

# Top Global University Project (Type B) Nagaoka University of Technology

## 1. Outline

### 【 Name of project 】

**The Education Program for Innovative Global Engineers**

~Toward development of an integrated global campus with collaboration between industry, academia, and government~

### 【 Future vision of the university planned in TGU project 】

**The university leading the Innovative Global Engineering Education with a strong network among world-leading strategic regions in the next-generation.**

### 【 Summary of Project 】

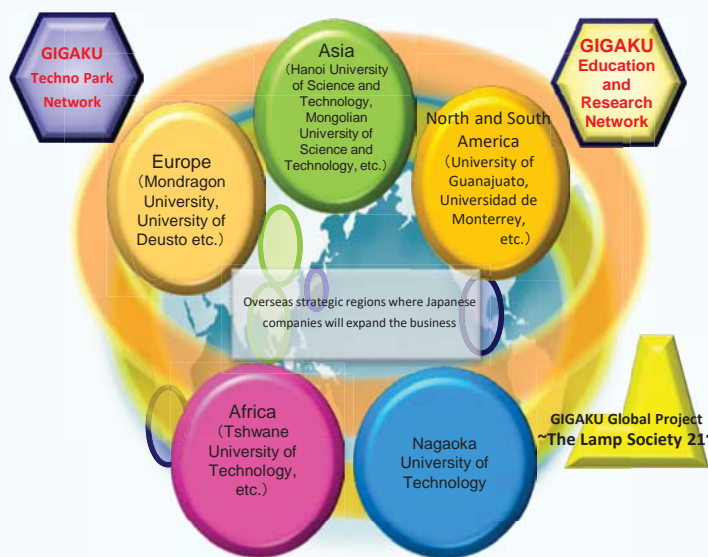
This project is intended to realize “the university leading the Innovative Global Engineering Education with a strong network among world-leading strategic regions in the next-generation” as the status of Nagaoka University of Technology (NUT) in ten years through the following projects that will be its pillars, looking hard at the future vision of globalization for the Japanese economy.

1. Promoting KOSEN-University of Technology (GIGAKU) Education and Research Model at the next-generation strategic regions and establishing **GIGAKU Education and Research Network**.
2. Promoting Industry-Academia Cooperation Model at overseas strategic regions and establishing **GIGAKU Techno Park Network**.
3. Promoting the world-class level research at the technology field that meets the needs of global society.

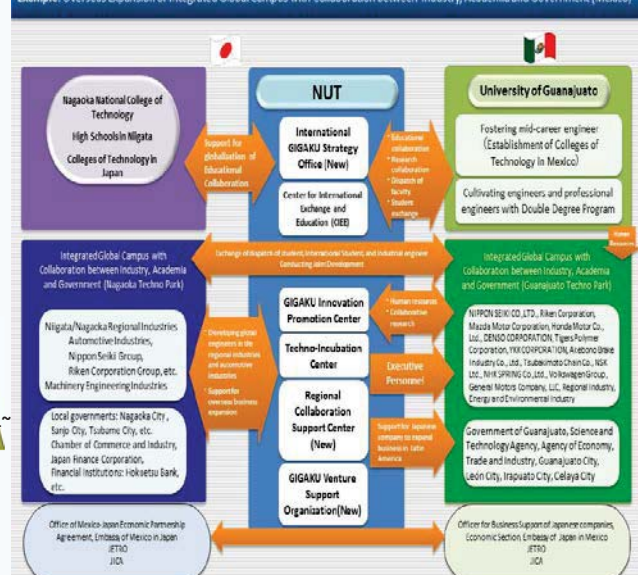
The keyword here is **GIGAKU = science of technology, which has remained the fundamental philosophy of NUT since its foundation** and which has started to attract attention from overseas partners again during the course of NUT expansion in global activities. The idea aims to realize a GIGAKU Education Model, which is attracting global attention, at base universities in strategic regions, particularly for Japan. **The global education environment created in this way is simultaneously indispensable for Japanese students to develop as creative engineers who play active roles in the era of new globalization. The ultimate goal of the idea lies also in this point.**  
( Outline Figure etc.)

## Integrated Global Campus with Collaboration between Industry, Academia, and Government

「 GIGAKU Education and Research Network 」 + 「 GIGAKU Techno Park Network 」  
= 「 Integrated global campus with collaboration between industry, academia, and government 」



Example: Overseas Expansion of Integrated Global Campus with Collaboration between Industry, Academia and Government (Mexico)



## 【Summary of the 10-year plan】

### ○ Program for **cultivating practical global engineers**

To develop science and technology education and research programs for cultivating practical engineers worldwide, we are implementing a range of collaboration programs for undergraduate students to doctoral course at overseas base schools to promote the improvement and expansion of settings with companies.

### ○ Support for **spreading education of science and technology in overseas base school**

To collaborate with universities in strategic areas throughout the world and to spread education based on science and technology, we aim to support program inception and instruction of training methods. We also aim to establish extension campuses overseas in the future.

### ○ **Integrated global campus developing with GIGAKU techno park network**

We aim to construct an Integrated global campus at each strategic area by combining industry-university-government cooperation projects and science and technology practical education through Techno-parks that have been developed globally. Especially, we intend to develop international joint research, put research seeds into effect, apply the results to product development, and promote multiple dispatch of students of universities, technical colleges and high schools, SME engineers, and faculties.

### ○ **Industry-academia collaboration research projects in each strategies country**

With our ability to develop industry-university research, we investigate national and international companies' needs and technological innovation to realize industrial innovation through global application research, we construct and operate a new system for cultivating global engineers as valuable human resources.

### ○ **Promoting interactive student and faculty exchange**

Students and faculty members in NUT experience innovation with global enterprises utilizing global integrated campus of industry-university-government in an overseas base. This type of education fosters engineering with a certain general foundation for expertise and high power of execution for solving problems by introducing practical training methods into long-term education for 15-year-old high school students to the masters (or doctoral) level.

## 【Featured initiatives (Internationalization, University reform, Education reform)】

### ○ **Forty percent of students will experience innovation abroad by the time they complete the master's program**

Utilizing the recipients for overseas internship that NUT has cultivated and the GIGAKU Techno Park, we enable students to experience innovation abroad at each phase of college of technology, or KOSEN, faculty (internship), and graduate school (research exchange).

### ○ **The ratio of international students is to be increased to 25% by the transfer of the KOSEN model and the twinning program**

NUT supports overseas transfer of the KOSEN-style education model, which has drawn global attention, and secures international students from various backgrounds.

With the implementation of these efforts, students of NUT and GIGAKU Education Network will be provided a new learning opportunity through GIGAKU Techno Park Network. Moreover, the **Overseas Cross (Interactive) Internship** will be realized.

NUT established the **International Graduate Course for Continuing Professional Development** in 1994 and began accepting engineers who work for Japanese-affiliated and other companies to the master's program. The program is still the only **program in Japan as an engineering education course that targets working adults and which provides all lectures and research guidance in English**. In addition, NUT has made achievements such as having **dispatched 600 students to a total of 20 countries for a long period of six months as interns since 1990**. We have implemented widely diverse programs, always reviewing the future vision of globalization.

This project is to develop NUT's consistent philosophy and assets in educational programs while adding new elements, thereby responding quickly to new stages of globalization.

## 2. FY2014 Progress

### ■ Common indicators and targets

#### Internationalization

##### ○ The Five-year Integrated Doctoral Program “Department of Science of Technology Innovation” has been established.

All lectures in this major are presented in English. NUT develops world-class personnel using the system, which enables students to study abroad for more than six months, and the double degree system, which enables them to earn a doctoral degree concurrently at an overseas university. In 2015, nine members of the inaugural class are enrolled and are aiming to become excellent leaders for industries in Japan and the world.

##### ○ Clerical staff members are also making efforts for globalization.

NUT implemented training to develop English language ability for clerical staff. The improvement of language proficiency among clerical staff is necessary to address international students and clerical work with universities with which an academic exchange agreement was signed. We continue to implement practical training with actual business operations in mind.

##### ○ NUT is improving the provision of information to overseas countries and the environment in which international students can easily study and undertake research.

NUT renewed its English site to enhance its contents and provide substantially equivalent information to that of its Japanese site. In addition, English has been added to the menus in the student cafeterias, making it easier for international students and teachers to place orders. We began offering halal and vegetarian meals; the environment has become more comfortable for students from diverse cultural and religious backgrounds.

#### University reform

##### ○ Systems at NUT were improved to realize an “Integrated Global Campus with Collaboration between Industry, Academia, and Government.”

NUT reorganized the teacher organization that had been composed of nine “departments” into two teacher organizations as “research institutes” in April 2015. The reorganization activates research by combining different fields more actively. Furthermore, toward overseas expansion of GIGAKU education, we improved the systems of personnel and facilities that are intended to be the basis by establishing subcommittees on International GIGAKU Education Promotion, International Education and Research Network, International Techno Park Network, International Regional Collaboration Promotion, and Internationalization on Campus.

##### ○ For the improvement of education at NUT, various hiring methods were implemented to produce excellent teachers in various fields.

###### [Annual Salary System]

To hire internationally excellent researchers actively, NUT appointed eight teachers under the annual salary system.

###### [Cross Appointment System]

To secure practical human resources in industries, we have newly employed two teachers in March 2015 using the cross-appointment system.

#### Education reform

##### ○ To support international students, syllabus-related documents were translated into English.

To provide syllabus-related information equally for international students who have difficulty understanding Japanese language, the 2014 and 2015 syllabus presentations were translated into English. In addition, course registration guides and class timetables were posted on the English site. NUT is promoting support for international students by transforming the education system to a bilingual system.

##### ○ Instructional software was introduced to enhance English language ability among students.

NUT has introduced instructional software to enhance English language proficiency among NUT students. We continue to foster practical, global human resources through further enhancement of the students’ ability to promote overseas practical training and internships actively. In 2014, 58 students participated in overseas internships.

##### ○ Each education system is being improved.

To check the rules of subject numbering, to improve class contents and methods, and to examine the substantiation of credits, we have decided to introduce a class questionnaire system and have improved the environment.

Furthermore, to systematize the curriculum and construct an academic affairs system that secures the international interchangeability of credits based on international collaboration between KOSEN and universities of technology, we have conducted translation of the model core curriculum into English and have prepared to ensure the continuity of GIGAKU education with KOSEN established at overseas countries.



〈 The First GIGAKU Techno Park Alliance Meeting 〉

## ■ University's own indicators and targets

### ○ **Teacher diversity and mobility are being promoted through exchanges between the bases at home and abroad.**

Through GIGAKU Education and Research Network, NUT has been actively promoting the acceptance of young teachers from partner universities into our International Graduate Course for Continuing Professional Development and other courses. The number of partner university teachers who earned a degree at NUT has increased to **180** from about 150 at the end of 2013.

### ○ **NUT supports and develops international joint research involving local small and middle-sized enterprises.**

In Mexico, NUT has received applications for industry–academia joint research from **two local firms**. NUT is starting to devote specific consideration to them.

### ○ **NUT is conducting investigation and coordination to expand GIGAKU education to each base country. [Mongolia]**

Toward starting of the twinning program with Mongolian University of Science and Technology, NUT is carrying out coordination to improve the curriculum at Mongolian University of Science and Technology. In addition to dispatching teachers in charge to the site to investigate the conditions of coordination of the curriculum, implementation of lectures, and maintenance of laboratory equipment, we invite partner university teachers to visit laboratories and exchange opinions and to provide information that is expected to be useful for education and the enhancement of equipment in Mongolia. We have been striving to strengthen our mutual collaboration.

#### **[Vietnam]**

For the curriculum of **Vietnam Japan International Institute for Science of Technology (VJIIST)**, as established in Hanoi University of Science and Technology, to be equivalent to GIGAKU education at NUT, we dispatched and accepted teachers to coordinate the curriculum and other matters.

#### **[Sri Lanka]**

We **met face-to face with Sri Lankan President Mr. Ranil Wickremesinghe** and obtained his approval for the spread of GIGAKU education in Sri Lanka and an idea for the establishment of a new university to foster practical engineers based on GIGAKU.

## ■ Featured initiatives based on the characteristics of the university

### ○ **Super GI-net, a video conferencing system connectable to multi points in overseas bases, was installed.**

NUT installed Super GI-net, a video conferencing system that can support lectures and meetings by connecting multiple locations, at **University of Guanajuato (three campuses), Universidad de Monterrey, Hanoi University of Science and Technology, and Mongolian University of Science and Technology**.

In May 2015, the first Super GI-net Conference was held with participation from the four bases of UG, HUST, MUST, and NUT. An official from the Ministry of Industry and Trade of Mongolia explained the industrial circumstances in Mongolia at the conference, where we were able to share information among bases.

### ○ **GIGAKU Techno Park Office have been opened in three bases.**

NUT has opened offices in **Guanajuato Techno Park, Mongolian University of Science and Technology, and Hanoi University of Science and Technology** as overseas bases (GIGAKU Techno Park). In addition to inviting local people involved to the opening ceremony for each office to strengthen collaboration, we hired coordinators to start industry–academia activities. We were able to form the bases to construct a system to strengthen collaboration with NUT.

### ○ **GIGAKU Techno Park Alliance Meeting was held.**

**“The First GIGAKU Techno Park Alliance Meeting”** was held in Nagaoka City on March 23 and 24. We invited 21 working-level personnel from six countries to convene a study meeting and an exchange of opinions related to the Techno Park. In that successful meeting, **a total of 45 people** participated, including those involved in business enterprises. Lively discussions were held with the goal of constructing a future “GIGAKU Techno Park Network.”

## ■ Free description

### ○ **GIGAKU Global Network Promotion Office, which is intended to be a base for the dissemination of information in and out of NUT, was established.**

We established **GIGAKU Global Network Promotion Office**, which is to be a base for the dissemination of information mainly on Top Global University Project in and out of NUT. The office will be used for the dissemination of results as well as the holding of meetings with people of overseas base universities and promotes the globalization of NUT.

### ○ **NUT is holding consultations with base countries to promote overseas assignment of Japanese students and the acceptance of international students.**

In 2014, we improved the basis for promotion of overseas dispatching of Japanese students and for the acceptance of international students by encouraging companies to accept new interns in Thailand and Indonesia and to hold positive consultations related to the double degree program with universities in Malaysia and Thailand.

### 3. FY2015 Progress

#### ■ Common indicators and targets

##### Internationalization

###### ○ Environment Created to Deal with International Students, Foreign Teachers, and Visitors from Overseas Universities and Institutions

Many of the signs posted in NUT have been written in both Japanese and English.

In addition, English training was provided for 14 clerical staff members twice a week. Overseas SD training was provided for four people.

[ **Number of clerical staff members who meet the standards for foreign languages (as of the end of March, 2016)** ] Number of full-time staff: 21. Number of part-time staff: 8

###### ○ Foundation of Short-term Acceptance Program for International Students Promoted by Establishment of International Cooperation Associate

International Cooperation Associate considered programs to accept international students and supported the conclusion of academic cooperation agreements to address the increasing number of international students.

###### **Nagaoka Summer School for Young Engineers (NASSYE)**

has been planned as a short-term study abroad program for overseas university students. It will accept 20 students in the summer of 2016.



##### University reform

###### ○ Internationalization of Teachers Promoted through International Public Offerings of Teachers and Enhancement of Sabbatical Training System

As a result of an international public recruitment of teachers via the English version of our university's home page, a foreign teacher has been employed in the Department of Materials Science and Technology. In addition, the sabbatical training system was enhanced and a young female teacher has been dispatched to Germany for about a year. Every time a debriefing session is conducted by a person who experienced the sabbatical training, it attracts numerous teachers and other staff.

As described above, the internationalization of teachers is being promoted by improving the methods of public offering to secure excellent foreign teachers and by actively dispatching young Japanese teachers abroad.

###### ○ Institutional Research (IR) Promotion Office Established to Enhance Function of IR

With the change of the administration, we have added a vice president in charge of institutional research, evaluation, and public relations and a presidential aide in charge of IR and evaluation. In April 2016, the IR Promotion Office was established.

Enhancement of IR functions will help gather and analyze various information within and outside the university and use it for further enrichment of global strategies and education.

##### Education reform

###### ○ Subject Numbering System to be Introduced in 2016

The system helps students to choose and take appropriate subjects according to the levels and specialized characteristics of the subjects. In the future, it might be used for tasks such as the comparison of class levels with those of other universities and technical colleges and work for comparison of curricula.

#### ■ University's own indicators and targets

###### ○ Overseas Internship and Overseas Cross Internship Systems Expanded

The **English version of "Guidance for Internships"** was made to visit overseas companies accepting internships, etc. We are promoting the cultivation of new recipient companies.

In addition, the dispatch of overseas internship students to the Basque Country, Spain and the acceptance of international students from Mondragon University in the Basque Country started in 2015.

Overseas cross internships are also being expanded to various countries.

For example, students of both universities undergo corporate training in the country to which the students were dispatched.

In 2015, overseas cross internships were implemented with universities in India, Malaysia, and Spain.



〈English version of "Guidance for Internships"〉

## ○ GIGAKU Techno Park provides continuous support for globalization of SMEs

**[Vietnam]** A workshop held jointly with Hanoi University of Science and Technology attracted more than 100 participants from universities and companies.

**[Thailand]** A joint symposium was held with Chulalongkorn University (4<sup>th</sup> Joint Symposium CU-NUT&CU-NUT GIGAKU Techno Park Office), in which 80 people from universities and companies participated.

**[Mexico]** Researchers of University of Guanajuato visited a Querétaro factory of a Japanese-affiliated, SME via the GIGAKU Techno Park of NUT and exchanged opinions on future joint research.

We invited participating companies to an innovation forum held in Guanajuato State.

As described above, we continue to promote the international expansion of SMEs using the GIGAKU Techno Park.

## ■ Featured initiatives based on the characteristics of the university

### ○ Twinning Program with Mongolian University of Science and Technology Starts

To develop human resources in engineering to meet requests of the industrial community in Mongolia, a Twinning Program with Mongolian University of Science and Technology started. At the start, we gave the training for teachers and staff invited from the Mongolia side, in addition to adjusting the curriculum, as the secretariat school of the Japanese University Consortium universities (Kitami Institute of Technology, Nagoya Institute of Technology, Toyohashi University of Technology, Kyoto Institute of Technology, Kyushu University, and NUT).

In September 2015, **the Opening Ceremony of Twinning Program in Mongolia** was held with many people present, including the Minister for Education, Culture and Science of Mongolia (a graduate of NUT), Japanese ambassador plenipotentiary to Mongolia, and attendees from universities and technical colleges. The first half of education for the first graduates students started.

### ○ Two New GIGAKU Techno Park Offices Established

As overseas bases (GIGAKU Techno Park), a joint office was newly established in **Chulalongkorn University in the city of Bangkok, Thailand and Universiti Sains Malaysia in Penang Island, Malaysia**, respectively. A coordinator is stationed in each office to promote cooperation with Japanese-affiliated companies. The offices are the fourth and fifth offices, following those of Mongolia, Vietnam, and Mexico.



〈 GIGAKU Techno Park Office in Thailand 〉

## ■ Free description

### ○ Fourth International GIGAKU Conference in Nagaoka Held

To disseminate the spirit of “GIGAKU” throughout the world, NUT has held the **International GIGAKU Conference** every year since 2011. The year of 2015 marked its fourth anniversary, in which a total of about 520 teachers, staff, researchers, and students, including 56 attendees from 13 foreign countries participated.

At the conference, our distinctive “KOSEN–University of Technology Education System” (GIGAKU education) was explained and opinions were exchanged on widely various areas, such as matters related to international joint research. The fifth conference will be held in October 2016.

### ○ Support for Education and Research Using Video Conferencing System Provided

A video conferencing system (Super GI-net) introduced at overseas bases is being used for education and research at NUT and base schools.

**[Super GI-net Conference Held between Japan, Mexico, Vietnam, and Mongolia]** Teaching staff of the bases and coordinators of the Techno Park offices exchanged opinions on the actual conditions and situations of each country in terms of industry–academia cooperation and international cooperative education, and shared the problems to be solved.

In addition, coordinators of the Techno Park offices exchange information on a regular basis using the Super GI-net.

### **[Seminars between Mongolian Office and NUT Laboratory Start]**

Laboratory of Civil and Environmental Engineering at NUT and the laboratory at Mongolian University of Science and Technology hold seminars once a week using the Super GI-net.

### **[Debriefing Session by Internship Students Dispatched to Mexico Held]**

Using the Super GI-net established at the University of Guanajuato, Mexico, a debriefing session was held with our students on overseas internship.



〈 4<sup>th</sup> International GIGAKU Conference in Nagaoka 〉

## 4. FY2016 Progress

### ■ Common indicators and targets

#### Internationalization

##### ○ Promoting Expansion of Programs for Accepting International Students

NUT has been implemented **Nagaoka Summer School for Young Engineers (NASSYE)** since fiscal 2016 and also implemented Summer Training and Summer Intensive Program for Twinning Program (TP), and 63 international students were accepted for Program for Short-term Studying Abroad. In order to promote the students exchange with partner university and cultivating global-minded students, we consider adding the content of “Collaborative work with NUT students” and “Experiencing traditional Japanese culture” to the education program next fiscal year and will continue to enhance these programs.



〈 Scene for the accepting students of NASSYE 〉

##### ○ Strengthening for the System to Increase Student Exchange (acceptance / dispatch)

To improve the system for accepting international students and dispatching Japanese students, and to increase the number of that students, Director of language center joined Center for International Exchange and Education as a staff and has responsibility for Program for Short-term Accepting International Students. Also we proceed the preparations for the Jitsumu-Kunren (internship) and interactive Jitsumu-Kunren.

In this results, ratio of the accepting international students (6%) based on the agreements of academic and educational collaboration is far higher that estimated values and ratio of the dispatching Japanese students is steadily increasing compare to the time its start-up.

#### University Reform

##### ○ Translation of University Rules, Documents and On-Campus Guide Plates etc. Promoted

Main University Rules (77 rules), documents (53 forms and manuals) and on-campus guide plates (64 places) have been translated into English or written in both Japanese and English. This enables international students and staff to understand procedures better, and university staff to explain necessary procedures more effectively.

By promoting internationalization, university is promoting service improvement and system development for accepting international students and staff.



〈 Guide plates are written in both Japanese and English 〉

##### ○ International GIGAKU Cooperative Education and Research Program Established

A staff sent from local bank has been accepted in Office of International GIGAKU Cooperative Education and Research Promotion and International GIGAKU Cooperative Education program has been established to acquire funds for construction of Integrated Global Campus. Staffs from local government are expected to be seconded in FY 2017, and cooperation with other institutes will be still more promoted.

#### Education Reform

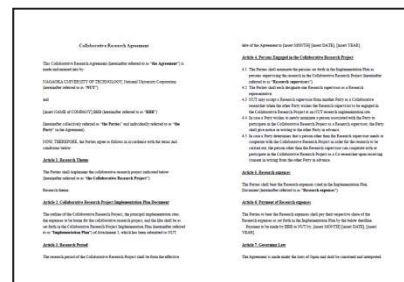
##### ○ Educational Support System by Bilingualization

Subject Numbering system has been introduced to help students choosing appropriate subjects. Other materials such as syllabus, program guide and guidebook for campus life are also translated into English; University provides campus life information and precise curricula information towards prospective international students.

### ■ University's own indicators and targets

##### ○ Institutionalization of International Collaborative Research

Joint research system has formulated to promote International collaborative research with enterprises. The definition of International collaborative research has added in rules for handling of joint research in FY 2016 and its indirect expenses has set up as 30%. In addition, the contract form of collaborative research has modified and 8 cases of international collaborative research has implemented until FY 2016. These collaborative researches has conducted through utilizing the network of GIGAKU Techno Park and this strong connection assists SMEs to expand overseas.



〈 contract form of collaborative research 〉

##### ○ GIGAKU Techno Park Provides Continuous Support for Globalization of SMEs

###### 【Vietnam】

- International collaborative research has implemented between NUT, HUST, Japanese companies and local subsidiary. In addition, we encouraged students from HUST and NUT to take part in these projects and promoted cultivation of practical engineers who have global perspectives.

### 【Thailand】

•We not only supported SMEs in the prefecture to apply for ODA, also assisted these companies to enter overseas markets through the association of local coordinator who NUT hires.

### 【Mexico】

•We provide an exhibition support for three Japanese companies in the prefecture and two Japanese companies outside the prefecture to take part in FISINNCO 2017 held in Leon city in December.  
As above examples, we continue to support overseas expansion of SMEs.

## ■ Featured initiatives based on the characteristics of the university

### ○ Promoting Industry-Academia Collaborative Activities through GIGAKU Techno Park

International collaborative research has implemented between NUT, partner universities, Japanese companies and local subsidiary as the industry-academia collaborative activities through GIGAKU Techno Park. In this model case, these researches encourage students from NUT and partner universities to take part in collaborative researches such as sending Japanese students to local subsidiary, students from partner universities to Japanese companies respectively. It can be expected to cultivate practical engineers in both countries. We continue to promote industry-academia collaboration to cultivate globally practical engineers.



〈At Japanese local subsidiary〉

### ○ Supporting Overseas Expansion of SMEs

GIGAKU Techno Park network which established in overseas strategic regions is utilized to support SMEs companies that are already expanding overseas development or have intention to expand their business abroad. For instance, preliminary consultation has arranged to consider companies possibility of their overseas business expansion, and also supported companies to apply for ODA so far as our activities.

## ■ Free description

### ○ 1<sup>st</sup> Panel Discussion on the Future of GIGAKU Education Held

We called our university's partners that promoting distinctive **practical engineering education**, such as related universities and industries in the world and we held the 1<sup>st</sup> Panel Discussion on the Future of GIGAKU Education (22 participants from 7 countries, 12 institutes). We discussed about the methods of best practice and evaluation of the achievement for practical engineering education that meets the world demands, and possible solution for reinforcing international cooperation. Throughout this meeting, we surveyed indicator of education for practical engineers. This panel discussion was a preliminary meeting for the **International GIGAKU Education Authenticate Committee**. We are planning to hold 2<sup>nd</sup> panel discussion on October, 2017.



〈 1<sup>st</sup> Panel Discussion on the Future of GIGAKU Education〉

### ○ Utilizing Video Conferencing System for Coordinator Meeting

GIGAKU Techno Park office's coordinators exchange the information on a monthly basis using the video conference system (Super GI-net) which installed each strategic office.

Each office's coordinator explain and exchange their opinion about GTP office's progress such as international joint education and joint research project. We approach this future task from different angles and promote education for students and SME's engineers.

On October 2017, we are planning to hold 2<sup>nd</sup> GIGAKU Alliance Meeting. We will further develop the GIGAKU Techno Park Network by enhancing the linkage among strategic regions.



〈9th Web Coordinator meeting〉

### ○ Seeking the Possibility of Establishing New Offices to the Strategic Regions

For the purpose of promoting education and research based on the GIGAKU and industry-academia joint research, we are seeking the possibility of establishing new offices following existing office (Mexico, Mongolia, Viet Nam, Thailand, and Malaysia) for supporting the International Cooperative Education (GIGAKU Education and Research Network) and International Industry-Academia-Government Collaboration (GIGAKU Techno Park Network)

**【India】**Director of Indian Institute of Information Technology, Design and Manufacturing (IIITDM), Kancheepuram shows the approval of establishing new office in IIITDM. This office will be supported for IIITDM-NUT-Industry joint research and expanding our education program for future aspects.

**【Spain】**We are progressing with the preparations for establishing new office at research center in Basque (Spain) on April 2017. This new office will be the window of Europe and will be enhanced the liaison among BC3, MU, DU, and UPV/EHU.



## 5. FY2017 Progress

### ■ Common indicators and targets

#### Internationalization

##### ○ Short-term study programs for international students have been expanded.

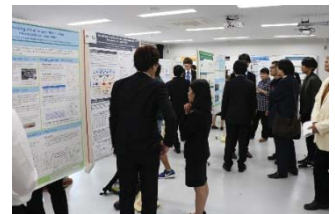
The programs such as Nagaoka Summer School for Young Engineers (NASSYE), Twinning Program Summer Intensive Program (Vietnam & China, Mexico), Japan-Asia Youth Exchange Program in Science (SAKURA Science), and other short-term study programs have been implemented since FY2016. Through these programs, we have accepted 85 international students at NUT. The ratio of international students studying in NUT for the whole year increased by 21.8% in FY2017 compared to 17.7% in FY2016.

##### ○ Overseas internship program has been expanded.

In FY2016, 59 undergraduate students were dispatched to 34 institutions in 14 countries to expand overseas internship program. In FY2017, 66 undergraduate students were dispatched to 37 institutions in 14 countries for a period of four to six months. In addition, we have expanded our student dispatch programs such as Global Leader Research Internship and Short-Term Overseas Training Program for Global Leadership. Moreover, the internship program for special auditing students from universities that have concluded academic exchange agreements was done in Japanese companies, and expanded from 8 students in FY2016 to 21 students in FY2017.

##### ○ The 6th International GIGAKU Conference in Nagaoka (IGCN2017) was held.

The 6th International GIGAKU Conference in Nagaoka (IGCN), which began in FY2011, was held on October 5 and 6, 2017, at NUT, with the purpose of disseminating the spirit of "GIGAKU" worldwide. This fiscal year, a total of 210 participants from universities, National Institute of Technology, and companies in Japan and overseas (15 countries) participated in this conference under the theme of "The Future of GIGAKU Education." The participants had an active discussions about the theme of "GIGAKU Education" and "GIGAKU Research and Development."



〈 IGCN: Poster Session 〉

#### University reform

##### ○ We have promoted the improvement of the language skills of our staff.

In order to improve English proficiency of staff required for dealing with the matters related to international students and universities that have concluded academic exchange agreements, English language proficiency training was conducted for staff. In FY2017, 5 new staff members met the language skills standards stipulated in this project. As a result, the number of staff who achieved this goal increased to 30 staff(20.7%), and the target value(15.8%) for FY2019 was achieved ahead of schedule.

##### ○ Division of General Information was established to unify the information in the university.

We have reorganized our office organization and established Division of General Information in order to unify Institutional Research (IR), office information, and academic information within our university. Strengthening corporate governance is promoted by establishing a system that integrates the information in the university.

##### ○ The establishment of GIGAKU Advisory Board has been promoted.

The establishment of GIGAKU Advisory Board has been promoted to evaluate the activities and management of the entire GIGAKU Education Network and GIGAKU Techno Park Network, which we have built up to now. GIGAKU Advisory Board is planned to establish in FY2018. Managers with extensive experiences of international business, and representatives from overseas collaborative universities invited to the External Evaluation Committee, will mainly be chosen as members for this Advisory Board.

#### Education reform

##### ○ An overseas research internship program for master's degrees has established.

In order to cultivate innovative human resources who can play an active role globally in the future, we have established the Practical Study Project for Master's Student (Research Internship) related to master's research themes at overseas universities, research institutes, and companies for three months or more in master's programs.

From FY2018, we will apply this system to expand the dispatch of master's students.



〈 External evaluation committee 〉

##### ○ We have increased the number of English courses in undergraduate schools.

The number of courses in English were increased from 6 courses in FY2017 to 23 courses in FY2018. In addition, we continued to introduce syllabuses and courses in English to promote bilingualization of our educational system.

■ University's own indicators and targets

○ We established GIGAKU Global Project ~The Lamp Society 21~.

The activities related to the promotion of Industry-Academia collaborative activities purpose at realizing the “Establishment of an Integrated Global Campus with Collaboration between Industry, Academia, and Government”, and the development of practical engineers (students and employed engineers) who will lead the global society, are regarded as GIGAKU Global Project, and in order to be given sustainable support from companies, we are working to strengthen our voluntary financial base by developing a membership system ~The Lamp Society 21~ expanded from original contribution system of GIGAKU Global Project established in FY 2016.

We will continue to promote the development of practical engineers through Industry-Academia collaboration between our university and local companies.



<The Lamp Society 21 pamphlet>

○ The final target for the number of SME international collaborative research projects was achieved ahead of schedule.

The final target (10 cases) for the number of international collaborative research projects with SME was achieved ahead of schedule. Some SMEs are seeking to expand overseas by recruiting foreign human resources based on international collaborative research.

■ Featured initiatives based on the characteristics of the university

○ A new office has established in Basque, Spain.

We opened BC3-NUT office as the sixth office after Mongolia, Mexico, Vietnam, Thailand, and Malaysia, at the Basque Center for Climate Change (BC3), which is located in University of the Basque Country.

BC3-NUT office serves as a contact point for universities in Basque/Spain, such as Mondragon University, University of the Basque Country, and Europe, and provides support for the development of collaborative education programs and the acceptance of interns.



<BC3-NUT office opening ceremony>

○ The third GTP Alliance Meeting was held.

On Thursday, October 5, 2017, the 3rd GTP Alliance Meeting was held in Aore Nagaoka. Approximately 40 participants related to GIGAKU Techno Park (GTP) and NUT offices, which we have set up in its strategic overseas regions gathered together for the meeting. The purpose of this meeting is to discuss the current situation and challenge aheads, and confirm future strategies at nine GTP/NUT offices including the planned offices in 7 countries.



< GTP Alliance Meeting >

■ Free description

○ We participated in the United Nations Academic Impact.



Our university expressed its commitment to support and promote the United Nations' Ten Principles of Academic Impact, and applied for participation in the United Nations Academic Impact and was approved in August 2017.

We will continue to strongly endorse the activities of the United Nations and to take active measures with a strong awareness of the role that institutions of higher education should play in supporting these activities.

○ Hanoi-Niigata Industry-Academia Workshop was held.

Hanoi-Niigata Industry-Academia Workshop was held at Hanoi University of Science and Technology in Vietnam for two days on January 22 (Monday) and 23 (Tuesday), hosted by NUT, International University of Japan, and Japan External Trade Organization (JETRO). The event was also held as a related project to the 45th anniversary of the establishment of diplomatic relations between Japan and Vietnam.

At the workshop, three organizations introduced their respective strengths in supporting the overseas development of companies in Niigata Prefecture, cultivating global human resource capable of playing an active role internationally, and attracting foreign enterprises to Niigata prefecture. A total of 180 participants actively exchanged opinions on building a network with other countries.



< Hanoi-Niigata Industry-Academia Workshop >

## 6. FY2018 Progress

### ■ Common indicators and targets

#### Internationalization

##### ○ Expansion of double degree programs and twining programs

NUT concluded the double degree program agreement for master course with Hanoi University of Science and Technology. Regarding the double degree program for master course with Chulalongkorn University, the agreement was approved from NUT. Therefore, it is hoped that an infrastructure for incoming/outgoing students is upgraded and more students who can be active globally are produced. Also, NUT accepted the first eleven students of twining program from Mongolia.

##### ○ Preparation for a cotutelle PhD program - joint supervision

NUT formed an infrastructure for implementation of a cotutelle PhD program with Indian Institute of Technology, Madras and Universiti Sains Malaysia. This makes possible a degree under supervising by faculty of both universities without financial burdens in a shorter period of time than a double degree program. A diversity of global degree programs under quality assurance is able to be ensured.

##### ○ Achievement of short-term programs for international students

NUT implemented the programs for non-degree students including special audit students and research exchange students, and other short-term programs such as Twinning Program Summer Intensive Program, NASSYE, SAKURA Science, etc. Through these programs, NUT accepted 193 international students as of February 1, 2019 compared to 178 as of February 1, 2018, which means the ratio increased by 8%. Additionally, short-term programs produced good results of international student acquisition. For example, some students who joined NASSYE came back again to NUT as special audit students or passed an entrance exam for full-time student.



〈 NASSYE closing ceremony 〉

#### University reform

##### ○ NUT first GIGAKU Advisory Board

In October, NUT established and held GIGAKU Advisory Board consisting of seven internal members and twelve external members including international business experienced managers (e.g. former president of E. I. du Pont de Nemours and Company, and vice president of Western Digital (Thailand) Co., Ltd.), representatives of overseas collaborative universities (e.g. IITM and HUST, etc.)

We will accelerate the internationalization of university management based on valuable comments of external board members. By reflecting these comments in the project operation, we will further promote the realization of "The university leading the Innovative Global Engineering Education with a strong network among world-leading strategic regions in the next-generation" listed in the project concept.

##### ○ Review of a faculty evaluation system up to international standards

NUT working group examined a faculty evaluation system. To make it international standards, NUT decided to revise "basic policy of faculty evaluation" and "faculty evaluation items". Citation databases, such as Scopus and Web of Science, will be utilized for that. Meanwhile, it is planned that relevant regulations and documents are translated into English.



〈 GIGAKU Advisory Board 〉

#### Education reform

##### ○ The 3rd Panel on GIGAKU Education

This Meeting, equivalent to GIGAKU Education Standards which is implemented under the TGU project, was held to establish network of Global Alliance and discuss engineering program for future practical engineers mainly in core members of Alliance.

At first, President Dr. Azuma delivered opening remark and Alliance core members gave personal and institutional introduction. Following that, NUT presented engineering education program (GIGAKU Education Program) and received comments by participants from 18 institutes in 10 countries. Participants actively contributed to the development of the discussion, and international applicability of engineering education was confirmed.



〈 The 3rd Panel on GIGAKU Education 〉

## ■ University's own indicators and targets

### ○ Support for globalization of regional companies through GTP network

NUT establishes overseas bases "GIGAKU Techno Park (GTP)" in strategic regions with a view to overseas business development of Japanese companies. Through GTP network, NUT provides support for globalization of new 27 regional companies in FY2018. Also, NUT held four international industry-academia activity meetings in Japan and abroad, not just Nagaoka city.

Support for regional companies' globalization is conducive to the improvement of the field for Japanese and international students' global experiences.

### ○ Strengthening the methods for sustainable securing revenues

NUT strives to enhance membership donations by GIGAKU Global Project (The Lamp Society 21) and global joint researches, while contacting and encouraging companies which hope to expand overseas. Specifically, membership donations were new 24 cases/3,963 thousands JPY and global joint researches were new 8 cases/18,843 thousands JPY in FY2018. This effort establishes a necessary financial basis for management of both the TGU project and NUT, and assists sustainable project operations.



〈 international industry-academia activity meetings in Tokyo 〉

## ■ Featured initiatives based on the characteristics of the university

### ○ Two new offices in India and Chile

IITM-NUT Desk was established as new overseas base in Indian Institute of Technology, Madras. India is the third\* most common country which Japanese manufacturers expand in the world. Furthermore, NUT established Chile-NUT Desk and is also in the process of establishing in Ho Chi Minh City, Viet Nam. (\*as of October 1, 2017 "Annual Report of Statistics on Japanese Nationals Overseas" Ministry of Foreign Affairs of Japan)

NUT promotes the expansion of collaborative education program, acceptance of internship, industry-academia collaboration, and collaboration with local companies through all ten overseas desk/office in eight countries.



〈 IITM-NUT Desk 〉

### ○ Utilizing industry-academia collaborations for an educational system

Through GTP network, NUT proceeded an educational system developing global human resources (Vietnam Japan International Institute for Science of Technology (VJIIST)). Specifically, we consider using funds from companies implementing joint research for delivering lectures.

Additionally, "Global Academia-Industry Consortium for Collaborative Education (GAICCE)" was adopted as Collaborative Education Program of JICA ASEAN University Network/Southeast Asia Engineering Education Development Network (AUN/SEED-Net). GAICCE utilizes our GTP project and NUT assisted a facilitator of GAICCE (Chulalongkorn University) in application. The joint project outputs in each GTP create a new partnership model. The sophistication and globalization of this project are improved practically.

## ■ Free description

### ○ UNAI Hub for SDG 9

NUT was appointed to a United Nations Academic Impact (UNAI) Hub for SDG 9 (Industry, Innovation and Infrastructure) by the United Nations as an exemplar of an innovative approach to the Sustainable Development Goals (SDGs). Only one university in the whole world is appointed as a hub for each of the 17 goals of SDGs, and NUT is the only appointment from East Asia including Japan. Recognizing the honor and responsibility elected as the UNAI hub representing university of the whole world, NUT will lead an effort to make a more sustainable world, including a formulation of the foundation for industry, innovation and infrastructure.

### ○ NUT's "GIGAKU SDG Institute" certified as UNESCO Chairs Programme

The "GIGAKU SDG Institute" applied by NUT has been certified as UNESCO Chairs Programme as "UNESCO Chair on Engineering Education for Sustainable Development". It is the ninth certification in Japan and the first certification of School of Engineering in Japan.

Moreover, we are applying this program for UNITWIN Programme with nine partner institutions in six countries sharing basic idea for these education.



〈 UNAI Hub for SDG 9 certification 〉

## 7. FY2019 Progress

### ■ Common indicators and targets

#### Internationalization

##### ○ Expansion of international cooperative education program in graduate school

An agreement of joint supervision of doctoral program has been concluded with the Indian Institute of Technology Madras, and it enabled students to obtain a degree under the supervision of both university faculty members. This ensured the diversity of quality-guaranteed degree programs, and expanded the international cooperative education program in graduate school including the double degree program.



##### ○ Active acceptance of short-term international students

In the intensive summer program of Twinning program, NUT accepted short-term international students as follows.

(1) June 24 (Mon) - July 5 (Fri) (Mexico)

Universidad de Monterrey (5 students), Universidad Autonoma de Nuevo Leon (7 students) < NASSYE closing ceremony >

(2) July 16 (Tue) - July 26 (Fri) (Vietnam/China)

Hanoi University of Science and Technology (10 students), Ho Chi Minh City University of Technology (5 students), Zhengzhou University (10 students).

They had experienced NUT Lab activities, Japanese classes, and Japanese company tours.

Also, NUT held "Nagaoka Summer School for Young Engineers (NASSYE)" from August 19 to 30.

In this program, we welcomed 23 students from 17 universities in 12 different countries.

They were invited to study in NUT laboratories and visited Japanese companies, so that they could experience Japan's Science of Technology innovation, the academic environment and living environment at NUT.

#### University reform

##### ○ Improvement of international education and research and administrative capabilities of faculty and staff

NUT continued to implement various training programs to improve the international abilities of faculty and staff which are essential for the realization of globalization of university. One professor was sent to the U.S. as a sabbatical training for a year, and acquired advanced technology and learned teaching methods under the excellent researcher. In addition to language training on campus, a total of four staff were sent to universities and other institutions in Malaysia and Vietnam to improve their language skills and ability to handle international work.

##### ○ Top Global University Project External Evaluation Committee and Management Meeting

Top Global University Project (TGUP) External Evaluation Committee and Management Meeting were held on Friday, January 31. 10 external members from 6 countries were invited to each meetings of the board. The members are composed of international business experienced managers, presidents of overseas collaborative universities, and representatives who have high insight on international collaboration and industry-academia-government collaboration. TGUP External Evaluation Committee was held for the purpose of supervision, consultation and evaluation in relation to the implementation of the TGUP "The Education Program for Innovative Global Engineers ~ Toward development of an integrated global campus with collaboration between industry, academia and government~".

TGUP Management Meeting was held to discuss and evaluate measures for the sustainability and development of the project focusing on the financial and management aspects.

At both meetings, there were many suggestions and questions from the participants regarding the promotion of the project, and we exchanged views on project and had a very meaningful time.



< Top Global University Project External Evaluation Committee and Management Meeting >

#### Education reform

##### ○ Improvement of English skills of students

Practical English (1st semester of 4th grades) was offered for overseas Jitsumu-Kunren (Internship) applicants, aiming to strengthen English communication skills. In addition, there are extracurricular activities such as "Extensive reading and listening marathon" in which students take the lead role in reading and listening in English after school, and "English at Lunchtime (TELL)" in which international students act as teachers and students learn useful expressions for daily life while watching videos. A total of 527 students participated in the Extensive reading and listening marathon, and 4 students reached 300,000 words in reading, and we could improve the recognition of the need for English communication and presentation skills and the motivation for learning.



英語の基礎を身に付けて  
TOEIC スコア UPです!!  
→ 「多読多聴マラソン」  
日時：毎日 月曜・火曜・水曜・木曜  
18:00~19:00  
場所：ALI (Active Learning 1)

英会話力を強化したい!!  
→ 「TELL」  
日時：毎日 月曜・水曜 コメデイ  
12:10~12:50  
加賀 会館 TED/OII  
12:10~12:50  
場所：ALI 2 (Active Learning 2)  
問合せ：TELL@nut.ac.jp  
TEL: 0254-27-1111 (受付時間: 9:00~17:00)

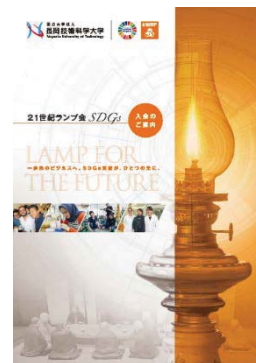
予約不要! 学部生 & 大学院生 & 教職員 大歓迎!  
長岡技術科学大学 語学センター

< "Extensive reading and listening marathon" and "TELL" >

## ■ University's own indicators and targets

### ○ Renewal of The Lamp of Society 21

When NUT was appointed to a United Nations Academic Impact Hub for SDG9 (Industry, Innovation and Infrastructures) by the United Nations in 2018, "The Lamp of Society 21 (membership donation system)" has been renewed to "The Lamp of Society 21 SDGs", and it took a role in contributing to connect the achievement of SDGs and business in addition to supporting global expansion of companies and human resources. Also, we have expanded privilege menu for members that can be used for one year after becoming a member, in order to increase the number of donations from companies, and to acquire our own financial resources toward making the project self-sustaining.



〈 The Lamp of Society 21 SDGs 〉

### ○ Support for globalization of SMEs through GTP network

NUT established overseas bases "GIGAKU Techno Park (GTP)" in strategic regions with a view to overseas business development of Japanese companies. Through GTP network, NUT supported for globalization of new 12 regional companies in FY2019. Also, NUT held 6 international industry-academia activity meetings in Japan and abroad. As neighboring prefectures, such as Nagano and Toyama, asked for collaboration with NUT, GTP network activities have been becoming attractive to other prefectures.

## ■ Initiatives for the enhancement of international reputation/ Featured initiatives based on the characteristics of the university

### ○ Established new 3 offices in Vietnam and Romania

In July, NUT opened the HCMUT-NUT office in Ho Chi Minh City, Viet Nam. In Viet Nam, the HCMUT-NUT Office is the second office after the GIGAKU Techno Park (GTP) Hanoi Office established at Hanoi University of Science and Technology.



〈 HCMUT-NUT Office opening ceremony 〉

In October, we also established the Romania-NUT (RAU) office in Bucharest and the Romania-NUT (BBU) office in Cluj Napoca, Romania. This is the 13th GTP office in 9 countries. By utilizing these overseas bases, we will continue to develop global activities of international research and education cooperation, and international industry-academia collaboration.

### ○ Internship at the company in Nagaoka City for international students

Through the GIGAKU Techno Park (GTP) Hanoi Office established in Hanoi University of Science and Technology (HUST), NUT recruited HUST students who are interested in mechanical design in Japan. These students were selected through an interview by a faculty member of NUT and the host company of the internship program.

This internship was implemented and realized by Nagaoka City as part of the internationalization support for Nagaoka city companies utilizing the GTP network, and it was the first time for host company to accept international students. The two international students energetically worked on the development of construction tools with the support of faculty and mentors of NUT, and the host company highly evaluated their motivation.



〈 International students in internship 〉

## ■ Free description

### ○ 1st GAICCE Alliance Meeting

NUT applied jointly with Chulalongkorn University and others to Collaborative Education Program (CEP) of JICA AUN/SEED-Net. Our Global Academia-Industry Consortium for Collaborative Education (GAICCE) program was adopted, and we held 1st GAICCE Alliance Meeting at Nagaoka City Hall Aore.

Through GAICCE program, we support international students of ASEAN region, furthermore, we create sustainable cooperative environment more multidisciplinary and multilaterally utilizing GTP network and NUT's education program such as Double Degree Program (DDP).



〈 GAICCE Alliance Meeting group photo 〉

### ○ 4th STI-Gigaku 2019

STI-Gigaku is an international conference mostly organized by a student team. This is held to discuss ways to solve global social issues by disseminating and sharing the results of education and research conducted in collaboration with NUT, KOSEN (College of Technology), companies, and local governments in order to achieve the Sustainable Development Goals (SDGs).

STI-Gigaku was held for the 4th time this year, there were lively discussions among the participants in poster sessions and keynote speeches delivered by four experts from Japan and abroad. The conference was finished with a great success.