PROGRAM GUIDE

TOHOKU UNIVERSITY
ENGINEERING
SUMMER PROGRAM
2016

JULY 25 - AUGUST 5
Robotics Course

School of Engineering, Tohoku University
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Overview

Tohoku University and TESP 2016:

Tohoku University was founded in 1907 as the third Imperial University of Japan. Located in Sendai City, the heart of the east-north area of Japan, Tohoku University continues to offer students a world-class education, and an opportunity to succeed in conducting pioneer research. Students at Tohoku University can experience the history, Japanese culture, the natural beauty, as well as a world-class education. Graduate School of Engineering, Tohoku University will be offering a two-week summer program graduate level focusing on “Robotics,” and “Electrical & Electronic Engineering” a new program launched this year. Both programs are designed to inspire graduate level (MSc and PhD) students or young professionals in the field of Engineering. The program provides a series of English lectures and hands-on activities on the advanced topics of robotics & Electrical and Electronic Engineering. In addition, the program includes various activities that expose the participants to Japanese culture to enrich their academic experience. The program overall aims to provide students rich academic and cultural experience for their academic and global insight.
# Daily Schedule - Robotics

## Week 1

<table>
<thead>
<tr>
<th>July 24 (Sun)</th>
<th>July 25 (Mon)</th>
<th>July 26 (Tue)</th>
<th>July 27 (Wed)</th>
<th>July 28 (Thu)</th>
<th>July 29 (Fri)</th>
<th>July 30 (Sat)</th>
</tr>
</thead>
<tbody>
<tr>
<td>8:50</td>
<td>10:20</td>
<td>9:30</td>
<td>10:20</td>
<td>9:30</td>
<td>10:20</td>
<td>8:50</td>
</tr>
<tr>
<td>Arrival</td>
<td></td>
<td>CH2F</td>
<td></td>
<td></td>
<td></td>
<td>Field Trip</td>
</tr>
<tr>
<td>10:20</td>
<td></td>
<td>Opening Ceremony</td>
<td></td>
<td></td>
<td></td>
<td>(Tentative)</td>
</tr>
<tr>
<td>Hotel Check-In</td>
<td>14:00-</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>8:30-</td>
</tr>
<tr>
<td>10:30</td>
<td></td>
<td>CH2F</td>
<td></td>
<td></td>
<td></td>
<td>Leaving Hotel</td>
</tr>
<tr>
<td>Disaster Robotics</td>
<td>(Tadokoro)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>12:00</td>
<td>13:00</td>
<td>CH1F &quot;DOCK&quot;</td>
<td>Welcome Lunch</td>
<td>Lunch</td>
<td>Lunch</td>
<td>Lunch</td>
</tr>
<tr>
<td>12:00</td>
<td>13:00</td>
<td></td>
<td>Lunch</td>
<td>Lunch</td>
<td>Lunch</td>
<td>Lunch</td>
</tr>
<tr>
<td>13:00</td>
<td></td>
<td>CH2F</td>
<td>Laboratory Hands-On Activity @ each lab.</td>
<td>Open Campus</td>
<td>Open Campus</td>
<td>Laboratory Hands-On Activity @ each lab.</td>
</tr>
<tr>
<td>14:30</td>
<td></td>
<td></td>
<td>Lab Visit</td>
<td>Lab Visit</td>
<td></td>
<td></td>
</tr>
<tr>
<td>14:40</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>16:10</td>
<td></td>
<td></td>
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<td></td>
</tr>
</tbody>
</table>

- CH: Center Hall (C01)
- #611: Research Building M.A.E. (A15) Room #611
- AMH: Aoba Memorial Hall (C03)

- ◇ - Ceremony, Student Activity
- ◇ - Lecture
- ◇ - Laboratory
<table>
<thead>
<tr>
<th>Time</th>
<th>July 31 (Sun)</th>
<th>August 1 (Mon)</th>
<th>August 2 (Tue)</th>
<th>August 3 (Wed)</th>
<th>August 4 (Thu)</th>
<th>August 5 (Fri)</th>
<th>August 6 (Sat)</th>
</tr>
</thead>
<tbody>
<tr>
<td>8:50</td>
<td></td>
<td>【#611】Robotics for Human Assistance I (Hirata)</td>
<td>【#611】Medical and Health Care Applications of Microsystem Technologies (Haga)</td>
<td>【#611】Haptic Interfaces (Konyo)</td>
<td>【#611】Visual Servo and Its Application in Robotics (Hashimoto)</td>
<td>Hands-On Activity (Preparation for Final Presentation) @ each lab</td>
<td>Hotel Check-Out (-11:00)</td>
</tr>
<tr>
<td>10:20</td>
<td></td>
<td></td>
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<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>10:30</td>
<td></td>
<td>【#611】Robotics for Human Assistance II (Hirata)</td>
<td>【#611】Field Robotics (Nagatani)</td>
<td>【#611】Micro-satellites and Micro-Rovers (Yoshida)</td>
<td>【#611】Cameras and Image Sensors (Kagami)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>12:00</td>
<td>Lunch</td>
<td>Lunch</td>
<td>Lunch</td>
<td>Lunch</td>
<td>Lunch</td>
<td>Lunch</td>
<td></td>
</tr>
<tr>
<td>12:00</td>
<td>Lunch</td>
<td>Lunch</td>
<td>Lunch</td>
<td>Lunch</td>
<td>Lunch</td>
<td>Lunch</td>
<td></td>
</tr>
<tr>
<td>13:00</td>
<td>Laboratory Hands-On Activity @ each lab.</td>
<td>【AMH7F】12:30〜Japanese Culture Program</td>
<td>Laboratory Hands-On Activity @ each lab.</td>
<td>Laboratory Hands-On Activity @ each lab.</td>
<td>13:00-16:30【CH2F】Final Presentation</td>
<td></td>
<td></td>
</tr>
<tr>
<td>14:30</td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>14:40</td>
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<td></td>
</tr>
<tr>
<td>16:10</td>
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<td></td>
<td></td>
<td></td>
<td></td>
<td>16:30【CH2F】Closing Ceremony</td>
<td></td>
</tr>
<tr>
<td></td>
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<td></td>
<td></td>
<td></td>
<td></td>
<td>19:00 ~ 21:00【Restaurant Hagi】Farwell Party</td>
<td></td>
</tr>
</tbody>
</table>

◇ CH: Center Hall (C01) ◇ #611: Research Building M.A.E. (A15) Room #611 ◇ AMH: Aoba Memorial Hall (C03)
<table>
<thead>
<tr>
<th>Time</th>
<th>Title</th>
<th>Place</th>
<th>Professors</th>
</tr>
</thead>
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<tr>
<td><strong>July 25</strong>, Mon 10:30-12:00</td>
<td>Disaster Robotics</td>
<td>Center Hall 2F Conf. Room</td>
<td>Prof. Satoshi Tadokoro</td>
</tr>
<tr>
<td><strong>July 26</strong>, Tue 8:50-10:20</td>
<td>Space Robotics I</td>
<td>Room #611</td>
<td>Prof. Kazuya Yoshida</td>
</tr>
<tr>
<td><strong>July 26</strong>, Tue 10:30-12:00</td>
<td>Space Robotics II</td>
<td>Room #611</td>
<td>Prof. Kazuya Yoshida</td>
</tr>
<tr>
<td><strong>July 27</strong>, Wed 8:50-10:20</td>
<td>Computer Vision I</td>
<td>Room #611</td>
<td>Prof. Takayuki Okatani</td>
</tr>
<tr>
<td><strong>July 27</strong>, Wed 10:30-12:00</td>
<td>Computer Vision II</td>
<td>Room #611</td>
<td>Prof. Takayuki Okatani</td>
</tr>
<tr>
<td><strong>July 28</strong>, Thu 8:50-10:20</td>
<td>Molecular Robotics I</td>
<td>Room #611</td>
<td>Prof. Satoshi Murata</td>
</tr>
<tr>
<td><strong>July 28</strong>, Thu 10:30-12:00</td>
<td>Molecular Robotics II</td>
<td>Room #611</td>
<td>Prof. Satoshi Murata</td>
</tr>
<tr>
<td><strong>July 29</strong>, Fri 8:50-10:20</td>
<td>Robotics as Systems Integration, an Overview I</td>
<td>Room #611</td>
<td>Prof. Kazuhiro Kosuge</td>
</tr>
<tr>
<td><strong>July 29</strong>, Fri 10:30-12:00</td>
<td>Robotics as Systems Integration, an Overview II</td>
<td>Room #611</td>
<td>Prof. Kazuhiro Kosuge</td>
</tr>
<tr>
<td><strong>August 1</strong>, Mon 8:50-10:20</td>
<td>Robotics for Human Assistance I</td>
<td>Room #611</td>
<td>Prof. Yasuhisa Hirata</td>
</tr>
<tr>
<td><strong>August 1</strong>, Mon 10:30-12:00</td>
<td>Robotics for Human Assistance II</td>
<td>Room #611</td>
<td>Prof. Yasuhisa Hirata</td>
</tr>
<tr>
<td><strong>August 2</strong>, Tue 8:50-10:20</td>
<td>Medical and Health Care Applications of Microsystem Technologies</td>
<td>Room #611</td>
<td>Prof. Yoichi Haga</td>
</tr>
<tr>
<td><strong>August 2</strong>, Tue 10:30-12:00</td>
<td>Field Robotics</td>
<td>Room #611</td>
<td>Assoc. Prof. Keiji Nagatani</td>
</tr>
<tr>
<td><strong>August 3</strong>, Wed 8:50-10:20</td>
<td>Haptic Interfaces</td>
<td>Room #611</td>
<td>Assoc. Prof. Masashi Konyo</td>
</tr>
<tr>
<td><strong>August 3</strong>, Wed 10:30-12:00</td>
<td>Micro-satellites and Micro-rovers</td>
<td>Room #611</td>
<td>Prof. Kazuya Yoshida</td>
</tr>
<tr>
<td><strong>August 4</strong>, Thu 8:50-10:20</td>
<td>Visual Servo and Its Application in Robotics</td>
<td>Room #611</td>
<td>Prof. Koichi Hashimoto</td>
</tr>
<tr>
<td><strong>August 4</strong>, Thu 10:30-12:00</td>
<td>Cameras and Image Sensors</td>
<td>Room #611</td>
<td>Assoc. Prof. Shingo Kagami</td>
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</tbody>
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"Medical and Health Care Applications of Microsystem Technologies"

Abstract
Using microfabrication technologies called micromachining and nanotechnology, small medical devices with several functions for use in the human body have been developed. Several new technologies, for example, MEMS (Micro Electro Mechanical Systems) technologies, ultra-precision machining, laser machining are used for fabrication. Minimally invasive examinations and therapies with endoscopes and catheters are already widely performed, and new more precise examinations and diagnoses which have been impossible to date can now be realized by installing microsensors in these medical devices. Furthermore, more precise and safe surgical treatment can be realized by installing microactuators (shape memory alloy, piezoelectric elements, etc.) in the minimally invasive therapeutic devices. Thin, soft and small wearable health care devices which is mounted on human body surface enable new useful measurement item in daily life, for example fatigue and stress level.

Research Interests
(1) Active Catheter and Endoscope Using Shape Memory Alloy Actuators
(2) Ultra Miniature Fiber-Optic Pressure Sensor
(3) Intravascular Forward-looking Ultrasonic Probe
(4) Wearable-type Healthcare Devices

Honors and Awards
2014 Best Paper Award (Engineering), Japan Society of Computer Aided Surgery
2012 IEEJ Technical Development Award, The Institute of Electrical Engineers of Japan
2007 Best Paper Award, Japanese Society for Medical and Biological Engineering
2004 Best Presentation Award, Welfare Engineering Symposium, The Japan Society of Mechanical Engineers
2004 Best Paper Award, Japan Society of Computer Aided Surgery
2002 JSAO-Grant, Japanese Society for Artificial Organs
“Visual Servo and Its Application in Robotics”

Abstract
Visual servo is a feedback control framework useful for robot motion generation. It can also be used for robust image processing. Using high-speed cameras image processing algorithms with feedback structure presents outstanding robustness. A parallel processing algorithm suitable for GPU architectures will be introduced. In this lecture, many visual servo applications of robot manipulation systems including robotic manufacturing, visual inspection, and microscope robots are presented.

Research Interests
1. Theoretical issues in visual servo
2. High-speed vision systems and high-speed image processing algorithms
3. GPU programming
4. Visual servo microscope
5. Optogenetic motion control of micro bio-systems
6. Fluorescent 3D measurement of neural activity from freely moving animals.

Honors and Awards
2013 Vice-Dean of GSIS
2013 Fellow, SICE
2011 Assistant for University President
2011 Best Contribution Award, Society of Instrument and Control Engineers (SICE)
2010 Best Paper Award, Journal of Institute of Systems, Control and Information Engineering
2009 Best Paper, IEEE Int. Conf. Mechatronics and Automation
2006 Best Biomimetics Paper, IEEE Int. Conf. Robotics and Biomimetics
2005 Best Mechatronics Paper, IEEE Int. Conf. Mechatronics and Information Technology
1994 Young Investigator Excellence Award, Robotics Society of Japan
Abstract
Most of robots have been used as industrial robots in factories to replace humans doing tasks, which humans do not want to do or could not do, and have been isolated from humans. Recently, however, we expect to utilize robot systems not only in the industrial fields but also in the fields such as home, office, and hospital in cooperation with human. For realizing the physical supports for human being by using the robot systems, we have to consider two main points: achieving high performance and user safety. In this lecture, the human-robot cooperation systems for augmenting the human performance will be given. In addition, the passive robotics concept, which can realize the high-safety robot, will be introduced, and the motion control methods of several passive robots will be lectured.

Research Interests
Human-Robot Cooperation
Assistive Robot
Passive Robot
Multiple Robots Coordination

Honors and Awards
Young Investigator Excellence Award, Robotics Society of Japan in 2001
Best Paper in Robotics Award of ROBIO in 2004
JSME Award for best paper, Japan Society of Mechanical Engineers in 2005
Best Paper Award, Robotics Society of Japan in 2005
Original Paper Award, FANUC FA and Robot Foundation in 2006
Young Scientists’ Prize, The Commendation for Science and Technology, Minister of Education, Culture, Sports, Science and Technology in 2014
“Cameras and Image Sensors”

Abstract
In order to investigate and develop advanced technologies for robot vision, image-based control and vision-based intelligent systems, it is important to understand how cameras acquire images, and how obtained images are affected by sensor structures and dynamic aspects of sensor operations. This lecture describes the principles, structures and operations of CCD/CMOS image sensors and camera systems. It also mentions related advanced topics such as high-speed imaging and exposure control as well as their applications.

Research Interests
(1) High-speed vision systems and real-time vision processing
(2) Vision application in robotics and human interfaces
(3) Real-time sensory information processing

Honors and Awards
2011 Research Incentive Award, M. Ishida Foundation
2010 Frontier Paper Award, Meeting on Image Recognition and Understanding
2009 Best Conference Paper Award, IEEE International Conference on Mechatronics and Automation
2004 Young Investigator Excellence Award, Robotics Society of Japan
2000 Incentive Award, IEEE Solid-State Circuits Society Japan Chapter
“Haptic Interfaces”

Abstract
Haptics is all things related to our sense of touch. Creating haptic feedback for human interfaces contributes to enhancing our communication and physical capabilities. In this lecture, the recent topics and the state-of-art on haptic interfaces are introduced, especially from the aspect of cutaneous sensations. Advanced vibration feedback technologies, which produce force-like sensations, such as friction, inertia, and viscosity sensations for mobile information devices and motion support system are also introduced.

Research Interests
Haptics, Tactile Display, Tactile Sensor, New Actuators, Virtual Reality

Honors and Awards
Best Paper Award, Journal of Robotics and Mechatronics, 2010
Best Paper Award, Transaction of Virtual Reality Society of Japan, 2002 and 2007
Best Poster Award of IEEE World Haptics Conference 2007 and 2013
Best Hands on Demo Award at the EuroHaptics 2008
Best Demo Award of IEEE Haptics Symposium 2014
Kazuhiro KOSUGE, Professor, Graduate School of Engineering

“Robotics as Systems Integration, an Overview I, II”

Abstract
First, two issues for robot systems integration are discussed. One is related to how to integrated devices and unit technologies into robot systems and the other is related to how the robotic systems are integrated into society. Both issues are very important for bringing the robotics into the real world. Then, the systems integration issues are discussed using examples of robots and RT systems having physical interactions with humans which include robot helpers, passive robotic systems, and walking helpers. The dance partner robot, PBDR, is also discussed as a research platform for the future robot and RT systems for quality of life.

Research Interests
Robotics
New Robots Design
Intelligent Systems Design
Control Engineering

Honors and Awards
Director & Delegate, Division X, IEEE (2015-2016)
Member, Board of Directors, IEEE (2015-2016)
President, IEEE Robotics and Automation Society (2010-2011)
IEEE Fellow
RSJ Fellow
JSME Fellow
SICE Fellow
JSAE Fellow
JSME Awards for the best papers, Japan Society of Mechanical Engineers in 2002 and 2005
RSJ Award for the best papers from the Robotics Society of Japan in 2005
Original Paper Award, FANUC FA and Robot Foundation in 2004 and 2006
Best Paper Award of IROS’97
“Molecular Robotics I, II”

Abstract
The concept of nanometer scale mechanical systems first appeared in the famous lecture “There is plenty of room at the bottom” by Feynman (1959). Inspired by this idea, Drexler claimed that it is possible to build innovative artificial molecular machines such as gears and bearings by using a universal assembler that assembles atoms. Although his idea was met with much skepticism, it led to the establishment of a research field called molecular nanotechnology. In this lecture, DNA nanotechnology which is one of those emerging molecular nanotechnologies will be depicted. By the DNA nanotechnology, it becomes possible to make various mechanical and/or information processing devices out of DNA molecules. Accordingly, current efforts focus on creation of nanoscale molecular robots. Some topics on the frontline research will be reported.

Research Interests
(1) DNA Nanoengineering and its application to create Molecular Robots
(2) Distributed Autonomous Systems
(3) Sciences on Form

Honors and Awards
1992 IEEE Industrial Electronics Society, Outstanding Transaction Paper Award
1996 Outstanding Paper Award J.SICE 1996
2004 ROBOMEC Award, JSME
2007 Good Design Award, METI, Development of M-TRAN III (as a chief designer)
“Field Robotics”

Abstract
Field robots are expected to work in irregular outdoor terrains and hostile environments, instead of human. Therefore, the field robotics research includes the following topics: high-performance mobility, environment mapping and localization, path planning and navigation, and supervisory teleoperation. In the lecture of “Field Robotics”, some technical issues relating to the field robotics will be introduced, and mobility mechanism topics will be discussed in detail.

Research Interests
(1) Locomotion mechanism
(2) Teleoperation
(3) Mapping and path planning for mobile robots on rough terrain
(4) Autonomous navigation

Honors and Awards


“Computer Vision I, II”

Abstract
It is said that more than eighty percent of sensory information humans receive is through vision. Computer vision is a research area that studies how to make a computer perform the high-level visual information processing that humans do. Its application covers a wide range including robot vision, video/film production, medical applications, computational photography etc. This lecture describes two key problems in computer vision, 3D reconstruction from multi-view images and visual object recognition, from their theoretical bases to practical applications.

Research Interests
(1) Statistical methods and optimization in computer vision
(2) Multi-view geometry and its applications, e.g., large-scale city modeling
(3) Image-based recognition of objects, materials, and others that humans can visually recognize.
“Disaster Robotics”

Abstract
The Great Eastern Japan Earthquake was the first disaster where many robotic systems were used for disaster response and recovery. It is predicted that robotic systems become essential solutions in the near future. In this lecture, special topics related to rescue robots and systems will be introduced.

Research Interests
Rescue robotics, Actuators, Virtual Reality

Honors and Awards
President, IEEE Robotics and Automation Society 2016-2017
President, International Rescue System Institute
Program Manager, Japan Cabinet Office ImPACT Tough Robotics Challenge Program
IEEE Fellow, JSME Fellow, RSJ Fellow, SICE Fellow
RSJ Best Achievement Award
JSME RMD Best Achievement Award
SICE SI Best Achievement Award
RSJ Social Contribution Award
METI Robot of This Year
FDMA Commissioner Award
Abstract
Space robots have two distinct application fields: One is orbits around the earth. Manipulator arms mounted on Space Shuttle or International Space Station are in this category and dynamics and control in free-floating environment are of interest. The other is the surface of the moon or planets. Locomotion and remote/autonomous navigation are of interest. After a general introduction of current achievements in space robotics, specific focuses are placed on Hayabusa, a Japanese asteroid probe and the sensing and navigation of a wheeled mobile robot (rover) for lunar/planetary exploration.
In the lecture of “Micro-satellites and Micro-rovers,” our current activities on micro-satellites and micro-rovers are introduced. As for the micro-satellites, a university-made “RISING-2” satellite was launched on May 24, 2014 and it is now making top-of-the-world level achievements. As for the micro-rovers, lunar rovers for the GLXP challenge are elaborated.


Research Interests
(1) Dynamics and control of space robotic systems ranging from orbital free-flying robots to planetary exploration rovers
(2) Development of university-based micro-satellites
(3) Terrestrial applications of space technology, such as robotics remote exploration for search and rescue missions.

Honors and Awards
2015 Terrestrial Milestone Prize in Google Lunar XPRIZE (for team HAKUTO)
2014 Commendation for Science and Technology by the Minister of Education, Culture, Sports, Science and Technology, Japan
2008 Best Paper Award in IEEE 2008 International Conference on Mechatronics and Automation
2001 Best Conference Paper Award in IEEE 2001 International Conference on Robotics and Automation
1998-Now Visiting Faculty of International Space University
JSME Fellow, JSASS Fellow, RSJ Fellow
Evaluation

Four (4) ECTS credits should be awarded to the student by his/her home university upon the completion of the required coursework and a successful assessment of a project through an oral presentation and performance demonstration.
Japanese Culture

Tea Ceremony and Kimono Dressing

Week 2, Tue August 2nd, 12:30-16:00
Aoba Memorial Hall 7th floor
(See Map on page26)

Tea Ceremony
Students will have an opportunity to experience a Japanese tea ceremony in an authentic tearoom. The procedures for tea making will be demonstrated by professionals as well as a chance to prepare it by yourself.

Kimono Dressing
Students will also have an opportunity to wear a “Kimono” or “Yukata” with the help of professionals.
The Yukata is a Japanese summer Kimono worn by both men and women. The name Yukata came from the word "yu" (bath) and "katabira" (under clothing). Thousands of years ago, Court Nobles wore linen "yukatabira" which were draped loosely after taking a bath.

The ceremony venue will be situated overlooking the city of Sendai, with a beautiful view of the Pacific Ocean, and the mountains.

※Participants will be separated into groups, and we will inform the list by E-mail and Facebook.
NIKKA WHISKY Distillery
Masataka Taketsuru, known as the father of whisky in Japanese, built the distillery in 1934 in Yoichi that has ideal conditions resembling those found in Scotland. In addition to distillery, a whisky museum exhibiting many interesting materials about the history and production method of whisky and the history of Nikka Whisky, a residence where Taketsuru and his Scottish wife Rita lived and other buildings spread throughout the vast 132,000-squaremeter wide grounds.

Nine historic buildings including a kiln building (the first drying tower) are registered as tangible cultural properties in 2005.

After looking at various facilities, stop at the tasting room to sample whiskey. You can sample two kinds of whisky, etc. for free and rare malt whiskies for a price. In a tea room named Rita House after his wife you can enjoy English-style teatime with tea and scones.

More About NIKKA WHISKY Distillery:
http://www.nikka.com/guide/MIYAGIKYO/about.html
http://www.jnto.go.jp/eng/location/spot/indutour/nikka_whisky_yoichi_distillery.html
Tendo Tower – Traditional painting on shogi pieces

Tendo Tower in Tendo city, which is the largest producer of shogi pieces in Japan. We can experience traditional painting on shogi pieces. You can make your own shogi piece and take home it. Shogi is the traditional chess of Japan. Modern shogi is approximately as old as modern western chess (what we call chess), about 500 years old. The game is probably derived primarily from Chinese chess, xiangqi, but also has interesting similarities to Thai chess, makruk.

Mogami River Boat Ride
Enjoy the Mogami, valley of four seasons in the everlasting stream of time!

The Mogami River, one of Japan's three major rapids, is known as the mother river of Yamagata Prefecture, and the citizens of Yamagata feel a deep affection for it. It runs from North to South through the entire prefecture, and the natural scenery surrounding the river shifts beautifully with the changing seasons. Yamagata is truly blessed to have this river, which is also a vital natural resource. The basin of Mogami River is a leading grain-producing region, having been prosperously irrigated for centuries. The Mogami River was mentioned in Japanese "haiku" poems in Matsuo Basho's famous "The Narrow Road to the Deep North" travel journal, and it remains famous today for boat rides that can be taken down the river. The best way to experience the truly gorgeous Mogami River Valley for yourself is to take a trip on the Mogami River Boat. On this trip, the boatman will sing you a traditional river song, and you will be able to spend approximately an hour taking in all the sights as you make your way down the river.
Accommodation

“Hotel Premium Green Hills”

2-8-11 Chuo, Aoba-ku, Sendai, Miyagi, 980-0021 Japan
Phone: +81-22-722-1501; Fax: +81-22-722-1561
http://www.bh-green.co.jp/hotel/hills/outline.html

Check-in / Check-out, Meals, etc.
Twin rooms are reserved for the participants during the period of TESP.
Check-in : After 3pm
Check-out : Before 11am
Breakfast and dinner are NOT included.
Optional breakfast: 800 yen per meal
*apply at the front desk
Free Wi-Fi in all rooms
Laundry facility with washer and dryer (free)
(Laundry detergent packets are sold at the front desk.)

Access from/to Sendai Station:

10 minutes on foot
The hotel is located North-West of JR Sendai Station. When you arrive at JR Sendai Station by Shinkansen (super-express) from Tokyo or the train from Sendai airport, exit from the West entrance at 2nd floor (http://www.jreast.co.jp/e/stations/e913.html) and walk across the pedestrian bridge.
Access to the Campus

Take the subway (Sendai Subway Tozai Line) from Sendai Station to Aobayama Station (9 mins). Exit at South 1 for the School of Engineering.

Station Entrance:
At the entrance of subway stations, subway symbols and station names are displayed.

Buying Tickets and Taking the Subway
Please buy tickets at the ticket machines. Please insert your ticket into the Automated Ticket Gates. Platform 3 is for “Arai” bound cars and Platform 4 is for “Yagiyama Zoological Park” bound cars. Please be sure to check the platform number and wait behind the white lines. The cars come every 7 or 8 minutes.

iCSCA CARD
iCSCA card is rechargeable IC card that can be used to conveniently pay fares on buses, subways and railways. You can purchase an iCSCA card at subway stations. The initial cost consists of a refundable deposit of 500 yen. Then you choose how much additional money you want to put on the card, from 500 up to 9,500 JPY. The current credit balance is shown on a small display whenever you pass a ticket gate or it can be checked at ticket machines.
Transfer between Campuses

We will have the farewell party on Katahira Campus. You can take the Campus Bus to/from Aobayama Campus. Campus Bus is the free shuttle bus service for Tohoku University students and staffs. Below is the schedule for the campus bus. As for bus stop, see the map on page 26/27.
Restaurant Hagi
Farewell Party: Aug. 5th
Katahira Campus
Bus Stop (Approx.)
Earthquake

What should you do?

First step:

Ensure your own safety
Put on a helmet or cover your head with a cushion and take cover in a safe place such as under a sturdy desk. It is dangerous to dash out of the house.

Second step:

Evacuate to the nearest designated refuge area

Designated refuge areas are facilities with open space for the initial refuge in the event of a disaster. On the Aobayama campus, there are refuge areas at each department. In Sendai, public elementary schools, junior high schools, and high schools are designated as refuge areas. Confirm your nearest refuge area and escape route.

on Campus

in Sendai city

At school: Follow the instructions of faculty members or staff
At the hotel: Follow the instructions of the hotel staff
Health Care

Health Administration Center, Tohoku University

Kawauchi 41, Aobak-ku, Sendai, 980-8576, Japan
Phone: +81-22-795-7836 Fax: +81-795-3804
http://www.health.he.tohoku.ac.jp/?num=70228130607

※Medical treatment is also available from any hospital outside the campus. We introduce some clinics and hospitals on your request. Please bring along your Passport, Cash and a copy of Insurance to the medical facilities. Please carry your insurance policy throughout the program.

Facilities

University Cafeteria & Shops, Internet Access on Aobayama Campus

Cafeteria & Restaurant
Aoba Syokudo
(Main cafeteria, Halal menu offered)
Book+cafe"Boook"
Restaurant “Shikisai”
Komorebi Cafe
KEYAKI DINING-Student Restaurant
Espace commun (Café and Dining)

Computer & Internet Access

5 desktop computers at IEED office are equipped with software including Microsoft 2010, Internet Explorer, Acrobat Reader DC.
* Office hours: 8:30-17:30 Mon.-Fri.
* You are welcome to bring your own laptops, and use on/off-campus.

Campus Wi-Fi Service (Eduroam)

The world-wide roaming service called “Eduroam” is available for internet. If you cannot register at your university, please apply for the account at IEED Office.
Useful Information

Link List
Hospital and Clinics in Sendai
http://www.sira.or.jp/japanese/info/img/H&C200905.pdf

Ministry of Foreign Affairs
http://www.mofa.go.jp/index.html

Sendai International Relations Association
http://www.sira.or.jp/english/index.html

Sendai City
http://www.city.sendai.jp/index-e.html

Miyagi Prefecture

Sendai Traveling Information
http://www.sentabi.jp/1000/10000000.html

Miyagi Touring Navigation

Tohoku University
http://www.tohoku.ac.jp/english/

School of Engineering, Tohoku University
http://www.eng.tohoku.ac.jp/english/

Division of International Education and Exchange, School of Engineering
Tohoku University
http://www.ied.eng.tohoku.ac.jp
Contacts & Information

Narita Airport
Phone: 0476-34-8000 (General Information Desk)

Sendai Airport
Phone: 022-382-0080 (General Information Desk)
URL: http://www.sdj-airport.com/english/index.html

JR Sendai Station
Phone: 022-223-3313

Tourist Information Center in JR Sendai Station
Phone: 022-222-4069 (Open 8:30-20:00)

Bus & Tube in Sendai (Transportation Bureau City of Sendai)
Phone: 022-222-2256
(Open: Mon-Fri 8:30-18:30, Sat/Sun/national holidays 8:30-17:00)

Hotel Premium Green Hills
Phone: 022-722-1501
2-8-11 Chuo, Aoba-ku, Sendai, Miyagi
http://www.bh-green.co.jp/hotel/hills/

In case of Emergency:
Police: 110
Ambulance and Fire Engine: 119

Division of International Education & Exchange (IEED)
School of Engineering, Tohoku University
Phone: 022-795-7996
6-6-04 Aramaki Aza Aoba, Aoba-ku, Sendai, Miyagi, 980-8579, Japan
E-mail: ieed-eng@grp.tohoku.ac.jp
URL: http://www.ied.eng.tohoku.ac.jp