Tokyo University of Agriculture and Technology (TUAT)

WISE Program
(Doctoral Program for World-leading Innovative & Smart Education)

Excellent Leader Development for Super Smart Society by New Industry Creation and Diversity

WISE-TUAT
東京農工大学
卓越大学院プログラム

Course Guide 2023

(May 2023)

Introduction

The world is moving toward an era with a global population of 9 billion, and Japan is facing many social problems due to its declining and aging population. In response to such issues, the Tokyo University of Agriculture and Technology—in its role as a scientific research university focuses on the fields of agriculture and engineering—is cultivating high-level innovation leaders capable of action on the international stage, through a combination of problem-exploration abilities in agriculture and problem-solving abilities in engineering. Many points of the Sustainable Development Goals (SDGs) for 2030, in particular, involve agriculture and engineering. Furthermore, understanding diversity is respecting each other with respecting minority opinions. That leads us to have a multitude of options for responding to challenges. That increases your individual and organizational resilience, and produces potentials to solve problems as a leader, the core of the team. “Excellent Leader Development for Super Smart Society by New Industry Creation and Diversity”—That is the heart of the WISE Program, which brings together the strengths of the Tokyo University of Agriculture and Technology.

WISE-TUAT
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WISE Program, Tokyo University of Agriculture and Technology
http://www.wise.tuat.ac.jp

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1. Overview of the WISE Program

Launched in 2018, the Doctoral Program for World-leading Innovative & Smart Education (WISE Program) is a five-year integrated doctoral degree program bringing together world-class education and research capabilities—a collaboration of universities, research institutions, and private companies structured around the strengths of the individual universities. Based on this approach, the program develops excellent human resources with doctoral degrees capable of driving a variety of sectors in agriculture, engineering, and related fields. Through human resource development and academic/technical exchange both domestic and overseas, we will spark innovation, and form a hub of excellence that can be continually expanded. WISE program offers five-year integrated education from master to doctoral programs in cooperation with overseas research and education institutions and private companies, with the keywords of "collaboration of agriculture and engineering", "creation of new industries" and "diversity". The program promotes research on the "fusion and collaboration of advanced knowledge and technology in agriculture and engineering" and fosters advanced doctoral human resources who will play a key role in building a super-smart society.

1.1 Significance and Distinctive Features of Study in the WISE Program

Significance

Global innovation is accelerating in today's world, and there is a need for human resources with doctoral degrees to spark innovation. Realizing the Society 5.0 “Super Smart Society,” in particular, will require the ability to solve social problems while leveraging academic specialization. At TUAT, we bring together agriculture and engineering capabilities, and enable innovation through creation of new industries and diversity. Furthermore, as social changes—such as shrinking and aging of the population in Japan, and growth of the global population—there is a strong need for diversification of graduate school education and recurrent education across ages and genders as we move toward an era where the human life-span will be 100 years. It is also essential to appreciate diversity of gender, age, cultural/social background, and other characteristics.,

In responding to such demand, this Program provides educational opportunities to foster students’ research and innovation-producing potential with “Creation of New Industries” and “Diversity,” taking advantage of its strengths of collaboration of agriculture and engineering of TUAT. The program has a system to enable students to strengthen their big-picture perspective for using knowledge horizontally while keeping to their existing specialized knowledge and techniques. The curriculum is designed for students to put their acquired academic knowledge into the engineering level.

WISE students are expected to engage in an industry-academic joint research with their own initiatives and acquire the foundation as “a professional of knowledge” who is leading Super Smart Society.

Distinctive Features

The WISE Program incorporates: (1) Support for study and travel abroad, (2) Support for collaboration with company, (3) Support for active learning, and (4) Support after the program completion.

As support for study and travel abroad, the WISE Program provides various types of economic assistance for cultivating global human resources. For example, we provide financial support for short-term study abroad, participation in international conferences, travel expenses for field research and other research activities. Research assistant (RA) expenses may support your research life. We also provide and guide you opportunities to strengthen your English language skills for preparation in those overseas studies. As support relating to work experience, students can take lectures by experts actually working at private firms or partner research institutions, and learn reality in the industrial sectors. This will enable to further expand the depth and breadth of your current research by learning about examples of social application (implementation) of research results and understanding related issues.

Each program student assembles a portfolio of what he or she has learned through lectures, exercises, and other experiences, and continuously evaluate him or herself regarding learning achievements and/or acquired skills. Competency evaluation is also performed to encourage independent self-growth. This involves self-evaluation - as well as evaluation by advisors and faculty members of partner institutions -of student abilities in terms of problem-setting, development of solutions, idea generation, big-picture thinking, diversity, management, leadership, Creation of New Industries and practical action. These data can be checked via the Internet using a smartphone or other device, and students can actively learn while confirming, at any time, how experiences in the program connect with the student's own growth.

We hope that students who complete the WISE program will themselves expand into various industries in Japan and overseas and create new industries (= New field creation through the cutting-edge research skills). In addition to that, we will build and introduce “a doctor matching system,” which is designed to connect students with private companies and/or related institutions for students to broaden their horizons or a network of people.

1.2 Vision of Human Resources Cultivated by the WISE Program

In the WISE program, we provide a 5-year integrated program (master's + doctorate) to foster doctorate-holding human resources with the following three characteristics:. Students who have completed a master's course are also accepted to start a conventional doctoral program (second phase of the integrated program). The goal of the WISE Program is to foster human resources with the following three characteristics, and the curriculum has been designed for those purposes: (1) Challenging “creating new industries through agri-engineering collaboration” and thereby leveraging cutting-edge engineering technology to solve the social challenges relating to agriculture, (2) Strengthening the understanding of diversity (gender, nationality, social experiences, etc.) which is essential for innovative human resources, and (3) Excellent leadership with a big-picture perspective, originality, appreciation of diversity, international competitiveness, and high-level specialization.

1.3 Admission Policy, Curriculum Policy, and Diploma Policy

Admission Policy

Our aim is to develop excellent leaders with specialization and big-picture thinking from an international perspective, and we are looking for human resources with the following qualifications:

・Admission for the five-year integrated course

- Satisfactory basic academic ability in agriculture, engineering, and related fields
- The diversity mindset needed for research activities in international society and English skills and communication skill for practical activities
- Wide-ranging perspective and interests, with the spirit of inquiry and execution ability for deploying highly creative research and technology to create new industries

・Admission for the doctoral course only

The following in addition to the above:

- Specialized knowledge and skills as a holder of a master's degree, as well as strong interest and desire in a specialized research domain and related fields, and the desire and diversity mindset for driving innovation to create new industries

Curriculum Policy

We offer an educational curriculum for developing excellent leaders capable of driving the creation of new industries based on a diversity mindset in international society.

A) Acquisition of high-level specialized knowledge on international cutting-edge results in agriculture, technology, and related fields, through multifaceted lectures and exercises in areas ranging from natural science to the humanities and social science

B) Cultivation of basic knowledge and techniques in the student's own specialty; acquisition of methods for approaching global social issues, big-picture thinking, and logical thinking; creation of new industries and sparking innovation by learning cutting edge knowledge and experimental techniques; and acquisition of practical techniques

C) Establishing global standard research ethics, intellectual property management, and other attributes needed by a researcher or specialized engineer

D) Cultivation of a global standard diversity mindset, language skills, human skills needed for presentation and debate, and leadership ability for carrying out research or projects

Diploma Policy

We cultivate excellent leaders with the following four characteristics for driving the creation of new industries based on a diversity mindset in the global society.

A) Outstanding specialized capabilities as an independent researcher or creative engineer in the own area of specialization

B) Abilities in big-picture thinking, logical thinking, creative thinking, and practical action enabling execution of industry-academia collaboration and multidisciplinary research to create new industries

C) Leadership ability enabling management of people in different fields from the perspective of diversity to solve problems with both global and local perspectives

D) Ability to bring together the results of one's own research and investigation as reports or academic papers, and produce research results and to present or provide those results at academic meetings and international conferences with research ethics

1.4 Visualization of Learning through Competency Evaluation

In the WISE Program, we use competency evaluation as an indicator allowing individual students to visualize in real-time their progress in terms of the curriculum and diploma policies presented in 1.3. This information is also useful for future learning and activities.

Competency is an indicator of personal characteristics linked with action and thinking which bring high performance in such as research, education, and companies. In companies, they analyze the behavioral characteristics of "high- performers" to extract their behavior and thinking which resulted in high performance, and use them for their human resources allocation and education.

In WISE program, we have analyzed the ideal of excellent leaders in the science-technology field capable of acting on the global stage, and extracted nine important competencies: problem-setting, development of solutions, idea generation, big-picture thinking, diversity, management, leadership, creation of new industries and practical action. These competencies can be obtained by learning, experiences, or training regardless of person's natural character or personality.

	Keyword	Competency gained at completion of the WISE Program
Conceptual	Problem setting	Identifies social problems through appropriate information gathering
	Development of solutions	Develops the best solution for solving social problems
	Idea generation	Generates creative ideas for social implementation
	Big-picture thinking	Has big-picture perspective/thinking for creating new industries
Human	Diversity	Makes decisions with a diversity perspective
	Management	Respects diverse values, and employs the best coordination and negotiation in each situation (society)
	Leadership	Clearly demonstrates his or her own reason for being in a global society (using English), and attracts people
Technical	New industry creation	Acquires cutting-edge knowledge and technology in engineering and agriculture for creating new industries
	Practical action	Cutting-edge technologies in agriculture and engineering are practically used for researches and projects.

Competency evaluation is conducted twice a year at the end of the first half and at the end of the second half. In addition to a self-evaluation by individual students, the faculty members and the specially-appointed faculty members of the WISE Program also make the evaluation through the portfolio (described later). At the end of the second half, the student's supervisor joins the evaluation and shares the student's growth.

Based on these competency assessments, the program students and related faculty members are able to understand the students' strengths and weaknesses, the necessary points to be developed for the future, and challenges to be outstanding leaders. This helps the students to make effective plans of learning and activities.

1.5 Curriculum Characteristics and Course Tree

(1) Curriculum Characteristics

In the WISE Program, years 1–5 of the integrated doctoral course are indicated as follows: 1st year (**P1**), 2nd year (**P2**), 3rd year (**P3**), 4th year (**P4**), 5th year (**P5**).

In P1, through lectures by cutting-edge researchers, students learn about the development of collaborative research in agriculture and engineering and examples of social implementation of research, and consider the development of their own research. In addition, the "Problem Exploration Program" is conducted in collaboration with companies through PBL (Project Based Learning, Problem Solving), in which students tackle problems through group work. In terms of diversity, students will deepen their basic understanding of diversity and inclusion and leadership diversity. By utilizing online overseas training programs conducted jointly with overseas partner institutions and the "Study Abroad Support Program," students can develop the basic English communication skills and international mindset necessary to be a global outstanding human resource. Those who wish to do so can plan and apply for research and research-related activities on their own initiative, using the "Proposal-based Project Funding Support," etc., and develop their ability to make proposals. Through these activities, students will gain an understanding of social issues, deepen and develop their specialized research, and promote an understanding of diversity.

In P2, students learn from partner companies about R&D in the industrial world and actual examples of commercialization of research, and consider how to develop their research in the real world by applying it to their own research. In addition, students will learn specifically about doctoral careers and life events as a doctoral student, and draw their future life plans based on the various careers and lives that surround doctoral students. At the end of P2, students take the Qualifying Examination (QE1) as a mid-term review of their achievement in the program.

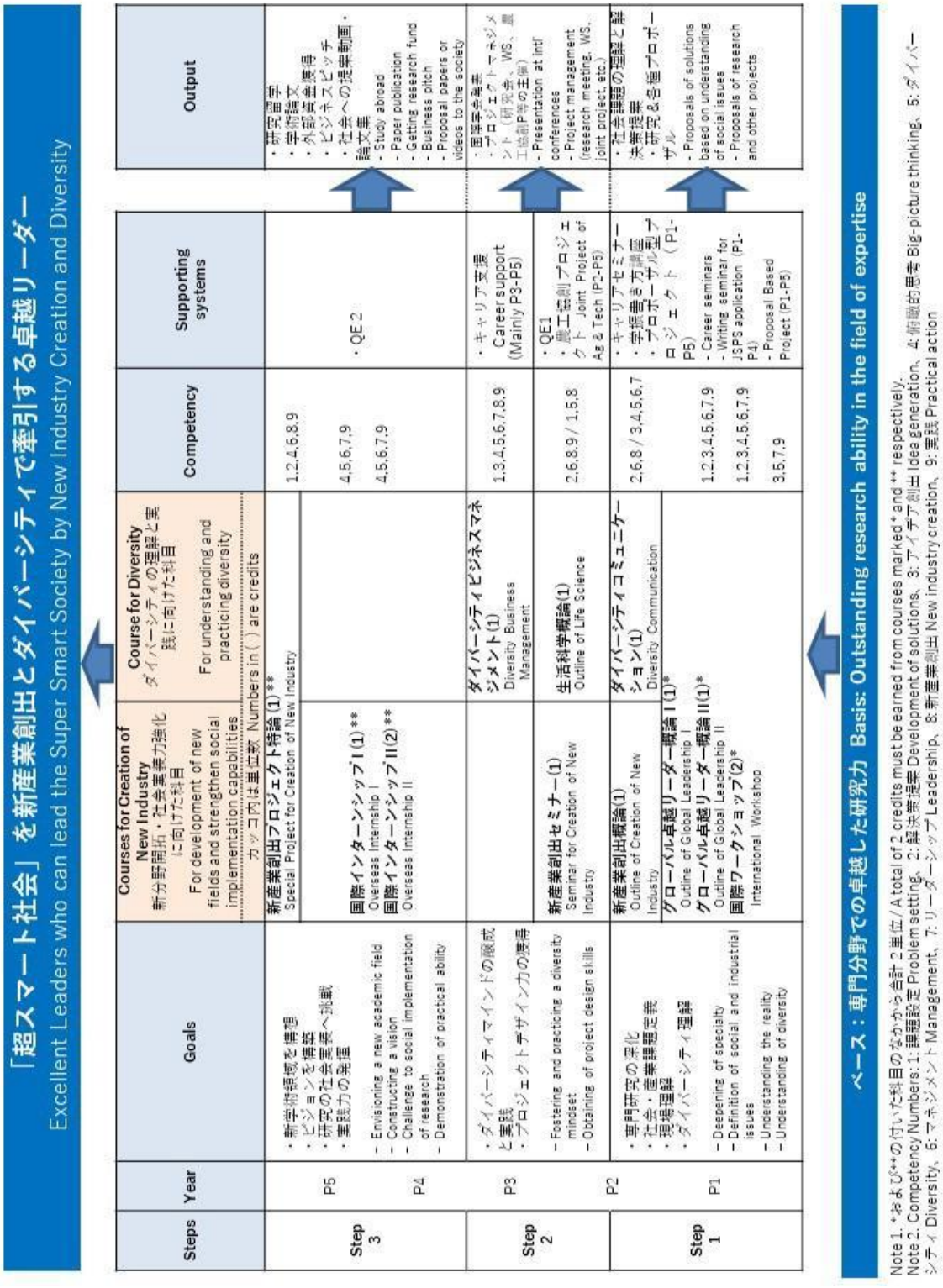
From P3, we will accelerate the strengthening of our research capabilities and at the same time, we will be more active in social implementation and practice. For example, we will engage in global practices such as international joint research and study abroad at overseas partner institutions. Students may also devise commercialization ideas based on the results of their research and challenge business idea contests, or, if they wish, utilize the " Joint Project of Agriculture, Engineering and Interdisciplinary Researches" to engage in agriculture-industry cooperative creation research, prototype production, demonstration experiments, and other practical activities. In the diversity course, students learn the importance of diversity management in academia and industry based on case studies, with a view to after graduation. In the final course, students will develop a vision of the society they wish to create with their research at its core, boldly envision new academic fields and new industries to be pioneered, and work to develop the organizations necessary to achieve these visions and demonstrate them to society. When appropriate, the students can receive advice from leading researchers within the university, faculty members with experience in social implementation, and partner companies.

In P5, each student works toward the completion of the doctoral program in his/her department. If the student is expected to complete the doctoral program, he/she will undergo the Qualifying Examination (QE2), which is the final examination of his/her achievement in the WISE Program in practical skills, diversity acquisition, and leadership for the creation of new industries and the development of new academic fields. Upon successful

completion of the QE2, a statement of completion of the Graduate Program for Graduate Excellence will be affixed to the student's degree.

(2) Course Map

Ideally, you should take the three steps of the required courses according to this curriculum map. Please work to achieve the goals and output of each step.



Note 1: *および**の付いた科目のなかから合計 2 単位 / A total of 2 credits must be earned from courses marked * and ** respectively.
Note 2: Competency Numbers: 1: 課題設定 Problem setting、2: 解決策提案 Development of solutions、3: アイデア創出 Idea generation、4: 俯瞰的思考 Big-picture thinking、5: ダイバーシティ Diversity、6: マネジメント Management、7: リーダーシップ Leadership、8: 新産業創出 New industry creation、9: 実践 Practical action

2. Courses and requirements

Students in the WISE Program belong to the Graduate School of Agriculture, the Graduate School of Engineering, the United Graduate School of Agricultural Science, the Cooperative Division of Veterinary Sciences, or the Graduate School Bio-Applications and Systems Engineering. To graduate, students must meet the study requirements of their departments. In addition, completion of the WISE Program is recognized when the student completes the following courses offered in the WISE Program and passes the QE1 and QE2.

2.1 Overview of courses categories

The following course groups have been arranged to build the foundation of leaders who can drive innovation by linking and integrating agriculture, engineering, and related fields. Categories (1)–(4) below are studied mainly in the periods P1 and P2, while (5) and (6) are studied from P3 to P5.

(1) Basic Courses for TUAT Co-Creation

By learning basic courses relating to agriculture, engineering, and related fields, knowledge essential for appreciating diversity, and the basic science of food and living, students are expected to cultivate specialized knowledge and a cross-cutting perspective to build a foundation for generating innovation.

(2) Basic Courses for Industry-Government-Academia Collaboration

From partner organizations (companies and research institutions) both domestic and overseas, students learn the realities of joint research, and the procedures for securing research funds and reporting on research, and gain a clearer view of the significance in the research and technology development process. Instructors are invited from partner organizations to broaden understanding of technology development in front-line settings such as companies and research centers.

(3) Courses for International Training

Students acquire a basic foundation for leadership in projects that move from problem-exploration to solution. They do this through double degree programs with overseas partner universities, overseas training, studying abroad, overseas joint research, and similar activities. In addition, students learn the process of research and technology development in diverse environments through activities such as practical internships and joint research with partner institutions.

(4) Special Courses for TUAT Co-Creation

Students learn the specialized knowledge of agriculture, engineering, and related fields which forms the core of innovation, and then undergo practical training for putting those specialized skills into practice. In particular, we foster the knowledge and techniques of data mining that enable analysis, evaluation, and examination of multifaceted, large-scale data.

(5) Advanced Courses for TUAT Co-Creation and Industry-Government-Academic Collaboration

Students acquire a foundation enabling formation and management of groups capable of bringing out the best performance from the diverse human resources with various backgrounds needed in research and technology development at universities, research institutions, and companies.

(6) Advanced Exercise for TUAT Co-Creation and Industry-Government-Academic Collaboration

By proposing practical projects using the student's own specialized knowledge, and collaborating with people in the field and partner organizations in Japan and overseas, students learn problem-solving techniques and specific examples of approaches and management for creating new industries.

(7) Courses for Special Evaluation

Students can apply for credits and competencies in this course group, if they voluntarily attend extracurricular seminars and courses and meet certain conditions aiming to become an outstanding global PhD candidate. Those credits cannot be included in the credits required for QE and completion of the WISE Program.

2.2 Course table (For regular students enrolled from P1)

科目群 Subject category	科目名 Course name	単位数 Number of credits		P1				P2				P3				P4				P5				2023年度　担当教員 Name of the instructors in AY2021 ★Principal TOKUNIN
		必要数 Required number	科目別 Credits	1Q	2Q	3Q	4Q	1Q	2Q	3Q	4Q	1Q	2Q	3Q	4Q	1Q	2Q	3Q	4Q	1Q	2Q	3Q	4Q	
農工協創基盤科目群 Basic Subjects for TUAT Co-Creation	ダイバーシティコミュニケーション Diversity Communication	2	1			◎	◎			◎	◎													堀切、★栗原 Horikiri, ★Kurihara
	生活科学概論 Outline of Life Science		1			●	●			●	●													実践女子：　於保、白尾 農工大：　吉野、★栗原 Jissen Women's Univ.: Oho, Shirao TUAT: Yoshino, ★Kurihara
	データサイエンス概論 Outline of Data Science		1			●	●			●	●													近藤、★栗原 Kondo, ★Kurihara
産官学連携科目群 Basic Subjects for Industry-Government-Academia Collaboration	新産業創出概論 Outline of Creation of New Industries	2	1	◎	◎			◎	◎															三沢、滝山、★尾崎、栗原 Misawa, Takiyama, ★Ozaki, Kurihara
	新産業創出セミナー Seminar for Creation of New Industries		1	◎	◎			◎	◎															斎藤、澁澤、★尾崎 Saito, Shibusawa, ★Ozaki
国際科目群 Subjects for International Training	グローバル卓越リーダー概論Ⅰ Outline of Global Leadership I	2	1		●				●															大津、★栗原 Ohtsu, ★Kurihara
	グローバル卓越リーダー概論Ⅱ Outline of Global Leadership II		1		●				●															大津、★栗原 Ohtsu, ★Kurihara
	国際交流ワークショップ* International Workshop		2			●				●		QE1											QE2	吉田、大津、船田、★尾崎、栗原 Yoshida, Otsu, Funada, ★Ozaki, Kurihara
農工協創専門科目群 Special Subjects for TUAT Co-Creation	国内外実習Ⅰ* Practical Training in Domestic and Overseas I	2	2	◎	◎	◎	◎	◎	◎	◎	◎													大津、★栗原 Ohtsu, ★Kurihara
	国内外実習Ⅱ* Practical Training in Domestic and Overseas II		2	○	○	○	○	○	○	○	○													大津、★栗原 Ohtsu, ★Kurihara
	データサイエンス演習 Exercise for Data Science		1			○	○			○	○													近藤、★栗原 Kondo, ★Kurihara
農工協創産官学連携国際科目群 Advanced Subjects for TUAT Co-Creation and Industry-Government-Academia Collaboration	ダイバーシティビジネスマネジメント Diversity Business Management	1	1											◎	◎			◎	◎			◎	◎	岩田、★栗原 Iwata, ★Kurihara
	新産業創出特別セミナー Special Seminar for Creation of New Industries		1									○	○	○	○	○	○	○	○	○	○	○	○	笹原、★尾崎 Sasahara, ★Ozaki
農工協創産官学連携国際演習科目群 Advanced Excerceise for TUAT Co-Creation and Industry-Government-Academia Collaboration	新産業創出プロジェクト特論 Special Project for Creation of New Industries	1	1										●					●			●			大津、★尾崎、栗原 Ohtsu, ★Ozaki, Kurihara
	国際インターンシップⅠ* Oversea Internship I *		1									●	●	●	●	●	●	●	●	●	●	●	●	斎藤、豊田、★栗原 Saito, Toyoda, ★Kurihara
	国際インターンシップⅡ* Oversea Internship II *		2									●	●	●	●	●	●	●	●	●	●	●	●	斎藤、豊田、★栗原 Saito, Toyoda, ★Kurihara
特別評価科目群 Subjects for Special Evaluation	卓越大学院展開セミナーⅠ* Extended WISE Seminar I	0	1	随時 As needed								随時 As needed												大津、★栗原 Ohtsu, ★Kurihara
	卓越大学院展開セミナーⅡ* Extended WISE Seminar II		1	随時 As needed								随時 As needed												大津、★栗原 Ohtsu, ★Kurihara
	卓越大学院展開セミナーⅢ* Extended WISE Seminar III		1	随時 As needed								随時 As needed												大津、★栗原 Ohtsu, ★Kurihara

◎: Required, ●: Required elective , ○: Recommended, *: Transferable Course

*：Transferable Course

For transferring courses, courses offered in the student's department and/or activities applicable to transferring can be transferred upon applying them with "WISE Program Credit Application Form."

Please check "2.7 Credit Transfer Application" for more details before applying

2.3 Completion requirements

To complete the WISE Program, students must meet the completion requirements of their department, and pass the QE below or "Section 2.5" of WISE Program.

✔ QE1 (Basic abilities as WISE Ph.D. holders) requirements

In order to take QE1, students must have the expectation of passing the final defense of the master's thesis in their departments and have acquired 8 credits or above in total from the following courses.

TUAT Collaboration Basic Courses	2 credits or above
Basic Courses for Industry-Government-Academia Collaboration	2 credits
Courses for International Training	2 credits or above
Special Courses for TUAT Co-Creation	2 credits or above

* Students wishing to complete the program in a shorter period can consult with us.

✔ QE2 (Abilities as WISE Ph.D. holders) requirements

In order to take QE2, students must have the expectation of passing the final defense of the doctoral thesis in their departments and have acquired 2 credits or above in total from the following courses.

Advanced Courses for TUAT Co-Creation and Industry-Government-Academia Collaboration	1 credit or above
Advanced Exercise for TUAT Co-Creation and Industry-Government-Academia Collaboration	1 credit or above

* Students wishing to complete the program in a shorter period can consult with us.

2.4 Transferred students from P3

(1) Completion Requirements

Students transferred from P3 to the integrated doctoral course, or only the doctoral portion of the integrated course, must meet all of the following requirements in order to complete the WISE Program.

1 Students should meet the completion requirements in the department to which each student belongs and have acquired 6 credits or above in total; "Diversity Business Management (1 credit)", "Special Project for Creation of New Industries (1 credit) or International Internship I (1 credit) or International Internship II (2 credit)" shown in **2.5 (3) QE2 requirements**, as well as "Outline of Life Science (1 credit) or Outline of Data Science (1 credit)", "Outline of Creation of New Industries (1 credit) ", "Outline of Global Leadership I (1 credit)," and "Outline of Global Leadership II (1 credit)".

2 The student must take and pass Qualifying Examination 2 (QE2) and Ph.D. defense.

(2) Course table (For transferred students from P3)

科目群 Subject category	科目名 Course name	単位数 Number of credits		P3				P4				P5					2023年度 担当教員 Name of the instructors in AY2021 ★Principal TOKUNIN
		必要数 Required number	科目別 Credits	1Q	2Q	3Q	4Q	1Q	2Q	3Q	4Q	1Q	2Q	3Q	4Q		
農工協創基盤 科目群 Basic Subjects for TUAT Co-Creation	ダイバーシティコミュニケーション Diversity Communication	1	–	3-4Q 聴講可 Open for auditing													堀切、★栗原 Horikiri, ★Kurihara
	生活科学概論 Outline of Life Science		1			●	●			●	●			●	●		実践女子： 於保、白尾 農工大： 吉野、★栗原 Jissen Women's Univ.: Oho, Shirao TUAT: Yoshino, ★Kurihara
	データサイエンス概論 Outline of Data Science		1			●	●			●	●			●	●		近藤、★栗原 Kondo, ★Kurihara
産官学連携科目群 Basic Subjects for Industry-Government-Academia Collaboration	新産業創出概論 Outline of Creation of New Industries	1	1	◎	◎			◎	◎			◎	◎				三沢、滝山、★尾崎、栗原 Misawa, Takiyama, ★Ozaki, Kurihara
	新産業創出セミナー Seminar for Creation of New Industries		–	1-2Q 聴講可 Open for auditing													斎藤、澁澤、★尾崎 Saito, Shibusawa, ★Ozaki
国際科目群 Subjects for International Training	グローバル卓越リーダー概論Ⅰ Outline of Global Leadership I	2	1		◎				◎				◎				大津、★栗原 Ohtsu, ★Kurihara
	グローバル卓越リーダー概論Ⅱ Outline of Global Leadership II		1		◎				◎				◎				大津、★栗原 Ohtsu, ★Kurihara
	国際交流ワークショップ* International Workshop		–	11月ドイツ研修は応相談 Training in Germany in November, contact WISE												QE2	吉田、大津、船田、★尾崎、栗原 Yoshida, Otsu, Funada, ★Ozaki, Kurihara
農工協創専門科目群 Special Subjects for TUAT Co-Creation	国内外実習Ⅰ* Practical Training in Domestic and Overseas I	0	2	○	○	○	○	○	○	○	○	○	○	○	○		大津、★栗原 Ohtsu, ★Kurihara
	国内外実習Ⅱ* Practical Training in Domestic and Overseas II		2	○	○	○	○	○	○	○	○	○	○	○	○		大津、★栗原 Ohtsu, ★Kurihara
	データサイエンス演習 Exercise for Data Science		1			○	○			○	○			○	○		近藤、★栗原 Kondo, ★Kurihara
農工協創産官学連携国際科目群 Advanced Subjects for TUAT Co-Creation and Industry-Government-Academia Collaboration	ダイバーシティビジネスマネジメント Diversity Business Management	1	1			◎	◎			◎	◎			◎	◎		岩田、★栗原 Iwata, ★Kurihara
	新産業創出特別セミナー Special Seminar for Creation of New Industries		1	○	○	○	○	○	○	○	○	○	○	○	○		笹原、★尾崎 Sasahara, ★Ozaki
農工協創産官学連携国際演習科目群 Advanced Excerceise for TUAT Co-Creation and Industry-Government-Academia Collaboration	新産業創出プロジェクト特論 Special Project for Creation of New Industries	1	1		●				●				●				大津、★尾崎、栗原 Ohtsu, ★Ozaki, Kurihara
	国際インターンシップⅠ* Oversea Internship I *		1	●	●	●	●	●	●	●	●	●	●	●	●		斎藤、豊田、★栗原 Saito, Toyoda, ★Kurihara
	国際インターンシップⅡ* Oversea Internship II *		2	●	●	●	●	●	●	●	●	●	●	●	●		斎藤、豊田、★栗原 Saito, Toyoda, ★Kurihara
特別評価科目群 Subjects for Special Evaluation	卓越大学院展開セミナーⅠ* Extended WISE Seminar I	0	1	随時 As needed													大津、★栗原 Ohtsu, ★Kurihara
	卓越大学院展開セミナーⅡ* Extended WISE Seminar II		1	随時 As needed													大津、★栗原 Ohtsu, ★Kurihara
	卓越大学院展開セミナーⅢ* Extended WISE Seminar III		1	随時 As needed													大津、★栗原 Ohtsu, ★Kurihara

◎: Required, ●: Required elective , ○: Recommended, *: Transferable Course

*：Transferable Course

For transferring courses, courses offered in the student's department and/or activities applicable to transferring can be transferred upon applying them with "WISE Program Credit Application Form."

2.5 Qualifying Examinations (QE)

In the WISE Program, at the P2 and P5 stages, the degree of achievement of the research and other abilities to be acquired in this program is evaluated. Please understand well the "Goals to be achieved" shown below, and engage in research, courses, and activities up to that point.

The following is an overview. For more detail please check the notification to the target person and the related forms.

(1) QE1 (Basic abilities as WISE Ph.D. holders) requirements

In order to take QE1, students must have the expectation of passing the final defense of the master's thesis in their departments and acquire 8 credits or above in total from the following courses.

TUAT Collaboration Basic Courses	2 credits or above
Basic Courses for Industry-Government-Academia Collaboration	2 credits
Courses for International Training	2 credits or above
Special Courses for TUAT Co-Creation	2 credits or above

* Students wishing to complete the program in a shorter period can consult with us.

(2) Goals and conditions of QE1

Goals to accomplish

QE1 is a midterm evaluation in WISE program. The student must establish a foundation as a leader, with a combined foundation in agriculture and engineering, insight, and high-level research capabilities in a specialized field, as well as innovation-generation abilities, international deployment abilities, and human abilities.

Requirements to pass the QE1

The student must have an understanding of various scientific and technical domains and an appreciation of diversity, a foundation for social implementation abilities and international deployment abilities achieved through practical education making active use of industry-government-academia collaboration and overseas partnerships, and the ability to understand a specialization and fields related to it.

Eligibility

Students who are expected to pass the master's thesis defense in their own major and to acquire the minimum credits (8 credits) required for the WISE program.

Time of evaluation

1–2.5 years after the start of P1. Depending on the completion time of the master's thesis, conducted in January-February or July-August in principle. Students can choose the timing if they need to be conducted after completion of the master (2 to 2.5 years later) or they complete in short-term (within less than one year).

Contents

1. Document screening (created either in English or Japanese)
2. Presentation screening (half or more of the presentation and Q&A must be done in English)

Evaluation

Evaluation is performed from the achievements, competency and goals/planning.

Competency evaluation include the following two points:

1. Numerical quantification, based on grades, of the competency in the courses (70%).
2. Observation and evaluation by multiple people, including self-evaluation, advisor, WISE professors, and WISE appointed professors (30%).

Documents to be submitted

1. Report for QE1 (Form 2) * The form is available in the shared Google Drive for downloading.
2. Portfolio document (PDF)

Others

- The date, time, and venue of QE1 will be determined by the WISE Program Committee, and will be conducted jointly and openly within the WISE Program (participants from outside will be required to submit a confidentiality agreement).
- Chair of the screening committee will be a committee member of the WISE Program Committee.
- Judges will refer to the submitted documents, the presentation and interview, and the result of the observation evaluation.
- After the QE1, the chair will report the results to the director of WISE Program Committee using Form 3.

(3) QE2 requirements (Examination of abilities as WISE Ph.D. holders)

In order to take QE2, students must have the expectation of passing the final defense of the doctoral thesis in their departments and have acquired 2 credits or more in total from the following courses.

Advanced Courses for TUAT Co-Creation and Industry-Government-Academia Collaboration	1 credit or above
Advanced Exercise for TUAT Co-Creation and Industry-Government-Academia Collaboration	1 credit or above

* Students wishing to complete the program in a shorter period can consult with us.

(4) Goals and conditions of QE2

Goals to accomplish

The student must be a leader with expertise/specialty through agri-engineering collaboration, insights in the core specialized field, the ability to independently carry out researches and projects, and international deployment abilities and human abilities with the diversity mindset.

Requirements to pass the QE2

The student must have an understanding of various scientific and technical domains and an appreciation of diversity, social implementation abilities achieved through practical research making use of industry-government-academia collaboration and overseas partnerships, the ability to deploy these abilities internationally, and the ability to achieve a big-picture understanding of specialization and related fields.

Eligibility

Students who are expected to pass the doctoral thesis defense in their own major and to acquire the minimum credits (2 credits, or 6 credits for those students who enrolled from P3) required for the WISE program.

Time of evaluation

2.5 - 3 years after the start of P3. Depending on the completion time of the Doctoral thesis, conducted in January-February or July-August in principle. Contact WISE office if the student complete in short-term (less than 2.5 years) or the student is enrolled for more than the standard years and wishes to take the examination during that time.

Contents:

1. Document screening (created either in English or Japanese)

2. Presentation screening (half or more of the presentation and Q&A must be done in English)

Evaluation

Evaluation is performed from the achievements, competency and goals/planning.

Competency evaluation include the following two points:

1. Numerical quantification, based on grades, of pertinent competency in studied courses (70%)
2. Observation and evaluation by multiple people, including self-evaluation, advisor, WISE professors, and WISE specially appointed professors (*TOKUNIN*s). (30%)

Documents to be submitted

1. QE2 Report (Form 5) * The form is available in the shared Google Drive for downloading.
2. Portfolio document (PDF)

* Other documents may be required. The details will be announced to the target students.

Others

- The date, time, and venue of QE1 will be determined by the WISE Program Committee, and will be conducted jointly and openly within the WISE Program (participants from outside will be required to submit a confidentiality agreement).
- Chair of the screening committee will be a committee member of the WISE Program Committee.
- Judges will refer to the submitted documents, the presentation and interview, and the result of the observation evaluation.
- After the QE1, the chair will report the results to the director of WISE Program Committee using Form 3.

(5) Examination period of QE 1 and 2

QE1 and 2 for the students enrolled in spring:

Early January: Receiving the applications from students

January to February. Implementation of QE1 and QE2

March: Reporting the examination results to each department

QE1 and 2 for the students enrolled in autumn:

Middle of July: Receiving applications from students

July to August: Implementation of QE1 and QE2

September: Reporting the examination results to each department

2.6 Course registration and evaluation

(1) Course registration

Students need to register the courses at the website (Google Form) announced at the beginning of the semester. Students should discuss courses to take with their major supervisor or also with their minor supervisor, plan appropriately, and complete course registration within the specified period.

Note, depending on the course, you will need to enroll/register separately from the above. Therefore, carefully collect the registration information from the orientation guidance and/or the email notifications given at each academic year for details.

If there should be some error in registration, please inquire with the WISE Program Office later mentioned in section 6 of this guideline.

(2) Grades

1. Grading criteria

S, A, B, and C are treated as passing, and credits are awarded. D is non-passing.

2. Checking grades

If you have any questions or other issues regarding your grades, inquire with the WISE Program Office later mentioned in section 5.

2.7 Credit (Transfer) application

Courses with * mark in the list 2.2 and 2.4 are applicable (transferable) as WISE credit after the prescribed procedure.

In order for the credit(s) to be granted, the required competencies for each course (refer to the list of competencies) must be fulfilled, and the requirements for each course (number of lectures, goals) must be met. Complete the prescribed procedure by the end of February of the fiscal year to surely impart credit.

For details, please refer to the "Guidelines of Credit Transfer" provided separately.

[The procedure for credit application /transfer]

(1) Submit the "Form 7-1 TUAT-WISE Credit Transfer Application Plan（単位申請計画書）" Submit the Form 7-1 by 2 weeks prior to the activity. If it is difficult to submit before the 2 weeks, consult with the lecturer of the course. Also, feel free to contact the lecturer and/or WISE office in case you have any question during the planning.
(2) Consult with the lecturer of the course beforehand
(3) Conduct the activity
(4) Submit the "Form 7-2 TUAT-WISE Credit Transfer Application & Report（単位申請兼実施報告書）"
(5) Report and presentation on the activity content. Basically, the presentation will be scheduled during the WISE student seminar to share and exchange with all WISE students.

2.8 Sharing with WISE forms

All the forms and documents required for WISE program can be obtained from the shared folder.

To access the folder, login using your TUAT-ID and its password.

WISE office registers students to share, download and/or read them, so if you cannot open the folder, contact WISE program office.

• Forms and documents for download use
"WISE-TUAT_Data Share_Download_ダウンロード資料共有"

https://drive.google.com/drive/u/0/folders/0AC8xsQP3eU3bUk9PVA

• Forms and documents for viewing only
"WISE-TUAT_Data Share_Just for Seeing_閲覧のみデータ共有"

https://drive.google.com/drive/u/0/folders/0ADpLE4Tv9g8NUk9PVA

3. Financial Support for Students' Proposing Activities

The WISE Program has the following expense supports so that students can actively take on the research and projects aimed at by this program. Please consult with your academic advisor when applying. Students should take initiatives in planning and implementing, and if they receive support, they are supposed to submit reports to the program. They also need to record the activities in the portfolio system described later.

① Proposal-based Project

WISE Program supports expenses for individual students' research activities such as trip and other fees for participating overseas and domestic conference, overseas study, research-related events, on-site field survey, and expense for paper submission including English correction, internships as research practices etc. Purchasing consumables, annual membership fee for academic society, and RA expenses are excluded. You need to make a proposal, apply, and be adopted after the screening.

② Cross-disciplinary Cooperative Creation Project

After the selection, WISE Program supports expenses for joint interdisciplinary research projects among WISE student(s) with different specialties in and outside of TUAT so that they further develop their own research. The collaborators should be individuals or groups in and outside of TUAT and thus even single WISE student can apply. You need to form a team from different specialized fields, make a proposal, apply, and be adopted after the screening.

③ RA (Research Assistant) expenses

WISE Program supports RA expenses that you will pay to yourself for conducting research activities. You need to apply and be adopted in the screening. This expenditure does not employ other persons.

4. Special evaluation

Apart from the regular courses in WISE Program, we will grant credits or evaluate competencies for the following activities in order to encourage students to become outstanding global PhD holders in order to encourage them.

(1) Extended WISE Seminar I, II, and III

If the students voluntarily engaged in input-based learning activities such as attending seminars and lectures that have academic significance, we will evaluate them and grant credits and competencies as the course "Extended WISE Seminar", based on the application from students. Application procedures and evaluations can be done on the portfolio system described below. Details will be provided separately.

The regular courses offered in each department are not applicable to this course application. The earned credits or competency evaluation obtained in these courses cannot be counted in requirements for QE completion of the WISE Program, or observation evaluation that is examined in QE. Those credits and competencies are referred as additional information.

[Examples of targeted seminars]

- WISE Seminars
- Lectures or e-learning which will be announced accordingly

(2) Voluntary activities (tentative title)

Apart from research activities (paper publication, presentations at academic conferences, etc.), if the students voluntarily engaged in output-based activities such as those to exert their specialty, project management, or practical activities, we will evaluate obtained competencies based on the application from the student (credits will not be given).

Application procedures and evaluations can be done on the portfolio system described below. Details will be provided separately.

[Examples of activities]

- Volunteer activities at NGOs/NPOs
- Workshop facilitation
- Participation in and operation of robot contest
- Management and planning of youth associations
- TA/RA (teaching work)
- Part-time teacher
- Exhibition of your work
- Information transmission related to science and culture, commentary
- Start up and entrepreneurial activities, etc.

5. Portfolio system

The portfolio system for education is a system that records various learning, research outcomes and activities of the students, and allows them and faculty members to share and utilize the learning process, growth and educational effect.

Students can utilize this system by accumulating their actions and learning and objectively understanding them to identify their current position with respect to their goals, confirm necessary elements, and modify strategies for achieving them. In addition, they can use those records in such as resume or CV to appeal externally what kind of knowledge, experience, technology and evaluation you have received.

The WISE Program introduced this portfolio system to share the students' progress and achievements in the WISE courses and to make the observation evaluation, competency evaluation (see "1.4 Visualization of learning through competency evaluation") and special evaluation, etc. on this system.

Since this portfolio system can be accessed from off-campus via such as smartphones, students can check and reflect effectively how your experience in this program has led to your own growth anytime.
The details will be announced later.

6. Inquiries

If you have any questions about the course of study, please address your inquiry to one of the following contacts.

[WISE Program Office]

- Fuchu
  Global Information Office, 1F, Main Building
  Tel.: 042-367-5615/ 5618 (Kurihara, Shibata, Ozaki)
- Koganei
  Room 403, Building 13
  Tel.: 042-388-7773 (Kurihara)

[Specially appointed faculty members (*TOKUNIN*) for WISE Program]

- Sakae Shibusawa (Part time) sshibu@cc.tuat.ac.jp
- Hirokazu Ozaki (Mainly in Fuchu) ozakihirokazu@go.tuat.ac.jp
- Kenji Kurihara (Mainly in Koganei) k-kurihara@go.tuat.ac.jp

[Administration staffs for WISE Program]

- Reina Shibata (Fuchu GIO) fw2365@go.tuat.ac.jp
- Kozue Mukai (Fuchu GIO) kmukai@m2.tuat.ac.jp
- Shintaro Motozawa (Fuchu • Educational Support Office) kkikaku1@cc.tuat.ac.jp
- Riseko Takasaki (Koganei Student Support Office) tkkyomu1@cc.tuat.ac.jp

Appendix

(1) Partner Organizations

Ten partner organizations and fields

Kubota Corporation	AI agricultural machinery, ICT agriculture, robots
Aeon Agri Create Co., Ltd.	Agricultural production management, distribution, weather data
Shimadzu Corporation	Measurement systems, image big data
Japan Agricultural Corporation Association	Agricultural management surveys and research, smart agriculture
TAMA (Technology Advanced Metropolitan Area) Industrial Vitalization Association	Industry-academia collaboration, research and development support
Leave a Nest Co., Ltd.	Development of problem proposal abilities, agribusiness
Recruit Career Co., Ltd.	Doctoral capabilities, doctoral career placement systems
Jissen Women's University	Specialized education in nutrition science, development of women in the sciences
AgVenture Lab	Agriculture & Food, Life & Community, Technology & Innovation
Tokyo Electron Limited	Development, manufacturing and sale of electric devices

Nine overseas partner universities and type of collaboration

Oxford University	Mutual exchange, international workshops
ZALF Germany	Mutual exchange, international joint research
ATB Germany	Mutual exchange, international joint research
University of Bonn	International joint research, student exchange
Gadjah Mada University	Double degrees, overseas training programs
Vietnam National University of Forestry	Student exchange, overseas training programs
Cornell University	Student exchange, international workshops
University of California, Davis	Double degrees, international workshops
North Carolina State University	International joint research

(2) Competency list

Subject group	Subject name	Conceptual				Human			Technical	
		Problem setting	Development of solutions	Idea generation	Big-picture thinking	Diversity	Management	Leadership	New industry creation	Practical action
I. Basic Subjects for TUAT Co-Creation	Diversity Communication			1	1	1	1	1		
	Outline of Life Science	1				1			1	
	Outline of Data Science	1	1	1	1				1	
II. Basic Subjects for Industry-Government-Academia Collaboration	Outline of Creation of New Industries		1				1		1	
	Seminar for Creation of New Industries		1				1		1	1
III. Subjects for International Training	Outline of Global Leadership I	1	1	1	1	1	1	1		1
	Outline of Global Leadership II	1	1	1	1	1	1	1		1
	International Workshop			2		2		2		2
IV. Special Subjects for TUAT Co-Creation	Practical Training in Domestic and Overseas I		2			2		2		2
	Practical Training in Domestic and Overseas II		2			2		2		2
	Exercise for Data Science	1	1	1	1				1	1
V. Advanced Subjects for TUAT Co-Creation and Industry-Government-Academia Collaboration	Diversity Business Management	1		1	1	1	1	1	1	1
	Special Seminar for Creation of New Industries	1	1	1	1	1	1	1	1	1
VI. Advanced Excerceise for TUAT Co-Creation and Industry-Government-Academia Collaboration	Special Project for Creation of New Industries	1	1		1		1		1	1
	Overseas Internship I				1	1	1	1		1
	Overseas Internship II				2	2	2	2		2

(3) Syllabus

See also SPICA.

Ⅰ. Basic Courses for TUAT Co-Creation

Course Name: Diversity Communication

Overview

In this course, students will acquire the knowledge and abilities required of members involved in international collaborative research projects in a global society that includes diversity.

The following contents will be studied practically through the background, related factors, and actual cases of researchers and coordinators regarding the actual situation of international collaborative research.

1. understanding of the background and structure of international joint research projects
2. understanding of the elements included in the ability to coordinate within a diverse project team
3. the ability to coordinate and communicate as a researcher
4. ability to build multicultural and interdisciplinary relationships and coordinate issues

This course is offered jointly with "Multicultural communication and transmission" in the Graduate School of Agriculture and "Global Coordination" in the Graduate School of Bio-Applications and Systems Engineering (BASE). 3rd semester.

Standard of achievement

1. to acquire the knowledge and thinking skills necessary to gain a bird's eye view of the role and current status of international joint research projects, and to become aware of and utilize one's own expertise to solve various problems at home and abroad.
2. to acquire the analytical, reflective, and expressive skills necessary to take the initiative in solving problems in a variety of fields, both domestic and international, and to take part in multidisciplinary and multicultural collaborations.
3. to acquire the problem-seeking, planning, and practical skills necessary to become a leader who has a broad perspective and practices problem-solving

Acquisition competencies (The number of competencies gained in case of grade A)

Problem setting	Development of Solutions	Idea generation	Big-picture thinking	Diversity	Management	Leadership	New industry creation	Practical action
		1	1	1	1	1		

Class content

*The following schedule is subject to change depending on the number of students and availability of outside lecturers.
The location is Room 22, Bldg. 2, Fuchu Campus.
From October 5 to November 30, every Thursday (13:00-14:30).

1. What is an international joint research project?
2. Communication theory
3. Intercultural studies, understanding diversity
4. Sites of international collaborative research in the field of agriculture
5. Sites of international joint research in the field of engineering
6. Current status of international joint research projects in the field of interdisciplinary research
7. Introduction of cultural and interdisciplinary research in various fields (1)
8. Introduction of cultural and interdisciplinary research in various fields (2)
9. Introduction of cultural and interdisciplinary research in various fields (3)

*In principle, classes will be conducted in English.

(Supplemental)
The following classes will be offered in addition to the above as "Intercultural Communication Studies" courses offered by the Graduate School of Agriculture. By completing the following classes and submitting a report, students can apply for credit as an "Extended WISE seminar (1 credit)".
Please check this course guide for information on WISE classes.

Every Thursday for 3rd period (13:00-14:30) from December 14 to February 1. (except 12/28 and 1/4)
10. Ability to build multicultural and interdisciplinary relationships and coordinate issues
11. Possibility of interdisciplinary research
12. Approaches to international issues (1)
13. Approaches to international issues (2)
14. Approaches to international issues (3)
15. Presentation and summary

Prerequisites, related information
Required course for all Master students. Open for transferred Doctoral students
Texts, textbooks
PowerPoint slides and handouts
Reference books
None specified.
Grading method
Discussion participation 50%, Reaction paper 20%, Presentation 15%, Report 15

A word from the teaching staff
Please actively participate in the discussion.
Keywords
International Society, R&D, Projects, Coordination, Diversity
Office hours
Please make an appointment with the instructor via email. (horikiri@go.tuat.ac.jp)

Course Name: Outline of Life Science

Overview

To lead a fulfilling life while being active in society, participants will gain knowledge about life events, career, work-life balance, nutrition, etc., to develop the ability to design their own career, life, and lifestyle, as well as the ability to manage a team where diverse ways of working are possible.

First, students will attend lectures on work styles in academia and business, learn about issues and institutions, and think about the ideal work styles of the next generation. Next, they will gain a scientific understanding of childbirth and childcare, which they and their colleagues may experience, and gain knowledge and preparedness for life events for both men and women. Furthermore, focusing on dietary habits, students will understand what to keep in mind at each life stage from the viewpoint of nutrition and dietary education, and cultivate the ability to communicate this to others.

This course will be offered in the second semester in cooperation with the Women's Future Development Organization of TUAT and Jissen Women's University. Language will be English or Japanese depending on the instructor (English support will be provided for lectures in Japanese).

Standard of achievement

- To gain knowledge about work-life balance and doctoral careers, and to have your own ideas about it.
- Deepen academic knowledge of "human life" such as childcare and nutritional education

Acquisition competencies (The number of competencies gained in case of grade A)

Problem setting	Development of Solutions	Idea generation	Big-picture thinking	Diversity	Management	Leadership	New industry creation	Practical action
1				1			1	

Class content

*The titles are tentative. The dates under adjustment will be announced to the registered students as soon as they are determined.

1st-2nd Work-life balance, doctoral career
3rd-8th Childcare, developmental studies, nutrition education, etc. (to be taught by lecturers from Jissen Women's University, a partner institution)
Report Submission

*Language will be English or Japanese depending on the instructor (English support will be provided for Japanese lectures).

Prerequisites, related information

Required elective for Master students and transferred Doctors
(Students who have already taken this course may also attend.)

Texts, textbooks
Introduced accordingly as needed.
Reference books
Introduced accordingly as needed.
Grading method
Lecture participation and attitude 70%, Report 30%
Keywords
PhD career, diversity, work-life balance, childcare/developmental studies, nutrition education
Office hours
Respond accordingly.

Course Name: Outline of Data Science

Overview

With the rapid progress of measuring equipment and communication technology, we can now obtain huge amounts of data in a variety of areas ranging from natural phenomena to the social activities of human beings. Data science systematizes methodologies for extracting valuable information from these vast amounts of data, and related fields cover a wide range, including mathematical statistics, information science, machine learning, and information visualization. The purpose of these lectures is for beginners in data science to learn the methodologies of the field by gaining a broad overview of everything from data preprocessing to the basics of machine learning (both unsupervised and supervised). This class also introduces the latest trends in machine learning in order to direct students' interest toward the ever-evolving technology of data science.

This course starts in the Autumn semester. Students need to take this course in the same semester of "Exercise for Data Science".

Standard of achievement

・Understand the basics of data science

・Understand the basic methods of machine learning (unsupervised and supervised)

Acquisition competencies (The number of competencies gained in case of grade A)

Problem setting	Development of Solutions	Idea generation	Big-picture thinking	Diversity	Management	Leadership	New industry creation	Practical action
1	1	1	1				1	

Class content

The course will be offered almost every other Saturday afternoon from October 21 to December 16.
(held on alternate weeks with the " Exercise for Data Science ")

1st session) Introduction: Data science and machine learning
2nd session) Data science fundamentals: Data Acquisition
3rd session) Data science fundamentals: Data preprocessing
4th session) Unsupervised learning: Clustering, dimensionality reduction
5th session) Supervised learning: Linear regression
6th session) Supervised learning: Support vector machines, decision trees
7th session) Supervised learning: Neural networks
8th session) Future of data science

Prerequisites, related information

Required elective for Master students and transferred Doctoral students
Must have mastered fundamentals of linear algebra and mathematical statistics.

Texts, textbooks

Handed out when appropriate.

Reference books

Introduced as appropriate.

Grading method

General evaluation based on grades on mini-tests during lectures and report assignments.

A word from the teaching staff

It is hoped that students will master the basics of data science, and apply them to your actual research

Keywords

Data processing, machine learning

Office hours

As appropriate

II . Basic Courses for Industry-Government-Academia Collaboration

Course Name: Outline of Creation of New Industries

Overview

(Purpose)

Students obtain basic knowledge for creating new fields and social implementation from their research expertise. They consider the future development of their research from the viewpoints of agricultural-engineering collaboration, diversity, and the creation of new industries.

(Overview)

Lectures on how to formulate research concepts and procedures for conducting research in each phases of basic research → applied research → practical application development. If the research theme does not reach to practical application and/or development due to its characteristics, the students are encouraged to envision a new field creation; from a basic research to an academic transformation. Workshop-style classes will be conducted for students who are beginning research to construct their idea based on their individual research theme.

This lecture will be given as an intensive course in June and July. The schedule will be announced as soon as it is decided.

(Schedule)

14:45~18:00, June 6, 13, July 4, 11, Face-to-face, Fuchu (Multi-purpose room, Build.2) or Koganei (L1342) by the session.

Achievement Criteria

Students are expected to acquire the basis for developing conceptual and step-by-step implementation skills for the future based on one's own research theme. We hope students to have ideas of what is really required, what are the challenges, and what should be done to implement the results of their own research in society.

Acquisition competencies (The number of competencies gained in case of grade A)

Problem setting	Development of Solutions	Idea generation	Big-picture thinking	Diversity	Management	Leadership	New industry creation	Practical action
	1				1		1	

Class content

(1) Preliminary study

Lecture on how to formulate research concepts and research execution procedures in each phase of basic research → applied research → practical application development. Based on the above lecture content, students consider about the steps to take to develop their own research into a practical application or to create a new field, and submit their ideas on the worksheet and template distributed in advance.

(2) Workshop

Students will present the contents of their preliminary studies and improve their research development plans through discussion among students and guidance from the instructor.

(3) Post-workshop study

Based on what you learnt in the workshop, consider again about your own research development and the steps to reach your goals, and summarize them in a report.

Prerequisites, related information

This is a required course for all WISE program students. Students are recommended to take in the first year as it is the foundation for future study in the WISE program.

Texts, textbooks

Hilary Glasman-deal, “Science Research Writing: For Native and Non-native Speakers of English”ISBN-13:978-1786347831 (World Scientific Pub Co Inc)

Reference books

Foong May Yeong“How to Read and Critique a Scientific Research Article: Notes to Guide Students Reading Primary Literature”, ISBN-13:978-9814579162 (World Scientific Pub Co Inc)
Devon D. Brewer“Essentials of Scientific Research: A Practical Guide”ISBN-13:?978-0998615400 (Evidence Guides)
Willie Tan“Research Methods: A Practical Guide for Students and Researchers”ISBN-13:?978-9811256936 (World Scientific Pub Co Inc)

Grading method

Evaluation will be based on the content of the workshop presentations and the final report.

Message from the teaching staff

To involve in society construction as a high-level Ph.D talent, please learn and consider how you develop your research.

Keywords

Research conceptualization, Agricultural and engineering collaboration, Creation of new industries, Creation of new fields, Diversity

Office hours

Arranged with the lecturer through WISE faculty.

Course Name: Seminar for Creation of New Industries

Overview

Students obtain knowledge on research development in universities and applications of the research outputs in industrial sectors, and then they acquire basic knowledge to create new fields by one's own specialized technology and to implement them in society. Students consider how they proceed their research activity.

Achievement Criteria

To develop one's own research and have one's own ideas about what is required, what are the challenges, and what should be done in order to apply the research results to society. Obtain basic knowledge to acquire the ability to conceptualize the future and ability to steadily implement step-by-step.

Acquisition competencies (The number of competencies gained in case of grade A)

Problem setting	Development of Solutions	Idea generation	Big-picture thinking	Diversity	Management	Leadership	New industry creation	Practical action
	1				1		1	1

Class content

Students learn about "the creation of new fields through the advanced research capabilities of their specialty (= creation of new industries) and social implementation of the new field" from TUAT faculty and partner companies of WISE Program. From this, students consider what perspective they should look at society, taking into account the perspectives of agriculture-engineering collaboration in order to sharpen their own research techniques and knowledge and turn them into research seeds. At the end of the each class, they further deepen their thinking through dialogue time between the participants of the class.

1	**June 7** Wed	4th period 14:45 ~16:15	**府中** 2 講 22 **Fuchu** Rm. 22, lecture hall #2	古谷哲也先生 Prof. Tetsuya Furuya
2	**June 14** Wed			澁澤栄先生 Prof. Sakae Shibusawa
3	**June 21** Wed		**小金井** 13 号館 4F L1342 **Koganei** L1342, Build. 13	鈴木丈詞先生 Prof. Takeshi Suzuki
4	**July 29** Thu			吉野知子先生 Prof. Tomoko Yoshio
5	**July 6** Thu		小金井の予定 Koganei TBD	島津製作所・篠原真先生 Prof. Makoto Shinohara, SHIMADZU CORP. (with English translation)
6	**July 13** Thu		**Zoom** @ ID886 5803 1831 and Passcode: 971602	浅井農園・呉婷婷先生 Porf. TingTing Wu, Asai Nursery
7	**July 20** Thu		**府中** 2 講 22 **Fuchu** Rm. 22, lecture hall #2	東京エレクトロン株式会社・塚本雄二先生 Prof. Yuji Tsukamoto, Tokyo Electron Ltd.
8	**July 27** Thu		**Zoom** @ ID886 5803 1831 and Passcode: 971602	株式会社クボタ・飯田聡先生 Prof. Satoshi Iida, KUBOTA Corporation

Prerequisites, related information
This is a required course for Master students. Doctoral students are also welcomed to attend and listen but no credit approved.
Texts, textbooks
Assigned based on the course content.
Reference books
Assigned based on the course content.
Grading method
Students submit short report on your opinion, impression and question after the each classes. Grading is made based on class attendance, participation attitude and the short report.
Message from the teaching staff
We hope students to know previous cases of research development in agriculture, engineering and their related fields, and how their research achievements have been applied in society. Consider as your own development of your research.
Keywords
Agriculture-Engineering collaboration, Applications and implementations of research achievements, Creation of new industries
Office hours
Arranged with the lecturer through WISE faculty.

III . Course for International Training

Course Name: Outline of Global Leadership I

Overview

This course is offered jointly with "International Communication Exercise I" (Pre-program of TUAT-Steinbeis Joint Program in Japan) by Graduate School of Bio-Applications and Systems Engineering (BASE).

This course is intended to hone students' problem-finding and problem-solving skills through fascinating, unresolved themes, to discover deficiencies in their own knowledge, to share knowledge with each other through team activities, and to hone diverse communication skills in the process. As a result, students will cultivate autonomy and develop the foundation for future self-improvement.

*This course will be held in conjunction with “Outline of Global Leadership II”.

Standard of achievement

To be a researcher on an ongoing global basis, knowledge of science is not enough; knowledge and skills in strategy and marketing in business administration are also necessary.

Through the training, students will understand the following three points by replacing the 4Ps of marketing (Product: research theme, Price: type of money (budget), Promotion: journal, Product/sales: academic society) and be able to make their own plans.

1) Redefining and understanding the current status of one's own research area or field
2) Differentiation and positioning from competing researchers and groups
3) Which conference will you present your paper at and which journal will you publish it in

Acquisition competencies (The number of competencies gained in case of grade A)

Problem setting	Development of Solutions	Idea generation	Big-picture thinking	Diversity	Management	Leadership	New industry creation	Practical action
1	1	1	1	1	1	1		1

Class content

It will be held on August 22, 23, 30, and 31. (Tentative)

1: What is the TUAT-Steinbeis Joint Program ?

Diversity and Leadership, R&D Management, Facilitation Framework

2: How to develop a marketing strategy

Environmental analysis (PEST, 3C, SWOR-TOWS, core competence)

3: Market and customer analysis

What is STP Marketing?

S: Segmentation, T: Targeting, P: Positioning

4: Tactical Considerations

4P (Product, Price, Place, Promotion)

5: Business Model Canvas (BMC)

Nine items for BMC commercialization

6: New Business Proposal

Propose business and marketing strategies in teams using business cases

7: Report

Prerequisites, related information
Required elective for Masters /Required for transferred Doctors This course must be taken with " Outline of Global Leadership II". In addition to the class and the time required to complete the assignments, students should refer to the distributed lecture materials and reference books, and prepare and review in accordance with the standard number of hours required by TUAT. If you continue to participate in the TUAT-Steinbeis Joint Program (scheduled for September 4th – 15th, etc.) after this course, you can apply for credits for the "International Exchange Workshop" in the Graduate School of Excellence Program. For details, please refer to the syllabus of the "International Workshop".
Texts, textbooks
Provided accordingly
Reference books
Provided accordingly
Grading method
Contribution to group activities, content of presentations, attitude toward the course as a whole 70% Report 30%
A word from the teaching staff
This is an opportunity to learn how to think about and conduct research, and to acquire knowledge that will be fundamental in situations where you work with business people as a PhD. Active discussion and expression of opinions are expected.
Keywords
PBL, R&D Management, Marketing, New Business, Team Management, Leadership
Office hours
The course instructor will respond based on appointments.

Training

Course Name: Outline of Global Leadership II

Overview

This course is offered jointly with "International Communication Exercise I" (Pre-program of TUAT-Steinbeis Joint Program in Japan) by Graduate School of Bio-Applications and Systems Engineering (BASE).

This course is intended to hone students' problem-finding and problem-solving skills through fascinating, unresolved themes, to discover deficiencies in their own knowledge, to share knowledge with each other through team activities, and to hone diverse communication skills in the process. As a result, students will cultivate autonomy and develop the foundation for future self-improvement.

*This course will be held in conjunction with “Outline of Global Leadership I”.

Standard of achievement

To be a researcher on an ongoing global basis, knowledge of science is not enough; knowledge and skills in strategy and marketing in business administration are also necessary.

Through the training, students will understand the following three points by replacing the 4Ps of marketing (Product: research theme, Price: type of money (budget), Promotion: journal, Product/sales: academic society) and be able to make their own plans.

1) Redefining and understanding the current status of one's own research area or field
2) Differentiation and positioning from competing researchers and groups
3) Which conference will you present your paper at and which journal will you publish it in

Acquisition competencies (The number of competencies gained in case of grade A)

Problem setting	Development of Solutions	Idea generation	Big-picture thinking	Diversity	Management	Leadership	New industry creation	Practical action
1	1	1	1	1	1	1		1

Class content

It will be held on August 22, 23, 30, and 31. (Tentative)

1: What is the TUAT-Steinbeis Joint Program ?

Diversity and Leadership, R&D Management, Facilitation Framework

2: How to develop a marketing strategy

Environmental analysis (PEST, 3C, SWOR-TOWS, core competence)

3: Market and customer analysis

What is STP Marketing?

S: Segmentation, T: Targeting, P: Positioning

4: Tactical Considerations

4P (Product, Price, Place, Promotion)

5: Business Model Canvas (BMC)

Nine items for BMC commercialization

6: New Business Proposal

Propose business and marketing strategies in teams using business cases

7: Report

Prerequisites, related information

Required elective for Masters /Required for transferred Doctors
This course must be taken with " Outline of Global Leadership I".

Texts, textbooks

Provided accordingly

Reference books
Provided accordingly
Grading method
Contribution to group activities, content of presentations, attitude toward the course as a whole 70% Report 30%
A word from the teaching staff
This is an opportunity to learn how to think about and conduct research, and to acquire knowledge that will be fundamental in situations where you work with business people as a PhD. Active discussion and expression of opinions are expected.
Keywords
PBL, R&D Management, Marketing, New Business, Team Management, Leadership
Office hours
The course instructor will respond based on appointments.

Course Name: International Workshop

Overview

(Basic course procedures)
Participants will visit overseas partner institutions of the WISE Program to discuss global issues and solutions from the viewpoints of agriculture-industry collaboration and smart society, etc., based on scientific evidence in English. Through this program, students will develop the qualities of global professionals by understanding the local situation, making comparisons with their own countries, and interacting with graduate students, faculty members, and researchers at the overseas partner institutions.
In AY2023, the program will be held in November (departure on 19 and return on 26) with visits to the Leibniz Institute for Agricultural Landscape Research (ZALF) and the Leibniz Institute for Agricultural Engineering and Bioeconomics (ATB) in Germany, which are the partner institutions. [Due to the preparation schedule, register in Spring and students enrolling in Fall 2023 will not be able to participate.]

(How to take the course by applying for credits)
As an alternative to the above, students may apply for credits if they participate in the Steinbeis Training Course (its all part including preliminary training and main program) or the China Training Course offered by the BASE department, or their other learning through courses in their own major, courses taken in other majors, and other activities equivalent to this course are also applicable if the students consider they have achieved the course content, study hours, achievement standards and gained competency in this course. For details, please refer to the "Credit Application Guidelines".

Standard of achievement

- - Deepen understanding of issues facing the world from the perspectives of agriculture-industry cooperation and creation, smart society, etc., and to develop logical thinking and explanatory skills based on scientific evidence.
- - Develop discussion skills on cutting-edge research in English
- - Develop cross-cultural communication and teamwork skills

Acquisition competencies (The number of competencies gained in case of grade A)

Problem setting	Development of Solutions	Idea generation	Big-picture thinking	Diversity	Management	Leadership	New industry creation	Practical action
		2		2		2		2

Class content

■Prior Learning
Acquire and improve skills in communication, discussion, debate, presentation, etc. in English
Research on workshop topics
Acquire basic knowledge of the history, society, and culture of the partner country, etc.
■Workshops
Attend lectures on the theme
Group discussion and group work on themes
Presentation, etc.
■Post-study
Reflection, discussion, presentation

Prerequisites, related information

Attend all pre-study, workshop, and post-study sessions.

Grading method

Working attitude 50%, attendance or absence 50%

Message from the instructor
This is a valuable opportunity to connect with overseas partner institutions with world-class research capabilities, and to discuss, investigate, and make proposals together with students and faculty members. We encourage you to take on this challenge.
Keywords
International Academic and Cultural Exchange, English Discussion, English Communication, English Presentation
Office hours
Offered by a faculty member in charge of the WISE Program.

IV . Special Subjects for TUAT Co-Creation

Course Name: Practical Training in Domestic and Overseas I

Overview

To enhance expertise and experience by engaging in discussions and actions with relevant parties with a view to applying the findings obtained through lectures and practical training at the WISE Program and research in the laboratory to real-world situations in Japan and abroad, or to social implementation of research (e.g., connection to commercialization and technology diffusion).

Specifically, the students will identify issue in the field related to their own research and examine from a broad perspective the research, technologies, and other methods that will lead to solutions, as well as deepen their understanding of the field through exchanges of opinions with those involved in the field and those with practical experience where these methods are applied, and trial implementations. The program will also develop the ability to communicate with stakeholders and to implement solutions.

By gaining practical skills and work experience as engineers and researchers in Japan and abroad, the participants will gain confidence in their ability to apply their knowledge in diverse environments and cultivate the flexibility to respond flexibly. In addition, the participants will recognize how their research fields are (or could be) utilized in the field, and utilize them to build their visions.

This course allows students to apply for credits based on their own activities. Students may apply for credit (transfer) for this course if they have their own activities, courses in their own majors, or courses taken in other majors that provide the course content, study hours, targeted achievement standards, and acquired competencies of this course. You may also take advantage of opportunities to present at academic conferences.
For details, please refer to the "Guidelines of Credit Transfer," which will be provided separately.

Standard of achievement

To integrate specialized knowledge, research results, etc. learned in graduate school with practical experience, and to clarify a sense of purpose for specialized knowledge and research.

Specific goals to be achieved are as follows

1. The students will be able to clarify issues in the application, implementation, and development of knowledge and explore the seeds of research, based on examples of how the knowledge and technologies they have learned through their studies and research have been used in real-world settings in Japan and overseas, or how their research has been implemented in society.
2. To raise awareness of safety and environmental concerns in domestic and international settings, and to take a pro-research stance on research ethics, morals, and responsibility.
3. Gain experience in discovering research needs in the real world.
4. In research and the realization of an ideal society, the student will understand the stakeholders surrounding the subject matter, and acquire communication, negotiation, and etiquette skills with these stakeholders of various cultures, generations, etc.

Acquisition competencies (The number of competencies gained in case of grade A)

Problem setting	Development of Solutions	Idea generation	Big-picture thinking	Diversity	Management	Leadership	New industry creation	Practical action
	2			2		2		2

Class content

This course consists of pre-study, implementation of practical training, and post-study report (report and presentation).

Time allocation will be based on student progress. 1-3 times: Preliminary study (gathering information, reviewing papers, writing a plan, etc.) 4 to 10 times: Practical training 11-15 times: Post-event report (report compilation, data organization, presentation, etc.) Refer to the "Guidelines of Credit Transfer" to be provided separately.
Prerequisites, related information
Required for Masters /Required elective for transferred Doctors Willingness to learn and practice in the field at home and abroad.
Texts, textbooks
None
Reference books
None
Grading method
Practical training (50%), report and presentation (50%)
A word from the teaching staff
Discoveries at sites in the field will become seeds of new research, and connect with innovation.
Keywords
Domestic and international training, conference presentations, internships
Office hours
As appropriate

Course Name: Practical Training in Domestic and Overseas II

Overview

To enhance expertise and experience by engaging in discussions and actions with relevant parties with a view to applying the findings obtained through lectures and practical training at the Graduate School of Excellence and research in the laboratory to real-world situations in Japan and abroad, or to social implementation of research (e.g., connection to commercialization and technology diffusion).
The contents and themes of this course are developed from those of “Practical Training in Domestic and Overseas I”.

Specifically, the program will identify issues in the field related to their own research and examine from a broad perspective the research, technologies, and other methods that will lead to solutions, as well as deepen their understanding of the field through exchanges of opinions with those involved in the field and those with practical experience where these methods are applied, and trial implementations. The program will also develop the ability to communicate with stakeholders and to implement solutions.
By gaining practical skills and work experience as engineers and researchers in Japan and abroad, the participants will gain confidence in their ability to apply their knowledge in diverse environments and cultivate the flexibility to respond flexibly. In addition, the participants will recognize how their research fields are (or could be) utilized in the field, and utilize them to build their visions.

This course allows students to apply for credits based on their own activities. Students may apply for credits (transfer credits) for this course if they have their own activities, courses in their own majors, or courses taken in other majors that provide the course content, study hours, targeted achievement standards, and acquired competencies of this course.
For details, please refer to the "Guidelines of Credit Transfer," which will be provided separately.

Standard of achievement

Learn practical skills and techniques, integrate them with practical experience, including specialized knowledge and research results learned in graduate school, and clarify a sense of purpose for specialized knowledge and research.

Specific goals to be achieved are as follows

1 The students will be able to clarify issues in the application, implementation, and development of knowledge and explore the seeds of research, based on examples of how the knowledge and technologies they have learned through their studies and research have been used in real-world settings in Japan and overseas, or how their research has been implemented in society.
2 To raise awareness of safety and environmental concerns in domestic and international settings, and to take a pro-research stance on research ethics, morals, and responsibility.
3 Gain experience in discovering research needs in the real world.
4 To be able to practically match research needs and seeds, and to present the results.
5 In research and the realization of an ideal society, to understand the stakeholders surrounding the subject matter, and to acquire communication, negotiation, and etiquette skills with these stakeholders of various cultures and different generations.
6 To be able to summarize the contents of the study as a report, etc., and respond appropriately to presentations and questions.

Acquisition competencies (The number of competencies gained in case of grade A)								
Problem setting	Development of Solutions	Idea generation	Big-picture thinking	Diversity	Management	Leadership	New industry creation	Practical action
	2			2		2		2

Class content

This course consists of pre-study, implementation of practical training, and post-study report (report and presentation).
Time allocation will be based on student progress.

1-3 periods: Preliminary study (gathering information, reviewing papers, writing a plan, etc.)
4 to 10 periods Practical training
11-15 periods: Post-event report (report compilation, data organization, presentation, etc.)

Refer to the "Guidelines of Credit Transfer," to be provided separately.

Prerequisites, related information

Required elective for all Masters and transferred Doctors
Willingness to learn and practice in the field at home and abroad.

Texts, textbooks

None

Reference books

None

Grading method

Practical training (50%), report and presentation (50%)

A word from the teaching staff

Discoveries at sites in the field will become seeds of new research, and connect with innovation.

Keywords

Domestic and international training, conference presentations, internships

Office hours

As appropriate

Course Name: Exercises for Data Science

Overview

This is an exercise class linked with Outline of Data Science. The Python programming language is used to carry out practical exercises relating to processing, analysis, and visualization of the data which forms the foundation of data science. In addition, students learn and develop an understanding of basic methods of machine learning (e.g., support vector machines, neural networks).

Standard of achievement

- Learn the fundamentals of python.
- Ability to process and analyze data using Python, NumPy, SciPy, and Pandas.
- Ability to visualize data using matplotlib.
- Ability to practically implement basic machine learning methods using scikit-learn.

Acquisition competencies (The number of competencies gained in case of grade A)

Problem setting	Development of Solutions	Idea generation	Big-picture thinking	Diversity	Management	Leadership	New industry creation	Practical action
1	1	1	1				1	1

Class content

1st session) Orientation, setup of programming exercise environment
2nd session) Fundamentals of Python (variables, data types, control structures)
3rd session) Fundamentals of NumPy (arrays, matrix operations)
4th session) Fundamentals of Pandas (DataFrame construction, data visualization)
5th session) Data visualization (matplotlib)
6th session) Supervised learning using scikit-learn (support vector machines)
7th session) Fundamentals of deep learning
8th session) Summary

Prerequisites, related information

Recommended for all Masters and transferred Doctors
Must take “Outline of Data Science” course before or in the same semester.
Good to have programming experience

Texts, textbooks

Handed out as appropriate.

Reference books

Books on Python programming

Grading method

In-class activities (contribution, mini-quiz): 20%
Exercise assignments to check level of understanding (40%)
Final assignment (40%)

A word from the teaching staff

It is hoped that students will master the practical techniques of data science, and use those skills in their own research.

Keywords

Python, NumPy, SciPy, Pandas, scikit-learn

Office hours

Questions will be received at any time by email.

Ⅴ．Advanced Courses for TUAT Co-Creation and Industry-Government-Academia Collaboration

Course Name: Diversity Business Management

Overview

This course is offered jointly with the "Special Lecture on Innovation Promotion IV" offered by the United Graduate School of Agricultural Science.
Day 1 Monday, November 13, 2023, 9:00 - 16:00 Online
Day 2 Tuesday, November 14, 2023 9:00 - 16:00 Online
The "Special Lectures on Innovation Promotion I-V" series are offered to first to third-year doctoral students as an opportunity to think and learn about the processes, examples, and abilities needed to connect research and science-based ideas to the real world, to initiate innovation, and to create and establish new value. The course is open to first- to third-year doctoral students.
This course is "IV" of the above.

This subject theme "Global Communication
Now is the time for research to form teams that transcend race, nationality, gender, occupation, and field, and to disseminate and develop research globally. In this lecture, you will learn the skills necessary to form and lead a team as a doctoral global leader.
This course will be conducted in English.

The WISE students belonging to the United Graduate School of Agricultural Science can receive credit for both.
If you have already taken the "Special Lecture on Innovation Promotion IV", please contact us as it will also be retroactively certified as the main course "Diversity Business Management".

In this course, students will improve the following skills to form and lead a team as a doctoral global leader and develop international communication skills in English.

- Understanding of one's leadership style and ability to adapt to a team
- Ability to explain persuasively with impact
- Ability to engage in constructive discussions with others
- Ability to work positively and comfortably with others to solve problems

Please refer to the following Curriculum Map on the University's website (three policies) as a perspective on the Diploma Policy. (https://www.tuat.ac.jp/campuslife_career/campuslife/policy/)

Acquisition competencies (The number of competencies gained in case of grade A)

Problem setting	Development of Solutions	Idea generation	Big-picture thinking	Diversity	Management	Leadership	New industry creation	Practical action
1		1	1	1	1	1	1	1

Class content

■ Lecturers & Themes
Instructor: Tim Tout (Managing Director, Hummingbird Inc.) and others
Theme: Leading & Speaking With Impact in Teams
~Designing Mindset & Behavior to Lead Teams & Achieve Positive Impact

By the end of this session, participants will be able to use innovative communication tools to design communication strategies for global business and speak persuasively to a broader, non-academic online audience.
In this class, you will be introduced to best practices for designing a more proactive and strategic approach to marketing your research and message.

■ Contents (tentative)
Session 1: Leadership and Team Basics
How to clarify your leadership style and adapt it to positively impact your team
Session 2: Head & Heart Influence
How to speak with impact - with logical and empathetic appeals

Session 3: Assertive Communication
Manage message, impact, and audience perception
Session 4: Coaching Skills for Leaders
Coaching colleagues to solve critical work problems

*Session contents are subject to be changed.

Prerequisites, related information

It is preferred that students have already taken Diversity Communications.
Required for doctoral students

Texts, textbooks

The faculty member in charge of the course will prepare it.

Reference books

Information will be provided during the lecture.

Grading method

Comprehensive evaluation will be made based on class participation, in-class presentations, comment sheets, etc.

A word from the teaching staff

Please hone the skills necessary to drive and realize innovation on the global stage. We believe that if you are willing to absorb as much as you can, you will surely broaden your horizons and benefit from our research activities.

Keywords

Diversity Management, English Communication, English Expression, Diversity, Cross-Cultural Understanding, Team Building, Team Leading, Assertive Communication

Office hours

Questions and comments will be accepted by the department in charge during class or by e-mail.
<innov@cc.tuat.ac.jp>

Course Name: Special Seminar for Creation of New Industries

Overview

Students gain a holistic understanding of how researchers create value for society and learn key skills. In particular, they learn about the mindset for value creation, customer value based on Job theory, and pitch. This course is a replacement class for Outline of Innovation 1 and Outline of Innovation 2 offered from the United Graduate School of Agricultural Sciences. Outline of Innovation is different course from Special Lecture of Innovation, so be careful.

Achievement Criteria

Based on one's own research, students understand and can plan how they bring innovation (bring significant positive impacts and value creation to social systems).

Acquisition competencies (The number of competencies gained in case of grade A)

Problem setting	Development of Solutions	Idea generation	Big-picture thinking	Diversity	Management	Leadership	New industry creation	Practical action
1	1	1	1	1	1	1	1	1

Class content

9:00～12:00, July 11
14:00～17:00, July 12
13:00～16:00, Dec. 6

This course will be offered jointly with a course "Outline of Innovation 1" and "Outline of Innovation 2" for the United Graduate School of Agr. Sci.
Students affiliating in United Graduate School of Agr. Sci. will receive credit for both.
Students who have already taken "Outline of Innovation 1&2" are approved to WISE's "Special Seminar for Creation of New Industries " as well, so let us know.

Prerequisites, related information

This is for doctoral students, a recommended course.

Texts, textbooks

Assigned based on the lecture contents, as appropriate.

Reference books

Assigned based on the lecture contents, as appropriate.

Grading method

Grading will be made based on class attendance and participation attitude.

Message from the instructor

Any researchers would consider that his/her own research is important and excellent. It is necessary to let others to understand the significance of your research.

Keywords

Bring innovation from research, Create social values

Office hours

Arranged with the lecturer through WISE faculty.

VI . Advanced Exercise for TUAT Co-Creation and Industry-Government-Academia Collaboration

Course Name: Special Project for Creation of New Industries

Overview

In order to strengthen research skills, doctoral program students make presentations and thorough discussion by 1 night stay for 2 days. There will be a mentoring from young experts from external organizations in each research areas. Students will obtain discussion skill on their research and explanation ability so that they contribute society from their research expertise by getting to know each other, deepen understanding the research of oneself, and expand research perspective. This class is planned to be held jointly with FLOuRISH in late August. We will announce as soon as details are finalized.

Achievement Criteria

Students should understand their own research and the latest achievements. They are expected to develop skills and ability to engage in in-depth discussions for them with researchers in the same and surrounding fields.

Acquisition competencies (The number of competencies gained in case of grade A)

Problem setting	Development of Solutions	Idea generation	Big-picture thinking	Diversity	Management	Leadership	New industry creation	Practical action
1	1		1		1		1	1

Class content

1 night stay- 2days on August 26 and 27, at Inter-University Seminar House in Hachioji.

Students make presentation on their research background and purpose, results and discussion, progress state, future tasks and plans based on their preparation (data examination, consideration of scope of data disclosure and presentation materials construction). Thereafter, a questions and answers are repeated with other students, young researchers assigned as mentors, and experts from external outside organization to further advance the research.

Prerequisites, related information

This is for doctoral students, required elective course.

Texts, textbooks

Assigned based on the lecture contents.

Reference books

Assigned based on the lecture contents.

Grading method

Evaluation is made by presentation content, participation to discussion, post short report.

Message from the instructor

Through discussions with researchers in surrounding fields for sufficient time, re-recognize your own research and have deeper awareness on the issue.

Keywords

Lodging for training on research presentation, discussion and expand perspective

Office hours

Offered by a faculty member in charge of the WISE Program.

Course Name: Overseas Internship I

Overview

[Purpose] The aim of the WISE Program is to nurture doctoral candidates who are active on the global stage. In this course, students experience short-term (*) study abroad or internship at an overseas organization (e.g., university, research institution, company). The aim is to improve English skills and acquire a global experience and perspective.
[Overview] Students participate in a short-term study abroad in overseas organizations. Experience of short-term study abroad or internship serves as a valuable opportunity for acquiring English skills as well as discussion skill with global perspective, and a basis for full-fledged medium/long-term study abroad.

(*)
- Study or internship abroad for 3 weeks or more.
- Or, an internship in Japan of 45 hours or more of actual work time. However, the activity has to include an international perspective and significance, which should be explained in the Application for Credit Transfer (Form 7-1).

Students are allowed to apply for credits (transferring) to this course based on their own activities. When students took the equivalent courses in their or other departments, or when students conducted activities equivalent to this course, in terms of contents, hours, and desired goals and competencies, they may apply for credit transferring to this course.
For details, please refer to the "Guidelines of Credit Transfer" that will be provided separately.

Standard of achievement

- To be able to learn in an English-speaking environment.
- To be able to introduce research, exchange opinions, and obtain information in English by taking advantage of opportunities such as short-term study abroad programs.
- To be able to carry out plans to achieve goals as a researcher in the global arena.

Acquisition competencies (The number of competencies gained in case of grade A)

Problem setting	Development of Solutions	Idea generation	Big-picture thinking	Diversity	Management	Leadership	New industry creation	Practical action
			1	1	1	1		1

Class content

The international conference or other events to be participated in is determined by students in the WISE Program through consultation with an advisor in light of each student's research plan. Students can study abroad for a short-term at an overseas organization (e.g., university, research institution, company). As pre-learning for these activities, students make preparations to improve their English abilities, and their skills for presentation and discussion in English.

1. 3 months before: Determination of activity details (entry in an international conference, negotiation with destination for short-term study abroad, submission of English abstract)
2. 2 months before: Preparation before activities (improvement of English skills, and learning relating to presentation and discussion in English)
3. 1 month before: Preparation before activities (practice for presentation in English, training for discussion in English)
4. Short-term study abroad or presentation at an international conference, etc.
5. 1 month after: Reflection on specifics of activities (communication with destination for study abroad, identification of problems)
6. Report on results (report submission and English oral presentation and exchange of views at such as WISE joint presentation seminars)

Prerequisites, related information
Required elective for both Regular Doctors & Transferred Doctors Students can apply their activity for credit to this course by applying in advance.
Texts, textbooks
Designated by advisor based on specifics of activities.
Reference books
Designated by advisor based on specifics of activities.
Grading method
Evaluated based on report, English presentation, and discussion.
A word from the teaching staff
We recommend overseas experience and short-term study abroad at overseas institutions as experience toward overseas activities.
Keywords
Short-term study abroad at an overseas institution, Presentation and Discussion in English
Office hours
Offered by a faculty member in charge of the WISE Program.

Course Name: Overseas Internship II

Overview

[Purpose] To develop human resources with doctoral degrees active on the global stage, learning and/or internship at an overseas institution are effective. In this course, students engage in medium/long-term (*) research activities or trainingat an overseas organization (e.g., university, research institution, company). Purposes include: improving English communication abilities, improving ability to engage in international research, carrying out research in English at overseas universities or other institutions, carrying out international joint research, and acquiring the ability to propose commercialization at overseas companies.
[Overview] In medium/long-term (*) study abroad at an overseas organization (university, research institution, company, etc.), students carry out international joint research, participate in related academic meetings, and participate in the international community. After returning to Japan, students continue collaborating in international joint research, and writing international co-authored papers. In internships at overseas companies or other organizations, the purpose is to promote concrete participation in business/projects, and more mature proposal abilities in English.

(*)
・Study or internship in foreign organization for 6 month or more.
・Activities with a global perspective in Japan is accepted for International students.

Students are allowed to apply for credits (transferring) to this course based on their own activities. When students took the equivalent courses in their or other departments, or when students conducted activities equivalent to this course, in terms of contents, hours, and desired goals and competencies, they may apply for credit transferring to this course.
For details, please refer to the “Guidelines of Credit Transfer” that will be provided separately.

Standard of achievement

- To be able to conduct mid- to long-term study abroad and promote research activities and international collaborative research in English.
- Participate in business activities in English during internships at overseas companies, etc.

Acquisition competencies (The number of competencies gained in case of grade A)

Problem setting	Development of Solutions	Idea generation	Big-picture thinking	Diversity	Management	Leadership	New industry creation	Practical action
			2	2	2	2		2

Class content

Students consult with their advisors regarding progress of their own research, plans for presenting results, and other issues, and engage in medium/long-term overseas study at an overseas organization (university, research institution, company, etc.) or internship at an overseas company. As preparation beforehand for these activities, students improve their ability to carry out research activities, paper writing, presentation, and discussion in English, and this makes it possible to obtain beneficial effects from these activities.

1. 6 months before: Determination of activity details (negotiation with destination for medium/long-term study abroad, negotiation with an overseas company, etc.)
2. 2 months before: Preparation beforehand for activities (improvement of English skills, and improvement of ability to engage in research activities in English)
3. 1 month before: Preparation beforehand for activities (travel-related procedures, preparation of housing and other arrangements in the local area)

4. Medium/Long-term study abroad or internship at overseas company, etc.
5. 1 month after: Reflection on specifics of activities (continued communication with destination of study abroad)
6. Research report (report submission and English oral presentation and exchange of views at such as WISE joint presentation seminars)
7. Continuation after activities: Moving forward with international joint research aimed at writing academic papers

Prerequisites, related information
Required elective for both Regular Doctors & Transferred Doctors Students can apply their activity for credit to this course by applying in advance.
Texts, textbooks
Depending on the content of the program, the supervisor and the faculty member who accepted the student for study abroad will designate the program.
Reference books
Depending on the content of the program, the supervisor and the faculty member who accepted the student for study abroad will designate the program.
Grading method
Evaluated based on reports and English presentations
A word from the teaching staff
We hope students will experience mid/long-term study abroad and carry out international joint research.
Keywords
Mid/Long-term study abroad, international joint research, internship at overseas company
Office hours
Offered by a faculty member in charge of the WISE Program.

VII . Courses for Special Evaluation

Course Name: Extended WISE Seminar I, II, and III

Overview

Apart from the regular courses of the WISE program, "Extended WISE Seminar I, II, and III" in the category of Subjects for Special Evaluation was established in order to encourage students' activities aimed at becoming outstanding global Ph.D. holders who drive the "super smart society" through the creation of new industries and diversity,

In these courses (I, II, and III), when students voluntarily engage in input-based learning activities, such as attending seminars and lectures of high academic significance, which meet the above objectives, students apply for evaluation together with the submission of the report. The faculty members in charge will evaluate the students' performance and grant credits and competencies.

Regular courses offered in students' departments are not eligible for this course. In addition, the credits and competencies earned in these courses are not included in the credits required for QE or the program completion, or the observation/behavior evaluations for QE, but will be referred to as additional information.

※ As a reference, the WISE program may provide recommended seminars that are eligible for this course.
※ Applications can be processed via the portfolio system. If you need any help in the application, just feel free to contact with specially appointed faculty members.
※ As a guide, about 12 hours in total and report making will be considered as one course (1 credit). These seminars do not have to be consecutive and their themes can be different from each other. When submitting the report, however, students should comprehensively explain what you have intended to study and acquire in those seminars and your actual acquisitions.
※The report should be approximately 1500-2000 letters in Japanese; 600-700 words in English per course and should be accompanied by supporting materials that will show the contents of the seminar and lectures. There is no specific form.
※ At the time of application, the students will be asked to indicate the competencies they believe they have gained from those activities, and the faculty members in charge will evaluate and judge based on the reports. As a result, the competencies you earn may differ from your application.

Standard of achievement

・Proactively seize opportunities other than curriculum, independently plan and implement learning activities that are consistent with the purpose of the WISE Program.

・Objectively understand the knowledge, experience, and competencies that should be developed or supplemented in your own growth strategies, and set them to obtain them as goals, and achieve them.

・Report and explain persuasively the outcome of your voluntary learning in the light of your initial goals.

Acquisition competencies (Number of competencies acquired for a grade of A)

Acquisition competencies (Number of competencies acquired for a grade of A)

Problem setting	Development of Solutions	Idea generation	Big-picture thinking	Diversity	Management	Leadership	New industry creation	Practical action

You can apply up to 5 competencies with 1 score for each

Class content

Depends on the seminars and courses.

Prerequisites, related information

None

Texts, textbooks

None

Reference books

None

Grading method

・Report contents (in some cases, an oral explanation may necessary)

A word from the teaching staff

This course is aiming at encouraging your positive extracurricular learning activities, so please join the useful seminars and lectures and reflect those opportunities to this course.

Keywords

Proactive activities, competency acquisition, strategic learning.

Office hours

For each seminar or course, please contact the respective instructor or organizer. For consultation as a subject, please consult with professors (Prof. Ohtsu and specially appointed faculty members (*TOKUNIN*)) as appropriate.

(4) Overseas business trip procedures

[Before travel]

<table>
<tr><th></th><th>Documents to be submitted</th><th>Deadline</th><th colspan="3">Submission / Document Acquisition</th><th>Remarks</th></tr>
<tr><th></th><th></th><th></th><th>Graduate School of Agriculture</th><th>Graduate School of Engineering / BASE</th><th>United Graduate School of Agriculture</th><th></th></tr>
<tr><td>1</td><td>Study abroad application</td><td>~ 2 months before departure</td><td rowspan="3">(Fuchu)
Student Affairs Section ／
http://t-board.office.tuat.ac.jp/A/menu.php#Boar
（WEB bulletin board, search for academic information tag “学外研究”）</td><td rowspan="3">(Koganei)
Student Affairs Section ／
http://web.tuat.ac.jp/~tkyomu/Tkyomu-site/tkyomu.htm
(List of documents for Faculty of Engineering)
http://www.tuat.ac.jp/base/download/
(List of documents for BASE)</td><td>Office of United Graduate School of Agriculture</td><td>Not available in the homepage of United Graduate School of Agriculture</td></tr>
<tr><td>2</td><td>Travel Notification</td><td>~ 2 weeks before departure</td><td rowspan="2">Office of United Graduate School of Agriculture ／
http://www.tuat.ac.jp/uni-grad/yoshiki/index.html
（homepage）</td><td></td></tr>
<tr><td>3</td><td>Travel pledge</td><td>~ 2 weeks before departure</td><td></td></tr>
<tr><td>4</td><td>Copy of travel overseas insurance purchase voucher</td><td>~ 3 weeks before departure</td><td colspan="3">http://web.tuat.ac.jp/~intl/ja/tuat_student/travelinsurance.html
(Homepage of TUAT International Exchange Office)</td><td></td></tr>
<tr><td>5</td><td>Written pledge regarding international trip</td><td rowspan="2">Approximate payment: ~ 2 months before departure

Settlement payment: ~ 2 weeks before departure</td><td rowspan="2">GIO</td><td rowspan="2">GIO</td><td rowspan="2">GIO</td><td></td></tr>
<tr><td>6</td><td>Notification of Going Abroad</td><td>For whom have not register yet</td></tr>
</table>

[After travel]						
1	Boarding pass	Immediately after returning	GIO	GIO	GIO	If lost, proof of boarding is required.
2	Copy of passport					A page that indicates that you have entered and exited Japan
3	Business travel report					
4	Travel Expenses Invoice					Required for rough payment.
5	Completion report					WISE Program form

Travel FAQ ***Please check the "Budget Execution" page of the TUAT-WISE website, too.**

Q. Will I receive a daily allowance?

A. Daily allowance cannot be provided to students. For domestic and international travel, travel expenses are calculated starting from Tokyo Station or Haneda/Narita airports.

Q. Will I be reimbursed for overseas travel insurance?

A. You are responsible for the cost of travel insurance.

(5) Sharing of information, forms, etc.

- You can download orientation materials, course information, various forms, and other downloadable materials from the following Google Drive " WISE-TUAT_Data Share_Download_ダウンロード資料共有".
  *You must enter with a TUAT-ID.
  https://drive.google.com/drive/u/0/folders/0AC8xsQP3eU3bUk9PVA

- The video recordings of the orientation, which are not available for download but can be viewed, can be obtained from Google Drive " WISE-TUAT_Data Share_Just for Seeing_閲覧のみデータ共有" below.
  *You must enter with a TUAT-ID.
  https://drive.google.com/drive/u/0/folders/0ADpLE4Tv9g8NUk9PVA

- Set of documents required for overseas business trip
  Varies depending on the Graduate School of Agriculture, United Graduate School of Agricultural Sciences, Graduate School of Engineering, and BASE. Normally, procedures should be completed 1.5 to 2 months prior to travel. Please check the necessary procedures carefully with your department well in advance.

- You are subscribed to the following group email (mailing list) according to your year of participation in the Graduate Program of Excellence. You are free to post to the group mail for your year. If you would like to send information to other distinguished students, please inform the specially-appointed faculty members.
  wise_st_2023-groups@go.tuat.ac.jp
  wise_st_2022-groups@go.tuat.ac.jp
  wise_st_2021-groups@go.tuat.ac.jp
  wise_st_2020-groups@go.tuat.ac.jp
  wise_st_2019-groups@go.tuat.ac.jp

(6) Equipment list

Item	Brand code	Location
Tractor	Kubota MR97QMAXWUR	Large farm equipment storehouse
Panel saw	Synchro HP1-1800	Forestry processing room
Speed-linked organic blade for tractors	Kubota CM601WD-OL	Large farm equipment storehouse
Seed drill tractor	Kubota N250-21D	Large farm equipment storehouse
Planer	Iida Industries EJ304	Forestry processing room
Band sawing machine	Audio BS-1100-5AS	Forestry processing room
JINS MEME ES_R Data measurement equipment	JINS MEME ES_R	Faculty of Engineering Bldg. 7 Room 305 (Laboratory)
Gas fire muffle furnace	1-5925-02 HPM-1G	Faculty of Engineering Bldg. 4 Room 401 (Open lab (laboratory))
Digital lock-in amplifier	LI5645	Faculty of Engineering Bldg. 4 Room 401 (Open lab (laboratory))
High Speed Refrigerated Micro Centrifuge	MX-107	Faculty of Engineering Bldg. 10 Room 114 (Student Laboratory)
Haptic feedback device	3D Systems Touch	Faculty of Engineering Bldg. 4 Room 401 (Open lab (laboratory))
Haptic feedback device	3D Systems Touch	Faculty of Engineering Bldg. 4 Room 401 (Open lab (laboratory))
Medical training system	BSLADV-W / M	Faculty of Engineering Bldg. 4 Room 401 (Open lab (laboratory))
Image analysis system	Neoc-Pro / P	Engineering Building No. 5 (Instrument Analysis) Instrument Room 4
Nanomaterial system	CADE-4T	Engineering Building No. 5 (Instrument Analysis) Instrument Room 4
AI Autonomous Driving Deep Image Analysis System		Engineering Building No. 5, Room 304A (server room)
Smart agricultural data collection system		Faculty of Engineering Bldg. 7 Room 211 (server room 1)
Shimadzu ultraviolet-visible spectrophotometer		Faculty of Engineering New Building No. 1 1N-406B Room (Laboratory)
Multimode microplates	Varioskan LUX	Faculty of Agriculture Bldg.4 Room 323 (Student Lab)
Arbosonic 3D	10 channels	Faculty of Agriculture Building No. 1 Room 314 (Laboratory)
Wood penetration resistance measuring instrument	RESI PD400	Faculty of Agriculture Building No. 1 Room 314 (Laboratory)
Soundproof room	NS NS 2.5 tatami mat Dr-40	Faculty of Agriculture Building No. 2 Room 112 (Common Equipment Room)
Water-cooled GPU calculator	RC GPU Server nami4II	Faculty of Engineering Bldg. 7 Room 211 (server room 1)
Biological reaction sub-molecule quantitative mapping system	NSVW-U Base	Engineering Building No. 5 (Instrument Analysis) Instrument Room 4
Fourier transform infrared spectrophotometer	IRSPIRIT-T	Faculty of Engineering Bldg. 10 Room 221 (Laboratory)
Compact flow cytometer	Decal water tar B4-RO-VO (1L4C)	Faculty of Agriculture Building No. 1 Room 107 (Student Lab)
Fourier transform infrared spectrophotometer	FT / IR-4600AC	Faculty of Engineering New Building No. 1 Room 1N-407 (Laboratory)
Epilog laser cutting machine	Mini24-40W	Faculty of Engineering Monozukuri Creative Engineering Center
High-definition image capture device PCI hardware	PCI SS S / W Ver9.0 and New USB SS H / W P / N: PCI017 / E	Engineering Building No. 5 (Instrument Analysis) Instrument Room 4
Animal breeding system	MH-K1600L	Faculty of Agriculture Building No. 1 Room 409 (Laboratory)

AV equipment set	RICOH PA-904	Faculty of Agriculture Lecture Room 2 Lecture 2-Room 41A (Lecture Room)
AV equipment set	RICOH PA-904	Faculty of Agriculture Lecture Building 2 Lecture Room 2-Room 42 (Lecture Room)
AV equipment set	RICOH PA-904	Faculty of Agriculture Lecture Building 2 Lecture Room 2-31 (Lecture Room)

Usage: please contact the WISE faculty member via email for the first use.

Email information:

- Title: "Request for the use of outstanding shared equipment
- To: Assistant professors for WISE Program
- Address: tuat-wise@m2.tuat.ac.jp

- Fuchu Campus

- Koganei Campus