

## Attempt to establish a credit transfer system between Turku University of Applied Sciences and National Institute of Technology (KOSEN), Nagaoka College.

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Based on the agreement established in 2020 between the National Institute of Technology, Nagaoka College (Nagaoka KOSEN), and Turku University of Applied Sciences (TUAS), a collaborative program began in 2023 after a delay caused by the global COVID-19 pandemic. This program, aimed at enhancing the advanced courses of Nagaoka KOSEN, allows KOSEN students to earn a degree from TUAS, while TUAS students can complete 60 ECTS credits at KOSEN. Three students from TUAS were taken the classes of our Nagaoka Kosen and did research work in laboratories during the stay in Nagaoka Kosen. TUAS students also took regular examinations of Nagaoka Kosen and got the Kosen credits. To transfer the Japanese Kosen credits to European ECTS credits, we have used the idea how many hours students must study for one ECTS and how many hours students must study for one credit of Nagaoka Kosen. Students from TUAS have also done research as well as the group work project together with our Kosen students. Such collaborative group works as well as research projects have promoted the global minds toward our students of Nagaoka Kosen.

In September 2024, two students from Nagaoka Kosen started the degree program of TUAS. Students of Nagaoka Kosen mainly study the subjects about business, marketing and the basics of the finance. Nagaoka students debate with TUAS students in the class. By experiencing and studying these subjects in TUAS, they will cultivate entrepreneurship and the skill of debating using English. The present attempts to establish a credit transfer system between TUAS and Nagaoka Kosen are our first attempts to exchange the credits to the partner institute abroad. We will discuss on the educational benefits and some issues to be solved for the present program.

**Keywords:** credit transfer, student exchange program, degree, business and marketing, entrepreneurship

### Introduction

Recently, Japanese universities and colleges are focusing and developing on the student exchange program abroad. Some of the Kosen also developed the student exchange programs between the institutes abroad.<sup>1), 2)</sup> Our Kosen, Nagaoka College, has also made efforts to increase the number of the partner institutions abroad to promote the student exchange programs.<sup>3)</sup> However, the main program of these student exchange programs are mainly joint collaborations of the group works such as the building the circuits, programming and debating with the recent international topics between the students of partner institutions. Some of the Kosen reached the agreement of the student exchange program with research collaborations. Further advanced attempts are now underway for developing the content of the student exchange program of Kosen.

Dual degree, joint degree and double degree program became popular between universities. Double degree program between European and Japanese universities have been also reported.<sup>4)</sup> Since degree of Kosen is conferred by the National Institute of Academic Degrees and Quality Enhancement of Higher Education, such degree program between universities abroad is difficult. However, if Japanese Kosen students can experience and attend the classes of the partner institutions of Kosen abroad, it will be good program for our Nagaoka Kosen students. For such motivation, we have established the Kosen version agreement of “double degree program” between Turk University of Applied Sciences (TUAS) and Nagaoka College (Nagaoka Kosen) in 2020.<sup>5)</sup> The present paper is the series of the reports on the establishment of the collaborative credit transfer system between Turk University of Applied Science and Nagaoka Kosen. We will report our attempts and the recent progresses on the achievements for the credit transfer system between the international partners of Nagaoka Kosen abroad.

## Acceptance of TUAS Students in Nagaoka Kosen

To transfer the credits from our Kosen to TUAS, we should first understand the different credit system between Japanese Kosen and European university. In Europe, ECTS (European Credit Transfer and Accumulation System) is commonly used since 1990 to increase student exchange between European countries. 1 ECTS is based on the 27 hours' study. On the other hand, credit system of Kosen is a mixture of two different credit systems ("Risyu Credit System, which is nearly equivalent to the high school credit": 1 credit = 30 hours' study, and "Gakusyu Credit System, which is equivalent to the university credit": 1 credit = 45 hours' study). We have used these hours of study for the basis of transferring the Japanese Kosen credits such as "Risyu" credits and "Gakusyu" credits to the TUAS credit (ECTS). We have also incorporated the basic subjects of Nagaoka Kosen to the credits of TUAS. For such incorporations of the subjects taken in Nagaoka Kosen, students of TUAS who stayed one year at Nagaoka Kosen from autumn semester of 2023 to spring semester of 2024 can earn 60 ECTS toward the degree after they go back to TUAS. Table 1 is an example of the timetable TUAS students during the stay in Nagaoka Kosen.

Table 1. Example of the timetable of TUAS student.

開講学期 Semester	曜日・時間 Day and Period	授業科目 Subject	ECTS Credits	単位 Credits	担当教員 Instructor
2023 3rd and 4th	Tuesday 12:50-14:20	Electronic Devices (電子デバイス)	3	2	Prof. Shimamura
2023 3rd and 4th	Tuesday 14:30-16:00	Study of Self-Development Subject (自己啓発型 研究科目)	1.05	1	Prof. Iyama, Prof. Toyama
2023 3rd and 4th	Friday 14:30-16:00	English IV (英語IV)	3	2	Prof. Tsuka, Prof. Thonet
2023 4th	Monday 12:50-16:00	Global debate (グローバルディベート)	3	2	Prof. Toyama, Prof. Naito, Prof. Tsuka
2023 4th	Tuesday 8:40-10:10 Thursday 8:40-10:10	Physical properties of electronic materials (電子物性 工学)	3	2	Prof. Shimamura
2023 3rd and 4th		Thesis work I (電子機械システム工学特別研究 Ⅰ)	6	4	Prof. Ikeda
2023 3rd and 4th		Thesis work II (電子機械システム工学特別研究 Ⅱ)	18	10	Prof. Ikeda
2024 1st and 2nd	水1-2限	Electrical materials I (電気電子材料Ⅰ)	3	2	Prof. Shimamura
2024 1st and 2nd	水3-4限	Information processing II (情報処理Ⅱ (C言語))	3	2	Prof. Yamamoto
2024 1st and 2nd	水3-4限	Mechanical Design and Engineering (機械設計工学)	3	2	Prof. Kaneko
2024 1st and 2nd	水1-2限	English V C (英語VC)	3	2	Prof. Ichimura
2024 2nd	金5-6限、水5-6限	Advanced Seminars (専攻科ゼミナール)	3	2	Prof. Ikeda
2024 1st and 2nd	水7-8限	Health, Physical Education (保健・体育)	1.05	1	Prof. Iida, Prof. Ichikawa, Prof. Kiyu

Students of TUAS attended the classes of Nagaoka Kosen during the program. Although students of TUAS attended the class of Nagaoka Kosen had difficulties in listening the class and reading Japanese textbooks, students of TUAS had finally passed the exams by the helps of the translation of the class materials to English or black board writing in English by the teachers. For the class of the collaborative group work, there were fewer problems. Students from TUAS were joined to the group of the Kosen students and made discussions about the project.



Figure 1. Example of the class (collaborative group work)

Figure 1 is one of the pictures that the three TUAS students collaborated with Kosen Students together. The TUAS students have also performed the research work by belonging one of the laboratories of Nagaoka Kosen. They wrote the thesis for the research work done in Nagaoka Kosen and the presentation of the research work was also performed in front of the Japanese Kosen students in English. This might be good experiences for the students at Nagaoka Kosen to be exposed in debates on the research work in English between TUAS student and teachers in Nagaoka Kosen.



Figure 2. Presentation of the research work in front of Kosen students.

For the life in the laboratory, they spend the time with the students in the laboratory of Nagaoka Kosen. One of the TUAS students went to the Japanese conference for the discussion of the research work together with our students. Figure 3 is the picture of the farewell parties for TUAS students. They finally got the credits of Nagaoka Kosen. TUAS students has gone back to TUAS and with our credits of Nagaoka Kosen in 2024, they will be awarded the degree of TUAS for the first time.



Figure 3. Picture of the farewell party for TUAS students with students of the laboratory members of Nagaoka Kosen.

## Sending of Nagaoka Students to TUAS

In recent years, the importance of entrepreneurial education in higher educational institution is growing. Since the Turk University of applied science is known as one of the advanced institutes that educate both of the technology and entrepreneurship together.<sup>6)</sup> For the

students of Nagaoka Kosen, it is the very good opportunities to study in the class of TUAS using the present credit transfer systems. For such purposes, our Nagaoka students went to TUAS in autumn 2024 and now they are studying at the faculty of Industrial Management and Engineering to get the bachelor's degree of TUAS. To get the degree, they have to accomplish one-year (2 semesters) classes from the autumn 2024 to spring 2025. The credit transfer from Nagaoka Kosen ("Risyu" high-school credit and "Gakusyu" university credits) to TUAS (European Credit Transfer and Accumulation System (ECTS) credits) will be also carried out for our Nagaoka students to get the degree of TUAS. The credits of thesis research work of Nagaoka Kosen are also be transferred to those of TUAS project work, which is included in the agreements for the double-degree program between Nagaoka students and TUAS students. Since 240 ECTS in total is the requirement of the degree in TUAS, credit transfer from Nagaoka Kosen to TUAS was included in the agreement. Below are the details of the agreements for our Nagaoka Kosen students to take a degree of TUAS.

Degree and degree Programme at TUAS:  
Bachelor of Engineering in Industrial Management and Engineering.

The students must have completed 240 ECTS in total to be eligible for the degree, which consists of

- 1) Minimum 135 ECTS credits at Nagaoka KOSEN
- 2) Minimum 60 ECTS credits at TUAS courses
- 3) 30 ECTS practical training
- 4) 15 ECTS Thesis final project at Nagaoka KOSEN and a written summary in English to TUAS. Supervisors will be from both institutes.

Figure 4 is the class of TUAS that teaches the business communications. The student from Nagaoka Kosen learn how to communicate to the customers with practical training. Students who attend this class is planned to participate in a business contest in Finland.

Figure 5 is the picture of the class of TUAS, which debates about the differences of the environmental issues between Japan and Germany. Students of Nagaoka Kosen learned the differences of the environmental problems between Japan and Germany in the class.



Figure 4. Example of the class (business)



Figure 5. Example of the class (Environment and business).

Figure 6 is the picture of the class, which teaches about the business based on the theories. The teacher in Figure 6 had the experiences at the company and he talks about his experiences about the business at the company.



Figure 6. Example of the class (Business).

The students who now study TUAS will be back in the spring 2025 and start the final thesis works at Nagaoka Kosen again and the credits of the final thesis in Nagaoka Kosen will be transferred to TUAS and use as the ECTS credits of TUAS for the bachelor's degree of TUAS. Therefore, the bachelor's degree of TUAS will be awarded to the Nagaoka student after he was completed and awarded the advanced course programs of Nagaoka Kosen. The dispatched period of the program with the bachelor's degree of TUAS and the advanced course of Nagaoka Kosen is shown in the Figure 7. Because the advanced course of Nagaoka Kosen introduced the quarter system, Nagaoka students can choose the period when to go to TUAS. To get the bachelor's degree of TUAS, both for the 1st and 2nd grades of the advanced course is now available and if they decided, they will be in TUAS from the autumn semester to the spring semester of TUAS for one year.

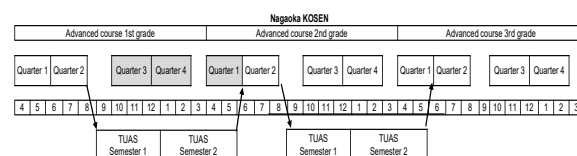


Figure 7. Dispatched period of the bachelor's degree program of TUAS for Nagaoka students.



## Results of questionnaires to the Nagaoka students and teachers.

To share our educational effects on the present degree program, questionnaires to the Nagaoka students who went to study in TUAS for the bachelor's degree and to the teachers who had the class to the TUAS students who had stayed to study in TUAS in 2024 have been performed.

Students:

(Q1) Why do you want to decide to go to TUAS for the bachelor's degree?

I was interested in studying abroad. I wanted to study not only engineering at a technical college but also engineering management in Finland.

I thought that the present program would help my professions that utilized the specialized knowledge in science and engineering as well as language skills.

If I can achieve it, it will be the first example.

I wanted to build new relationships during the advanced course at Nagaoka Kosen. There are three universities in Turku, and the students at these universities come from all around the world. I think this is an attractive aspect of the present program.

(Q2) How difficult was it to listen and to discuss using English in the classes of TUAS?

Very difficult: Difficult

(Q3) What do you think the class of TUAS will be useful in your future after you come back Japan?

Very Useful

It depends on the person. Most of the Kosen students will work for engineering, there may not be many situations where business skills can directly apply to our Kosen students.

Teachers:

(Q4) How were the influences on the Kosen students to have a class with TUAS students?

Class materials were translated to English and these materials influenced the Kosen students from abroad as well as the Japanese Kosen students. Students were forced to use English in their everyday conversations in the lab and also the discussions at research meetings. It is believed that students' reading and speaking skills have improved.

## Conclusions

The present attempts to have the student exchange program with the credit transfer systems between two

institutes of Nagaoka and TUAS are now underway, and here the progress of the present program was reported. New types of student exchange programs between Kosen partners abroad have to be developed in future. In that sense, the present challenge will be an example for our future collaboration between Kosens and the Kosen partner institutions abroad.

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