# *Japan-Turkey Cooperative Program on Resilience Engineering for Energy and Urban Systems*

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## *Background and Project Overview*

- **Cooperation between Japan and Turkey can generate synergy effects especially in the field of safety of energy and urban systems**
  - ✓**Similarity between the two countries (e.g., Japan and Turkey are located in one of the most seismically active regions in the world)**
- **Top engineering universities in both countries collaborate to create research and education initiatives for human resource development by creating engineers with managing capability of complex systems**
  - ✓**UTokyo, Tokyo Tech (Japanese side)**
  - ✓**ITU, METU and BU (Turkish side)**

## *Overview: Japan-Turkey Cooperative Program*

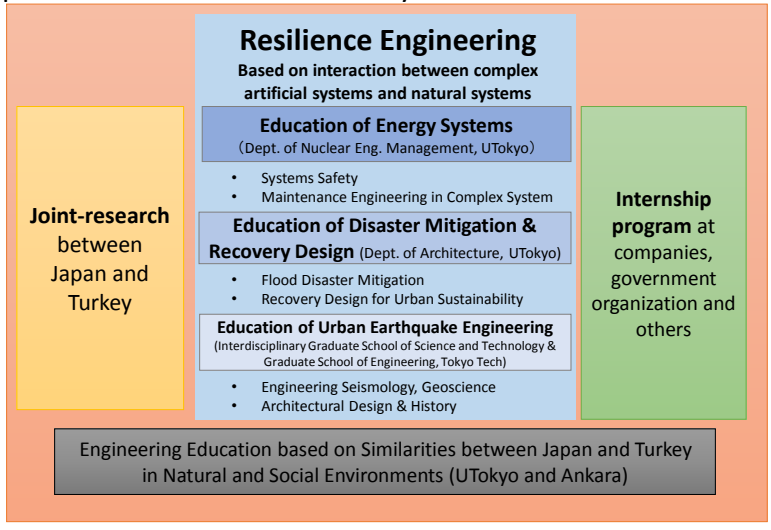
- **Grant from MEXT (Ministry of Education and Culture, Sports, Science and Technology) of Japan**
- **Five-year funding term (FY2015-2019)**

- **Japanese Universities**
  - **The University of Tokyo (UTokyo)**
  - **Tokyo Institute of Technology (TokyoTech)**
- **Turkish Universities**
  - **Istanbul Technical University (ITU)**
  - **Middle East Technical University (METU)**
  - **Boğaziçi University (Ankara University)**

- **Project Steering Committee**
  **Chaired by Dean, Mitsuishi (School of Eng, UTokyo)**
- **External Evaluation Committee**
  **Chaired by Ms. Atsuko Toyama**
  **(Former Minister of Education, Former Ambassador to Turkey)**

## *Framework: Japan-Turkey Cooperative Program*

Creation of leading engineers with management capability based on the collaborative research and education between 2 Universities in Japan and 3 Universities in Turkey



# *Short-term Student Exchange Program*

## ➢ Planned Number of Exchange Students

| | 2015 | 2016 | 2017 | 2018 | 2019 |
|---|---|---|---|---|---|
| Japan to Turkey | 14 | 17 | 18 | 18 | 18 |
| Turkey to Japan | 16 | 19 | 19 | 19 | 19 |

## ➢ Program for Turkish students in Japan

- Japanese Language and Culture
- Lectures of "Resilience Engineering" and Related Topics
- Participating Research Activities
- Visit to Engineering Companies
  - MHI Mitsubishi Heavy Industry
  - Taisei Corporation



# *Short-term Student Exchange in January 2016 (Turkey to Japan)*

<table>
<tr><th></th><th>Course 1<br>(University of Tokyo )</th><th>Course 2<br>(Tokyo Institute of Technology )</th></tr>
<tr><td>Jan 11</td><td colspan="2">Flight from Istanbul to Tokyo</td></tr>
<tr><td>Jan 12</td><td colspan="2">Lectures on the Japanese language and culture at UTokyo followed by a reception</td></tr>
<tr><td>Jan 13</td><td rowspan="3">Lectures and exercises on resilience engineering (systems safety, nuclear safety, maintenance engineering, disaster management, and earthquake and tsunami engineering)</td><td rowspan="3">Exercises on urban earthquake engineering</td></tr>
<tr><td>Jan 14</td></tr>
<tr><td>Jan 15</td></tr>
<tr><td>Jan 16</td><td colspan="2" rowspan="2">Cultural experience and excursions in Tokyo (or Osaka/Kyoto for some Course 1 students) with graduate students from UTokyo</td></tr>
<tr><td>Jan 17</td></tr>
<tr><td>Jan 18</td><td colspan="2" rowspan="2">Internship program at engineering companies</td></tr>
<tr><td>Jan 19</td></tr>
<tr><td>Jan 20</td><td colspan="2">Flight from Tokyo/Osaka to Istanbul</td></tr>
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# *Short-term Student Exchange in January 2016 (Turkey to Japan)*

## Participating Students

UTokyo TokyoTech

| Q1: What is your current level of education? | UTokyo | TokyoTech | |
|---|---|---|---|
| 1. PhD student | 6 | 4 | 10 |
| 2. Masters student | 4 | 3 | 7 |
| 3. Undergraduate students | | | 0 |

| Q2: What department do you belong to? | UTokyo | TokyoTech | |
|---|---|---|---|
| 1. Structural Engineering | 3 | 2 | 5 |
| 2. Hydraulics | 1 | | 1 |
| 3. Construction Management | 1 | | 1 |
| 4. Earthquake Engineering | 1 | 2 | 3 |
| 5. Mechanical Engineering | 1 | | 2 |
| 6. Soil Mechanics | | | 1 |
| 7. Energy Institute | 2 | | 2 |
| 8. Civil Engineering | 1 | | 1 |
| 9. Other( ) | 1 | | 1 |
| Soil Mechanics and Geotechnical Engineering Program | 1 | | 1 |

## Overall Rating

UTokyo TokyoTech

| Q4: How do you rate the following aspects of the university? | Not important 1 | 2 | 3 | 4 | Very Important 5 | |
|---|---|---|---|---|---|---|
| 1. Provision of materials | | | | | | 4.8 |
| 2. Quality of lectures in English | | | | | | 4.5 |
| 3. Feedback and engagement with teachers | | | | | | 4.8 |

| Q5: Do you want to come to Japan again (for longer research, degree program, and/or future business) after this student exchange program? | UTokyo | TokyoTech | |
|---|---|---|---|
| 1. Yes | 10 | 7 | 17 |
| 2. No | | | 0 |
| 3. Can't say | | | 0 |

| Q7: How close will your future Job or career be to what you studied? | UTokyo | TokyoTech | |
|---|---|---|---|
| 1. Very close | 4 | 3 | 7 |
| 2. Slightly close | 6 | 3 | 9 |
| 3. Not close at all | | | 0 |
| 4. Don't know | | | 1 |
| 5. Other | | | 0 |

| Q8: Would you recommend studying at the UTokyo/TokyoTech to your friends? | UTokyo | TokyoTech | |
|---|---|---|---|
| 1. Yes | 10 | 7 | 17 |
| 2. No | | | 0 |
| 3. Can't say | | | 0 |

## Japanese Food

| Q9: Do you have any difficulty in food during your stay in Japan? | | | |
|---|---|---|---|
| 2. No | 5 | 5 | 10 |
| 1. Yes (If yes, please describe in detail) | 5 | 2 | 7 |

- Especially, tastes(spices) are different from what we generally use. But, I can develop this issue.
- Because of finding "halal" food in Japan is a little bit hard, yet.
- Firstly row fishes are different from our culture, but then I got used to eating all; sashimi salmon is my favorite one.
- Japanese food is very delicious. I tried every food. I like it. Your fish is very delicious.

## General Comments by Participants

- First of all program was excellent. Nevertheless the time limitation may prevented the discussing on the topics sometime. Therefore, I think the duration of the course should be a little longer.
- Before I come to Japan, I was interested in Tokyo, Japanese language and Japanese traditional. I find Tokyo amazing. And lectures was easy to understand. The contents of lectures will be very useful for my future. I will recommend to my friends to study at the University of Tokyo and I will look for opportunities to come Japan again.
- Very short period of time was not enough to get involved more into Japanese culture. But it was enough to become excited about university level of education and quality of study. Some program certification might be very useful.

## General Comments by Participants

- I had the chance to experience life in Japan. This short-term exchange program gave me an opportunity to meet new students and researchers. I really enjoyed the research program
- The student exchange program is a good chance to learn Japanese education systems, technologies and culture. New ideas are created in my mind by this program for my future academic career. It presents too much advantages (…) to learn the differences and similarities in our cultures in terms of behaviors and foods. I think, it will be more useful if the duration of the student exchange program is increased. (…)

## Lectures on Japanese Language and Culture

| Q3: Do you feel that lectures were well prepared and well planned? | |
|---|---|
| 1. All were unplanned and unprepared | 1 |
| 2. A shortage of planning/preparation | 0 |
| 3. Average | 0 |
| 4. Well planned and prepared | 3 |
| 5. Very well prepared and planned | 14 |

| Q4: What do you think about the speed/pace of the class? | |
|---|---|
| 1. Very fast | 0 |
| 2. Fast | 1 |
| 3. Just right | 17 |
| 4. Slow | 0 |
| 5. Very slow | 0 |

| Q5: Do you think the class instructor demonstrated enthusiasm for the course? | |
|---|---|
| 1. There was no enthusiasm | 0 |
| 2. Very little enthusiasm | 0 |
| 3. Average | 0 |
| 4. Enthusiastic | 2 |
| 5. Very enthusiastic | 16 |

# Lectures on Japanese Language and Culture

| Q8: Did you had an interest in Japanese language and culture before this course? | |
|---|---|
| 1. Yes | 12 |
| 2. No | 3 |
| 3. Can't say | 3 |

| Q9: Did you experience an increase an interest in Japanese language and culture after this lesson? | |
|---|---|
| 1. No interest, no increase in motivation | 0 |
| 2. Not much interest nor increase in motivation | 0 |
| 3. Average | 1 |
| 4. Interest in subject, increase in motivation | 6 |
| 5.Very interested in subject, and increase in motivation | 11 |

| Q11: Do you feel that this class was useful for your future? | |
|---|---|
| 1. Absolutely not | 0 |
| 2. Not particularly | 0 |
| 3. I cannot say either way | 1 |
| 4. Useful for my future | 10 |
| 5. Very useful for my future | 7 |

# Lectures on Japanese Language and Culture

- It was avocatory, amusing and instructive. Especially tea ceremony was great!
- It was the funniest language lecture that I took.
- Very well prepared Japanese culture and language courses. Courses are very helpful to live and share something with Japanese.

# Lectures on Resilience Engineering/ Research at host professor

| Q3: Do you feel that internship program were well prepared and well planned? | UTokyo | TokyoTech |
|---|---|---|
| 1. All were unplanned and unprepared | | |
| 2. A shortage of planning/preparation | | |
| 3. Average | | |
| 4. Well planned and prepared | 3 | 2 |
| 5. Very well prepared and planned | 7 | 5 |

| Q4: What do you think about the speed/pace of the class? | | |
|---|---|---|
| 1. Very fast | | |
| 2. Fast | 2 | 1 |
| 3. Just right | 8 | 5 |
| 4. Slow | 1 | |
| 5. Very slow | | |

| Q5: Do you think the instructor demonstrated enthusiasm for the course? | | |
|---|---|---|
| 1. There was no enthusiasm | | |
| 2. Very little enthusiasm | | |
| 3. Average | | |
| 4. Enthusiastic | 2 | 1 |
| 5. Very enthusiastic | 8 | 6 |

# Lectures on Resilience Engineering/ Research at host professor

| Q8: Did you experience an increase an motivation for this subject after this lesson? | UTokyo | TokyoTech |
|---|---|---|
| 1. No interest, no increase in motivation | | |
| 2. Not much interest nor increase in motivation | | |
| 3. Average | | |
| 4. Interest in subject, increase in motivation | 5 | 3 |
| 5.Very interested in subject, and increase in motivation | 5 | 4 |

| Q9: Following this course, were you able to gain knowledge and capabilities related to area of study? | | |
|---|---|---|
| 1. Absolutely not | | |
| 2. Not particularly | | |
| 3. I cannot say either way | | |
| 4. I think so | 5 | 3 |
| 5. Very much so, yes | 5 | 4 |

| Q10: Do you feel that this class was useful for your future? | | |
|---|---|---|
| 1. Absolutely not | | |
| 2. Not particularly | | |
| 3. I cannot say either way | | |
| 4. Useful for my future | 2 | 3 |
| 5. Very useful for my future | 8 | 4 |

## Lectures on Resilience Engineering

- The contents of the lectures made me realize, that resilience engineering is a very large topic, that includes many subtopics from different engineering area and I'm very interested in this area.
- As a mechanical engineer, (…) at first, I am focused on the energy production, turbine generator part. But after this program, I can easily focus all plant with safety of design basis. I can estimate the possible risks for NPP. All of these, I have understand the word of 'resilience' detailed.

## Lectures on Resilience Engineering

- The contents of the lecture were excellent. Nevertheless, the time limitations caused less conservations about the topics. (…)
- I am structural engineer. I kindly suppose that contents of lectures may be riched with adding of design of nuclear plant structures in terms of structural engineering (For example, design of containment structures, actions, possible loads, acceptance criteria). (…)

# Lectures on Resilience Engineering

- Very intensive sequence of lecture and huge amount of information that needs time to comprehensive and requires decision. It was very useful anyway. Lecturers are professionals and very well experienced.

# Research at host professor

- The host professor and his research lab are very kind and helpful. The content of seminar gives enough knowledge about the research conducted TIT
- Seminars are well organized and planned. Also they have some key points and interpreters about my research field.

# Internships

Taisei | MHI | MHI (Japanese students) | Oyo

| Q3: Do you feel that internship program were well prepared and well planned? | |
|---|---|
| 1. All were unplanned and unprepared | 0 |
| 2. A shortage of planning/preparation | 0 |
| 3. Average | 1 |
| 4. Well planned and prepared | 10 |
| 5. Very well prepared and planned | 9 |

| Q4: Do you think the instructor demonstrated enthusiasm for the program | |
|---|---|
| 1. There was no enthusiasm | 0 |
| 2. Very little enthusiasm | 0 |
| 3. Average | 1 |
| 4. Enthusiastic | 4 |
| 5. Very enthusiastic | 15 |

| Q6: Did you experience an increase an motivation for this subject after this program? | |
|---|---|
| 1. No interest, no increase in motivation | 0 |
| 2. Not much interest nor increase in motivation | 0 |
| 3. Average | 4 |
| 4. Interest in subject, increase in motivation | 4 |
| 5.Very interested in subject, and increase in motivation | 12 |

# Internships

Taisei | MHI | MHI (Japanese) | Oyo

| Q7: Following this program, were you able to gain knowledge and capabilities related to the area of study? | |
|---|---|
| 1. Absolutely not | 0 |
| 2. Not particularly | 0 |
| 3. I cannot say either way | 0 |
| 4. I think so | 10 |
| 5. Very much so, yes | 10 |

| Q8: Do you feel that this class was useful for your future? | |
|---|---|
| 1. Absolutely not | 0 |
| 2. Not particularly | 0 |
| 3. I cannot say either way | 0 |
| 4. Useful for my future | 6 |
| 5. Very useful for my future | 14 |



## Internship in Taisei Corporation

- In overall, the program was quite successful. I was very excited to be here. Only one topic that I want to add is that may be lecture related with structural design of nuclear power plants can be increased. This would be helpful to increase our ability to design safety structures well.
- The program was quite excellent and useful for may future works. Taisei is an amazing company with its experimental facilities. It was a pleasure to attend some kind of tests and seeing other facilities. Thank you very much for your hospitality and help.

## Internship in MHI

- I have basic knowledge about NPP before being in Japan. After this program, I have detailed knowledge about inspection and operation of NPP and auxiliaries. In this way maybe the program can be extended by some feasibility to students. Approximately electricity generation, investment cost, advantages and disadvantages of NPP, etc. All of that was good, we learned many things in Japan...
- Thank you for giving this internship opportunity. Simulation & NDI experiments was fascinating. I definitely want to visit Japan & MHI. "Mata!"

**MHI : Mitsubishi Heavy Industry**

## Internship (Oyo Corporation)

- The site survey that we involved was informative and helpful. I think that the internship program is intensive for two-days, we have good enough knowledge about the firm.
- The internship is very beneficial to meet with professionals (…). It is a good chance to learn Oyo Corporation's projects in all around the world and their research fields. Construction and geotechnical engineering facilities really take my attention. I want to work in some of the projects of Oyo in near future.

## *Future Plan to be discussed*

- Student Exchange Programs
- Joint Workshops
- Collaborative Research
- Joint Funding
- Others

## *Future Perspectives*
## TJU : Turkey-Japan Science and Technology University

- **Strong support by both governments**
  - TJU campus will be established at Asian side of Istanbul
  - Very close to the Sabiha Gokcen Airport
  - Next to the Teknopark Istanbul
- **Research collaboration between universities and companies from Turkey, Japan and other countries will be strongly encouraged in the University**
- **Many faculty members and engineers from Japan will join the University for research and education**
  - Graduate School of Interdisciplinary Engineering and Sciences
  - Additional undergraduate schools are also planned