



BACHELOR'S PROGRAM IN GREEN SCIENCE

DEPARTMENT OF MATERIALS AND LIFE SCIENCES

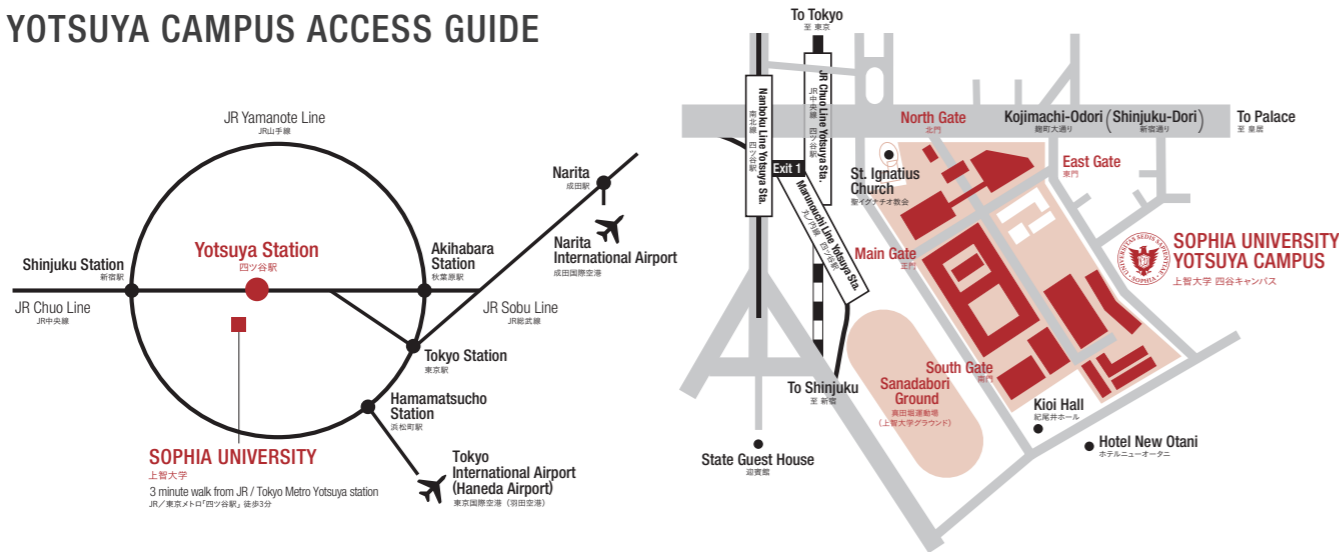
グリーンサイエンスコース 物質生命理工学科

BACHELOR'S PROGRAM IN GREEN ENGINEERING

DEPARTMENT OF ENGINEERING AND APPLIED SCIENCES

グリーンエンジニアリングコース 機能創造理工学科

YOTSUYA CAMPUS ACCESS GUIDE



FACULTY OF SCIENCE AND TECHNOLOGY SOPHIA UNIVERSITY

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FACULTY OF SCIENCE AND TECHNOLOGY, SOPHIA UNIVERSITY 上智大学 理工学部



PREPARING YOUNG TALENT TO BECOME NEXT-GENERATION SCIENTISTS AND ENGINEERS IN GLOBAL COMMUNITY



FACULTY OF SCIENCE AND TECHNOLOGY

The Faculty of Science and Technology aims to provide students "cross-disciplinary knowledge" that integrates "science" and "technology." With its motto being "human and environmental support," the Faculty seeks to produce graduates who are able to take active steps toward realizing human societies that thrive in harmony with nature. It aims to nurture in students the ability to adapt to today's knowledge-based societies. To this end, the Faculty is made up of the following three departments:

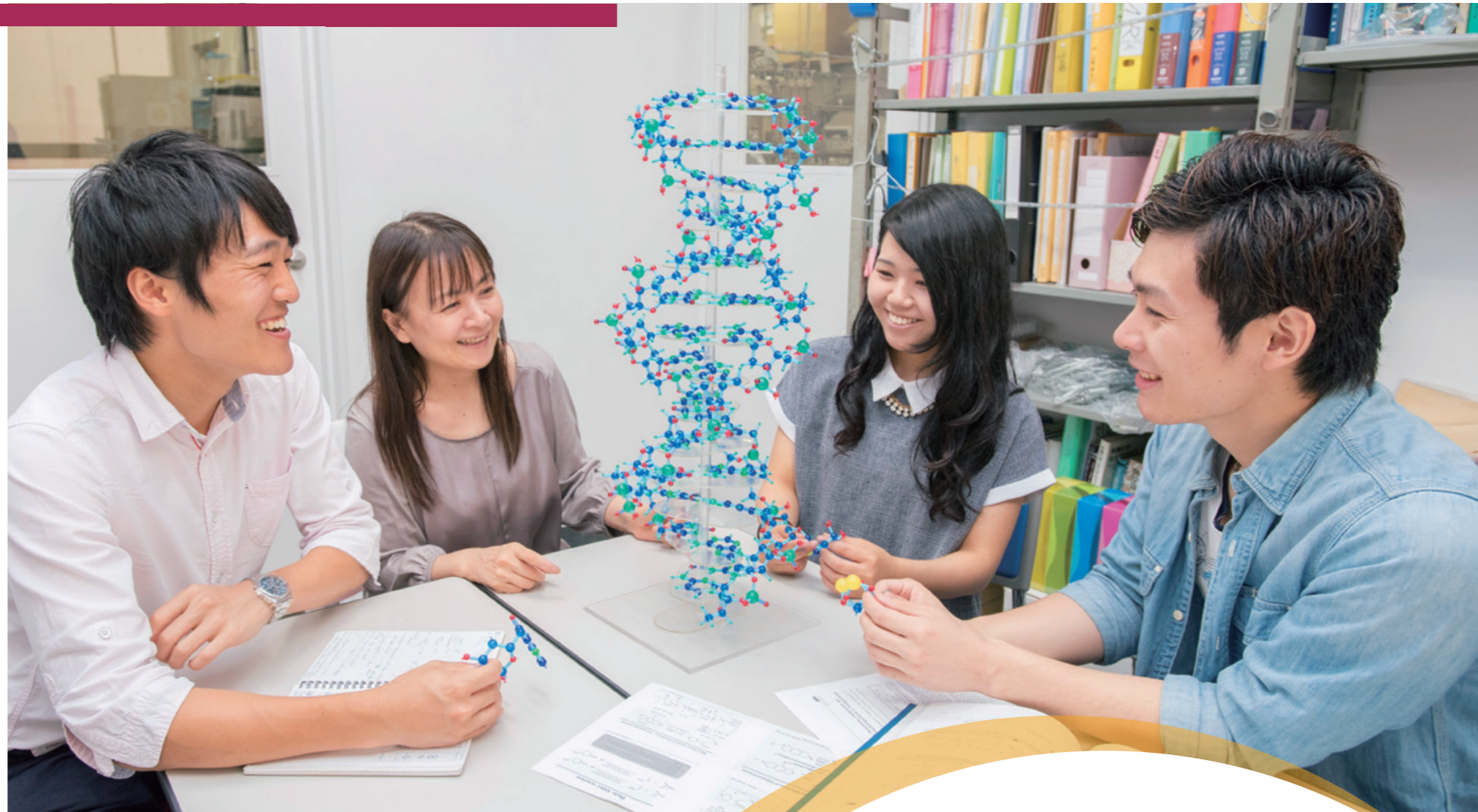
- 1 Department of Materials and Life Sciences
- 2 Department of Engineering and Applied Sciences
- 3 Department of Information and Communication Sciences

Each department offers a variety of unique educational programs. The Department of Materials and Life Sciences aspires to impart to students "new and innovative ways to view materials that are in harmony with nature;" the Department of Engineering and Applied Sciences endeavors to teach students "ways to create materials and devices that will greatly benefit both global and human environments;" and the Department of Information and Communication Sciences seeks to offer students "an in-depth understanding of human and society through information."

本学理工学部は、「理学」と「工学」の融合による「複合知」を習得し、「人間・環境支援」をモットーとして、自然環境と調和した人間社会の実現に向けて積極的に取り組み、また知識基盤社会に適応できる学生を育成するため、下記の3学科で構成されています。

- 1 物質生命理工学科
- 2 機能創造理工学科
- 3 情報理工学科

物質生命理工学科は「自然と融和した新しい物質観と生命観の教授」、機能創造理工学科は「地球環境や人間環境への貢献に資する“もの”を実現(創造)する叡智の教授」、情報理工学科は「“情報”を通して人間と社会に対する深い理解力の教授」を特色とした教育を行います。



MESSAGE FROM THE DEAN

MASAHIRO RIKUKAWA Dean of the Faculty of Science and Technology

This year marks the sixth year since we began offering the Green Science Course and the Green Engineering Course in which classes are conducted in English for international students and others. Both courses have attracted students from many countries and regions, thereby realizing a highly diverse environment for education. Graduates of the first and second batches were able to pursue a wide variety of careers. In the autumn semester of

2013, the Green Science and Engineering Division of the Graduate Program of Science and Technology was started in which classes and dissertation guidance are conducted entirely in English. A large number of graduates from the English Course go on to this graduate program along with university graduates from other countries.

One of the features of the English Course is small-group instruction. In the Green Science Program, based on the curriculum of the Department of Materials and Life Sciences, students learn the fundamentals of chemistry, applied chemistry, physics, and biology in their entirety, thereby acquiring cross-disciplinary knowledge. By the same token, in the Green Engineering Program, based on the curriculum of the Department of Engineering and Applied Sciences, students learn the fundamentals of physics, mechanical engineering, and electrical/electronic engineering. Students in their senior year carry out undergraduate research and are able to gain mastery of science and engineering by leveraging the results of basic studies that they achieved. On top of these, international students engage in undergraduate research, student experiments, and other activities with Japanese Program students in many cases, giving them firsthand exposure to Japanese student culture.

Despite being situated in the center of the giant Tokyo metropolis, almost all the faculties and graduate school courses of arts and sciences at Sophia University are consolidated in one location, forming a single yet diverse society. We hope you understand our mission, "Sophia - Bringing the World Together", and look forward to having you with us in the near future.



GREEN SCIENCE PROGRAM AND GREEN ENGINEERING PROGRAM

To meet the diverse needs of internationalization, the Faculty added two new programs taught entirely in English as part of its regular curriculum in September 2012. The Green Science Program offered by the Department of Materials and Life Sciences and the Green Engineering Program offered by the Department of Engineering and Applied Sciences each have an enrollment capacity of 25 students.

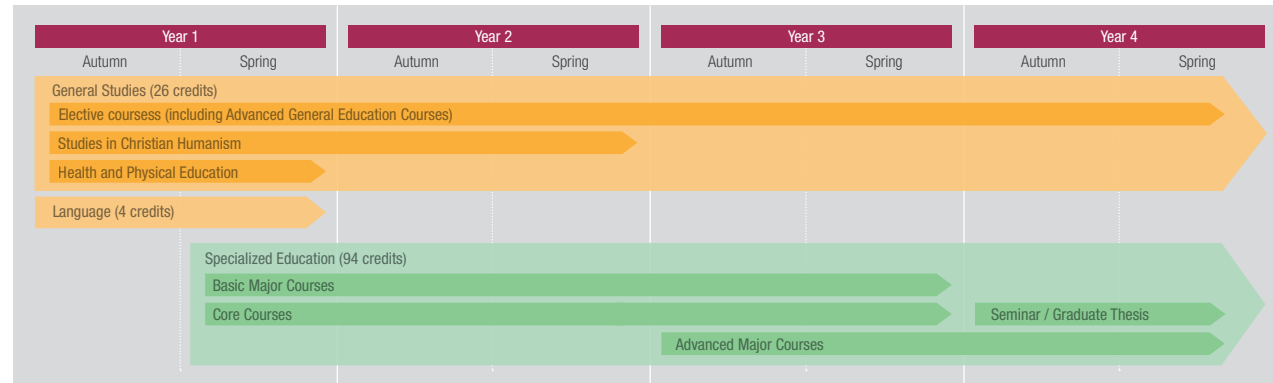
Students enrolled in those programs are required to complete all classes, take examinations, submit reports, undergo research guidance, and submit their undergraduate thesis in English.

国際的な時代のニーズに応じて、2012年9月より英語コースを正規課程の中に設置しました。
入学定員は、物質生命理工学科(グリーンサイエンスコース)25名、機能創造理工学科(グリーンエンジニアリングコース)25名です。
英語コースの学生は、授業・試験・レポート・研究指導・論文執筆もすべて英語で行い、英語だけで大学を卒業することができます。

CURRICULUM



MODEL



COURSE LIST

Faculty of Science and Technology

	Course Title	Cr.
Faculty of Science and Technology Common Subject Group I	OUTLINE OF SCIENCE & TECHNOLOGY	2
	MATHEMATICS A (LINEAR ALGEBRA)	2
	MATHEMATICS B (CALCULUS)	2
	MATHEMATICS EXERCISE 1	1
	BASIC PHYSICS 1	2
	BASIC PHYSICS 2	2
	BASIC CHEMISTRY	2
	BASIC BIOLOGY	2
	BASIC INFORMATICS	2
	EXPERIMENTS & EXERCISE OF BASIC SCIENCE	1
ENGL. FOR SCI/ENGINEERING (ENVIRONMENT)	2	
Faculty of Science and Technology Common Subject Group II	MATHEMATICS C1 (STATISTICAL DATA ANALYSIS)	2
	MOLECULAR BIOLOGY	2
	MATHEMATICS B2 (CALCULUS OF SEVERAL VARIABLES)	2
	BASIC DIFFERENTIAL EQUATIONS	2
	INORGANIC CHEMISTRY (ANALYTICAL CHEMISTRY)	2
	ORGANIC CHEMISTRY	2
	PHYSICAL CHEMISTRY	2
	FOURIER & LAPLACE TRANSFORMS	2
	THERMODYNAMICS	2
	CELL BIOLOGY	2
	INTRODUCTION TO QUANTUM MECHANICS	2
	ATOMIC & MOLECULAR SCIENCES	2
	GEOSCIENCE	2
	ELECTROMAGNETISM	2
	SCIENCE TECHNOLOGY AND ENVIRONMENT	2
FUNDAMENTAL BIOCHEMISTRY	2	
ATMOSPHERIC CHEMISTRY	2	

Department of Materials and Life Sciences (Green Science)

	Course Title	Cr.
Department Core Courses	MATERIALS AND LIFE SCIENCES (PHYSICS)	2
	MATERIALS AND LIFE SCIENCES (CHEMISTRY)	2
	MATERIALS AND LIFE SCIENCES (BIOLOGY)	2
	MATERIALS AND LIFE SCIENCES LAB. A	1
	MATERIALS AND LIFE SCIENCES LAB. B	1
	MATERIALS AND LIFE SCIENCES LAB. C	1
	CHEMISTRY LAB. 1	1
	CHEMISTRY LAB. 2	1
	PHYSICAL CHEMISTRY LAB.	1
	BIOLOGY LAB.1	1
	BIOLOGY LAB.2	1
	BIOLOGY LAB.3	1
	SEMINAR 1	1
	SEMINAR 2	1
	GRADUATION RESEARCH 1	1
GRADUATION RESEARCH 2	1	
Department Specialized Courses	ATOMIC AND MOLECULAR SPECTROSCOPY	2
	INSTRUMENTAL ANALYSIS	2
	ORGANIC AND NATURAL PRODUCT CHEMISTRY	2
	ENVIRONMENTAL ANALYTICAL CHEMISTRY	2
	GREEN CHEMISTRY	2
	RADIATION PHYSICS AND CHEMISTRY	2
	CATALYSIS CHEMISTRY	2
	CERAMICS & GLASS MATERIALS	2
	THEORY-AIDED MOLECULAR DESIGN	2
	QUANTUM REACTION DYNAMICS	2
	TOPICS OF GREEN SCIENCE 1	2
	TOPICS OF GREEN SCIENCE 2	2
	TOPICS OF GREEN SCIENCE 3	2
	TOPICS OF PLANT SCIENCE	2
	STRUCTURAL CHEMISTRY	2
SEPARATION PHYSICS AND CHEMISTRY	2	

Department of Engineering and Applied Sciences (Green Engineering)

	Course Title	Cr.
Department Core Courses	ENGINEERING AND APPLIED SCIENCES 1	2
	ENGINEERING AND APPLIED SCIENCES 2	2
	ENGINEERING AND APPLIED SCIENCES 3	2
	ENGINEERING AND APPLIED SCIENCES LAB. 1	1
	ENGINEERING AND APPLIED SCIENCES LAB. 2	1
	GREEN ENGINEERING LAB. 1	1
	GREEN ENGINEERING LAB. 2	1
	GREEN ENGINEERING LAB. 3	1
	TOPICS OF GREEN ENGINEERING 1	2
	TOPICS OF GREEN ENGINEERING 2	2
Department Specialized Courses	GRADUATION RESEARCH 1	1
	GRADUATION RESEARCH 2	1
	THERMAL ENERGY CONVERSION	2
	FLUID ENERGY CONVERSION	2
	ENERGY & MATERIALS	2
	NUCLEAR ENERGY ENGINEERING	2
	OPTICS	2
	ELECTRICAL DRIVES AND CONTROLS	2
	CLEAN ENERGY	2
	SIMULATION ENGINEERING	2
COMMUNICATION AND NETWORK ENGINEERING	2	
TOPICS OF GREEN ENGINEERING 3	2	
AIRCRAFT DESIGN WITH MECHANIC OF FLIGHT	2	
PHYSICS AND ENGINEERING OF ELECTRONIC DEVICES	2	
ELECTRIC POWER SYSTEM ENGINEERING	2	
POWER ELECTRONICS	2	

MESSAGE



FROM TEACHING STAFF

MASASHIRO FUJITA Professor (Class advisor of Green Science)

The Green Science Program is composed of three disciplines, including biology, chemistry, and physics, where students can learn the fundamentals and applications of each discipline. The objective of the Program is to develop human resources who can contribute to finding solutions to complex social problems, including those related to the environment, through the acquisition of not only

advanced knowledge and skills in various areas of expertise, but also interdisciplinary perspectives. For example, in my laboratory, we are studying the development of new materials for non-flammable and safe rechargeable batteries and biomaterials using cellulose, a material that is abundantly available in nature.



ORIE SAKAMOTO Associate Professor (Class advisor of Green Engineering)



The Green Engineering Program offers a wide range of subjects related to mechanical engineering, electrical and electronics engineering, and physics. In today's world, in order to identify society's problems including global environmental issues, and to discuss and study their solutions, it has become essential to work together with people from various fields based on interdisciplinary knowledge and experiences.

It is our hope that through this program and Sophia University as a whole, we would be able to meet and learn with students from different countries, regions, thereby helping them find a subject worth pursuing and enrich their lives.

FABIEN TRIHAN Associate Professor (in charge of Mathematics)

You may ask: Why do I need to learn that? Is mathematics really useful? Well, this is my answer. Today, as we are not living in the jungle anymore, the strongest person is not necessarily the most valued person in the society. Now is the age of information. What is valued is the capacity to learn, find, and use information efficiently. Doing math is exactly doing that; you exercise your mind to become

smart and be able to learn new topics. Thus, it is your choice whether to pursue studies in mathematics or not. You may discover that math is used in the GPS of your smartphone or whenever you use your bank card through cryptography. You also may be able to use your reasoning ability in another field. Come study with us!



FROM STUDENTS

CHOI WONJOON Student (Green Science Program)



As a son of a diplomat, I have traveled around the world and have encountered many unique cultures and environments. Through my journey, the high levels of pollution from third-world countries left a great impression on me to pursue a future in restoring the environment. The Green Science program not only provided the resources to facilitate my dream, but also an exceptional environment and community which heightened and stimulated my skills intellectually and socially. The connections I made with colleagues and professors in this international community was a priceless experience. The small

class sizes allowed professors to interact with each student individually and accommodate the course according to the students' need. The flexibility of this program provided access to variety of subjects that are even outside the science department such as in engineering, programming, history, literature, and so forth. The guidance provided by Sophia University helped me get accustomed to Japanese language, society, and its culture, which has ultimately aided my future in Japan. I'm grateful for this opportunity, and I plan to repay this generosity by contributing to the Japanese community and the world.

ALEX TANAKA Student (Green Engineering Program)

Green Engineering may be a term you've never heard of or speculated about. This is a new discipline in engineering that focuses on sustainability and environmental friendliness, which is relevant to today's world and the emerging problems facing today's society, such as climate change and global warming. Not only does Sophia University provide opportunities to learn, investigate, and tackle issues concerning our planet, it also creates a place where we can meet students from all over the world, engage in a wide variety of

extracurricular activities, and live in one of the world's best cities. Studying in one of the world's largest metropolitan cities that is full of energy, diversity, intellect, creativity, and activities is a unique experience that will broaden our horizons and stimulate intellectual curiosity. I am more than honored to be part of this global community that fosters both leading innovators and promising engineers for the future.



INFORMATION

ADMISSION

Academic Year

Entry to Sophia: every September

There are two semesters, beginning in September and April. Each semester consists of 15 weeks of classes.

Application Schedule

Applications are accepted twice a year.

■ First application

- Application period (on-line): Mid-November ~ Mid-December
*Application materials must reach Sophia Admissions Office by the appointed date.
- Notice of Results on the Sophia website: Mid-February

■ Second application

- Application period (on-line): Late-March ~ Mid-April
*Application materials must reach Sophia Admissions Office by the appointed date.
- Notice of Results on the Sophia website: Late-May

For details, please refer to: https://www.sophia.ac.jp/eng/admissions/ug_p/en_ug/fst/index.html



SCHOLARSHIPS (as of 2018)

Scholarship that can be applied at the time of admission application :

New Student Scholarship: The grant varies from one-third to the full amount of the tuition fee for the first year of study.

The application forms for those scholarships are available from <https://www.sophia.ac.jp/eng/studentlife/index.html>

Other scholarship are also available after entrance to the University. For more information, please refer to the above website.

HOUSING

Sophia University has several off-campus dormitories and offers affiliated housing options.

For more information, please refer to: <https://www.sophia.ac.jp/eng/studentlife/index.html>

For more information



GRADUATE SCHOOL OF SCIENCE AND TECHNOLOGY

<http://www.st.sophia.ac.jp/english/graduate-studies/index.html>

GRADUATE SCHOOL OF SCIENCE AND TECHNOLOGY OVERVIEW

The Graduate School of Science and Technology has one interdisciplinary graduate program with nine divisions.

The interdisciplinary graduate program aims to be both specialized, to bring to light new scientific information and technological developments in all the academic divisions, and interdisciplinary, to foster a common regard for the effects of such developments on humankind, the society, and the global environment.

The first stage of the program is designed to maintain consistency with undergraduate instruction by combining crossdisciplinary knowledge and specialty with the objective of cultivating highly educated individuals who can contribute to the well-being of humankind and the society. The second stage of the program aims to produce researchers who can execute independent research in one or more academic fields.

理工学研究科は学際的な協力も活発な1専攻9領域です。

現代科学・技術の各学問領域でその進歩に寄与する専門性と、人間社会や地球環境に与える影響を総合的にとらえる学際性をもつ研究科を目指しています。

前期課程では学部教育との一貫性に配慮しながら、複合知と専門性を兼ね備え、人間社会に貢献できる知的人材を育成します。後期課程では各専門分野で自立して研究を遂行できる研究者の養成を目的としています。

