt;sup&gt;nd&lt;/sup&gt;</td>
<td>55&lt;sup&gt;th&lt;/sup&gt;</td>
<td>247&lt;sup&gt;th&lt;/sup&gt;</td>
<td>662&lt;sup&gt;nd&lt;/sup&gt;</td>
<td>91&lt;sup&gt;st&lt;/sup&gt;</td>
<td>20&lt;sup&gt;th&lt;/sup&gt;</td>
</tr>
<tr>
<td><strong>Engineering</strong></td>
<td>40&lt;sup&gt;th&lt;/sup&gt;</td>
<td>17&lt;sup&gt;th&lt;/sup&gt;</td>
<td>55&lt;sup&gt;th&lt;/sup&gt;</td>
<td>339&lt;sup&gt;th&lt;/sup&gt;</td>
<td>330&lt;sup&gt;th&lt;/sup&gt;</td>
<td>52&lt;sup&gt;nd&lt;/sup&gt;</td>
</tr>
<tr>
<td><strong>All Fields</strong></td>
<td>347&lt;sup&gt;th&lt;/sup&gt;</td>
<td>250&lt;sup&gt;th&lt;/sup&gt;</td>
<td>334&lt;sup&gt;th&lt;/sup&gt;</td>
<td>1093&lt;sup&gt;rd&lt;/sup&gt;</td>
<td>506&lt;sup&gt;th&lt;/sup&gt;</td>
<td>67&lt;sup&gt;th&lt;/sup&gt;</td>
</tr>
<tr>
<td>ENVIRONMENT/ECOLOGY</td>
<td>-</td>
<td>386&lt;sup&gt;th&lt;/sup&gt;</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>345&lt;sup&gt;th&lt;/sup&gt;</td>
</tr>
</tbody>
</table>
1. Introduction of Tohoku University

2. Graduate School of Environmental Studies

3. Introduction of Environmental Leader Program
Mission of our school

Establish environmental science by the “integration of the humanities and natural sciences” to create sustainable society.
Establish the ability for building the environmental-harmonized society that is featured by recycling of energy and materials.
Development Footprints of our school

2003 2005 2006 2007 2008 2009 2010

Fundamental Courses
- Regional Environment & Socio-cultural Studies
- Geosystem & Energy Sciences
- Environmental Chemistry & Ecoengineering
- Ecomaterial Design & Process Engineering

Additional Courses
- International Post-Graduate Program In Human Security
- Graduate Program on Frontier Environmental Studies
- IPESS: International program for Environmental Sustainability Science
- JAPEX Satellite in ITB
- Strategic Environmental Management & Sustainable technology Solutions (SEMSSat)

Global 30 Program

Footprints of our school

International Program for Environmental Sustainability Science (IPESS)
Integration of multidiscipline studies
Feature of Research and Education

• Leading technology for usage of renewable energy
  Geothermal development, Photo catalyst, Solar energy, Accumulator, Fuel cell

• Leading technology of material recycling
  Urban mines, Artificial deposit, Resource recycling technology

• “Graduate Course in Strategic Environmental Management and Sustainable Technologies”:
  Japan’s first program of human resource development in environmental field.

Regional Environment, Environmental Economics, Environmental Social Science
Academic Staff and Student

- Professor 50
- Associate Professor 31
- Assistant Professor 37

- Graduate students
  - PhD course 121
  - Master course 213
5 Courses

- Regional Environment and Socio-Cultural Studies
- Geosystem and Energy Sciences
- Environmental Chemistry and Ecoengineering
- Ecomaterial Design and Process Engineering
- International Program for Environmental Sustainability Science
Outline

1. Introduction of Tohoku University

2. Graduate School of Environmental Studies

3. Introduction of Environmental Leader Program
International Environmental Leader Program on Strategic Energy and Resource Management and Sustainable Solutions (SERMSS)

*The Facade of Ecollab.(Eco-house), Tohoku University*
What is “SERMSS”? 

Strategic Energy and Resource Management and Sustainable Solutions (SERMSS) 

An education program designed to develop human resources that hold the key for solving the future environmental issues in Asia and Africa. 

= “Environmental Leader Program” 

The program was initiated at July, 2010. 

The education course will be started at April, 2011. 

Supported by “Japan Science and Technology Agency (JST)” (Special Coordination Funds for Promoting Science and Technology)
Fostering international environmental leaders who understand Environmental Problem in Asia and Africa; regional pollution problem, global environmental problem, especially, energy, resources, water and urban environments.

The aim of environmental leaders in Asia and Africa:

- **Bird’s-eye view**
  - Understanding of:
    - Global and regional problems
    - International affairs

- **High degree of specialization on Energy, Resource and Water**
  - Advanced technology
  - Policy
  - Analytical skills

- **Strategic planning**
  - Abilities for:
    - Managements
    - Strategy planning

Pioneering achievements of Tohoku university for research and education in energy and resources.
Environmental Leader Education will train students to solve environmental problems with advanced technical knowledge.

### High degree of specialization by each Educational Course

<table>
<thead>
<tr>
<th>Course</th>
<th>Details</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Regional Environment and Socio-Cultural Studies</td>
<td></td>
</tr>
<tr>
<td>2. Geosystem and Energy Sciences</td>
<td></td>
</tr>
<tr>
<td>3. Environmental Chemistry and Ecoengineering</td>
<td></td>
</tr>
<tr>
<td>4. Ecomaterial Design and Process Engineering</td>
<td></td>
</tr>
<tr>
<td>5. International Program for Environmental Sustainability Science</td>
<td></td>
</tr>
</tbody>
</table>
Features of “SERMSS”

Courses for “SERMSS”

**Regular Course**
(Educational courses in Environmental Studies)

<table>
<thead>
<tr>
<th>Credits required for SERMSS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Conventional Education</td>
</tr>
<tr>
<td>Master course</td>
</tr>
<tr>
<td>Doctor course</td>
</tr>
</tbody>
</table>

Master course: 4 Japanese/year, 4 foreigners/year
Doctor course: 2 Japanese/year, 2 foreigners/year

**Basic Course**
(Less than 1-year education for visitors)

Environmental Leader Training Course
I (corresponds with regular master course)
II (corresponds with regular doctor course)
## Curriculum: Master Course (Regular Course)

<table>
<thead>
<tr>
<th>Master course</th>
<th>Subject</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>Integrative skills</td>
<td></td>
<td></td>
</tr>
<tr>
<td>E-learn</td>
<td>Solution creation</td>
<td>2</td>
</tr>
<tr>
<td></td>
<td>Environmental management and business</td>
<td>2 req</td>
</tr>
<tr>
<td></td>
<td>Sustainability</td>
<td>2 req</td>
</tr>
<tr>
<td>Training</td>
<td>Environmental leader practical training</td>
<td>4 req</td>
</tr>
<tr>
<td></td>
<td>Environmental leader seminar</td>
<td>2 req</td>
</tr>
<tr>
<td>Total</td>
<td></td>
<td>12</td>
</tr>
<tr>
<td>Expertise*</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Class</td>
<td>Strategy for energy and resources</td>
<td>2 req</td>
</tr>
<tr>
<td></td>
<td>Water and urban environments</td>
<td>2 req</td>
</tr>
<tr>
<td>Total</td>
<td></td>
<td>4</td>
</tr>
</tbody>
</table>

* Included in elective subjects for conventional courses.
<table>
<thead>
<tr>
<th>Doctor course</th>
<th>Subject</th>
<th>credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>Integrative skills*</td>
<td>Training</td>
<td>Environmental leader internship</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Environmental leader special training I</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Environmental leader special training II</td>
</tr>
<tr>
<td></td>
<td></td>
<td><strong>Total</strong></td>
</tr>
<tr>
<td>Expertise</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td><strong>Total</strong></td>
</tr>
</tbody>
</table>

* Interactive skills in “Master course” may be required depend on his/her skills.
Certificate

• Certificate will be offered to students upon completion of each program.

• Selected excellent students will be certified as “Professional”.
Learning of integrative skills, especially;
manage the basis of global environmental
problems in the fields of energy, resources and
water.
practical and international perspective.

School expense subsidies
Both for Master and Doctor Courses.
SERMSS Program Members in Tohoku Univ.

**Program Members**

**Representative Members**

**Instructors**

All members in the Graduate School of Environmental Studies take charge of this program. Also, special lectures will be provided by the invited international experts.
SERMSS environmental leader program is attracting wide interests from more and more foreign government organizations, groups, and famous universities.
Cooperative network for Environmental Leader

**Korea**
Korea Advanced Institute of Science and Technology

**China**
Tsinghua University
Tongji University
Shanghai Jiao Tong University
Xian University of Architecture and Technology
Jilin University

**Vietnam**
HoChiMinh City University of Technology
Hanoi University of Technology

**Indonesia**
Bandung Institute of Technology
Brawijaya University

**Thailand**
Chulalongkorn University

**India**
Indian Institute of Technology
Access to SERMSS Program in Tohoku University

For more information, please visit:
http://www.kankyo.tohoku.ac.jp/sermss/index.html

Please input “SERMSS” in Google
Look forward to our fruitful collaboration

Thanks for your attention!