

The University of Tokyo  
 World-leading Innovative Graduate Study Program  
 “innovations for Future Society”  
 2018 Autumn Application Guideline

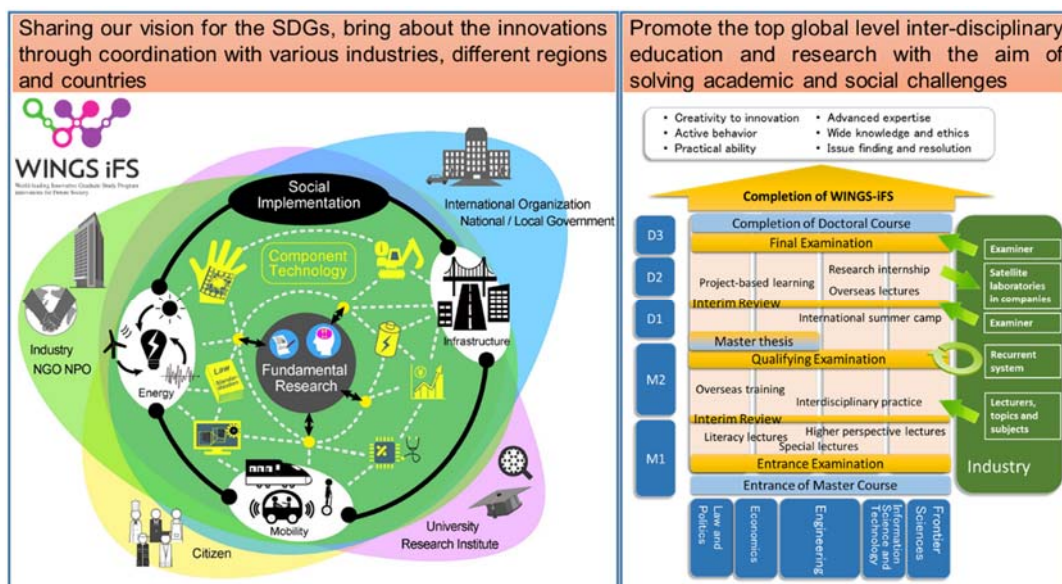


1. Educational philosophy of this program

The digital revolution - including Internet of Things (IoT), Big Data, Robots, Artificial Intelligence (AI) – is giving a great impact to the way of innovation through a paradigm shift of industrial and social structures. In addition to the traditional flow of “seed-push” innovation from fundamental research, applied research, development and verification to commercialization, a newer flow of “demand-pull” innovation is also occurring, in which a goal is set and the necessary technologies are developed based on a clear vision. As global economic and social systems change and industrial structure transforms, creating a society to be succeeded by future generations requires understanding and leadership on the way of innovation.

When considering our lives, realizing sustainable society will greatly contribute to achieving SDGs (Sustainable Development Goals). For example, even in developed countries, energy consumption for houses, buildings, automobiles, railways, etc. accounts for more than half of the whole energy consumption in the society, and at the same time, it is required to improve social affluence, toughness, productivity, health, etc. For realizing sustainable society, it is indispensable to draw a new future society, to understand social and economic value’s improvement and institutional design, and to lead new innovations with wide and diverse technological combinations and engineering supports. Therefore, innovations we are seeking needs to include organic harmony in which individual products and services have autonomous values as intelligent things, mutually influence and cooperate, and function in a whole society - in other words, it needs to realize a “holonic” harmony of concentration and dispersion, conversion and use, etc. through intelligent individuals and their networks.

Based on these backgrounds, this program mainly targets on different subjects, technologies and methodologies relating infrastructure (architecture, cities, regions, national land, etc.), mobility (electric vehicles, high-speed railways, next generation aircraft, space systems, etc.) and energy (electric power network, distributed power supply, energy conversion, energy mix, etc.) as a social common capital. This program develops human resources who will promote cutting-edge researches (including social implementation, development of advanced component technologies and deepening of basic researches), design and manage the necessary networks, bring innovations by linking technologies and their implementers, and create future industries and business.



In specific terms, the program brings research outcomes back into society and tries to solve social problems through practical implementation of industry-university collaborative projects based on the close partnerships with the world of industry, and cultivate advanced expertise and profound culture, the ability to understand different areas of expertise, and the ability to link with various experts and players. Human resources to be cultivated by this program are internationally superior “knowledge professionals” who open to the future of science and technology centered on universities where intellectuals and human resources gather, and who create the future society consisting of holonic systems and holonic processes.

## 2. Human resources this program cultivates

For creating a future society which realizes the SDGs, this program cultivates human resources who have expertise in specific fields, engage in social implementation, development of advanced component technologies and deepening of basic researches, link with various experts and implementers from industries, municipalities and international organizations, and contribute to create future industries and business through practice of innovation.

## 3. Applicable student

Any students in master’s course (1<sup>st</sup> and 2<sup>nd</sup> year) and doctoral course (only 1<sup>st</sup> year who entered in September 2018) of The University of Tokyo can apply to this program. Students who belong to Program for Leading and are planning to apply for it can also apply for this program.

Students applying for this program are asked to:

- Enter the doctorate course of our university with the aim of acquiring the doctor's degree in the specialized field related to this program,
- Understand the aim and completion requirements of this program, and
- Apply to the JSPS Research Fellow after being adopted in this program, and ensure continuing to be in this program even if adopted in the JSPS Research Fellow.

The student’s graduate school and supervisor also need to understand that the student belongs to this program.

## 4. Curriculum outline

This program integrally promotes the world’s top level research and education, in which the fields of infrastructure, mobility and energy are mainly targeted. Under this integrated master-doctoral education program, we cultivate internationally superior “knowledge professionals” beyond experts familiar with traditional specific fields. The professionals will lead to create a future society by highly integrating individual experiences and technologies accumulated. Program students will have opportunities to practically learn fields other than their own special field and to experience international internships, summer camp, etc. in the curriculum (Table 1) with the following characteristics. The credits of subjects in Table 1 are acquired by replacing from multiple existing subjects.

For the details, please refer to the website of this program (<http://ifs.t.u-tokyo.ac.jp>).

- (1) Opportunities to improve communication skills so that students are able to have expert discussions in English;
  - 3799-810 Communication Skills for Excellent Professionals, etc.
- (2) State-of-the art selected classes to acquire advanced expertise;
  - 3799-809 Management Skills for Excellent Professionals
  - 3799-811 Higher Perspectives for Management of Built Environment
  - 3799-814\_818 Energy Initiative Advanced Course I-V, etc.
- (3) Practical discussions through exercises, seminars, and studios;

- 3799-805 WINGS Seminar I
  - 3799-812 Interdisciplinary Practice for Management of Built Environment, etc.
- (4) Seminars by practitioners playing active in the front lines;
- 3799-807 WINGS Special Lecture I
  - 3799-808 WINGS Special Lecture II, etc.
- (5) Practical exercises where students obtain the ability of searching/discovering problems and proposing optimal solutions under collaboration with industries;
- 3799-805 WINGS Seminar I
  - 3799-812 Interdisciplinary Practice for Management of Built Environment
  - 3799-813 International Practice for Management of Built Environment, etc.
- (6) Multi-instructional system where faculty members from different departments join and cooperate together;
- 3799-812 Interdisciplinary Practice for Management of Built Environment, etc.
- (7) Substantial internship program that students work with practitioners together using satellite laboratories in companies;
- 3799-806 WINGS Seminar II
  - 3799-813 International Practice for Management of Built Environment, etc.
- (8) Summer camp to discuss international collaborative research proposals etc. with doctoral students of the world's top universities.
- 3799-813 International Practice for Management of Built Environment, etc.

Table 1 Subjects and credits

Subjects	Credits	Type	備考
3799-805 WINGS Seminar I	2	Compulsory elective	In order to complete this program, you must meet the completion requirements of your department and obtain 12 credits or more from subjects listed on the left.
3799-806 WINGS Seminar II	2		
3799-807 WINGS Special Lecture I	2		
3799-808 WINGS Special Lecture II	2		
3799-809 Management Skills for Excellent Professionals	2		
3799-810 Communication Skills for Excellent Professionals	2		
3799-811 Higher Perspectives for Management of Built Environment	2		
3799-812 Interdisciplinary Practice for Management of Built Environment	2		
3799-813 International Practice for Management of Built Environment	2		
3799-814 Energy Initiative Advanced Course I	2		
3799-815 Energy Initiative Advanced Course II	2		
3799-816 Energy Initiative Advanced Course III	2		
3799-817 Energy Initiative Advanced Course IV	2		
3799-818 Energy Initiative Advanced Course V	2		
3799-295 International Special Lecture I	2		
3799-296 International Special Lecture II	2		
3799-297 International Special Lecture III	2		
3799-298 International Special Lecture IV	2		

## 5. Completion requirements

- (1) Students in this program must take 12 credits or more in total in Table 1 during the regular master's/doctoral courses. By acquiring credits of existing subjects which can be replaced, the credits in Table 1 will be certified.
- (2) Students must take and pass the QE (Qualifying Examination), FE (Final Examination) and IR (Interim Review) of this program.
- (3) Students must fulfill the required credits for the master's/doctoral courses and pass those thesis examinations.

## 6. Schedule of selection and procedures for submission

The schedule (planned) is as follows.

- October 9, 2018 Guidance
- October 16, 2018 Submission deadline for application form
- October 23, 24 and 25 Interview
- October 29, 2018 Announcement of passed students

The application form can be downloaded from the website of this program. Please fill out the necessary items in the application form. The application form (1 original and 2 copies) must be submitted via internal mail to the below address by the deadline of submission.

(Address)

7-3-1, Hongo, Bunkyo-ku, 113-8656

Graduate School Team, General Affairs Office, School of Engineering Building #8, The University of Tokyo

Phone: 03-5841-7747

## 7. QE (Qualifying Examination), FE (Final Examination) and IR (Interim Review)

- QE will be conducted around the end of the master's course and the beginning of the doctor's course. From the viewpoints of research accomplishment ability, quality to overlooking and motivation, and appropriateness for this program, studying history of this program are confirmed, and oral questions on research papers and projects outcomes including research background and motivation are carried out.
- FE will be held at the completion of doctoral course. The completion of this program requirements is confirmed and interview examination is conducted from the viewpoints of human resource image to be cultivated.
- IR is an intermediate examination conducted prior to QE and FE, in accordance with QE and FE.

## 8. Grant

- Students of this program can apply for the original grant (planned 180,000 JPY per month).
- After about half a year from the start of the program, we confirm the research progress and the status of class credits of the student, examine the grant application that the student applies, and decide the grant support based on the results.
- The grant is for both master's course students and doctoral course students.

## 9. Implementation organization

[Representative Graduate School (Department)]

- Graduate School of Engineering (Department of Civil Engineering, Department of Architecture, Department of Urban Engineering, Department of Mechanical Engineering, Department of Electrical Engineering and Information Systems, Department of Materials Engineering)

[Other Graduate School (Department), Institute, Center, etc.]

- Graduate School of Engineering (Department of Precision Engineering, Department of Aeronautics and

Astronautics, Department of Systems Innovation, Department of Applied Chemistry, Department of Chemical System Engineering, Department of Nuclear Engineering and Management, Department of Bioengineering, Department of Technology Management for Innovation)

- Graduate School of Information Science and Technology
- Graduate School of Frontier Sciences
- Graduate Schools for Law and Politics
- Graduate School of Economics
- Institute of Industrial Science
- Research Center for Advanced Science and Technology
- Research into Artifacts, Center for Engineering
- Center for Spatial Information Science

#### 10. Contact office and professors

- GMSI office, Graduate School of Engineering [office@gmsi.t.u-tokyo.ac.jp](mailto:office@gmsi.t.u-tokyo.ac.jp)
- Graduate School Team, General Affairs Office [daigakuin.t@gs.mail.u-tokyo.ac.jp](mailto:daigakuin.t@gs.mail.u-tokyo.ac.jp)
- Yasuyuki YOKONO, Project Professor  
Department of Mechanical Engineering, Graduate School of Engineering
- Yasunori AKASHI, Professor  
Department of Architecture, Graduate School of Engineering