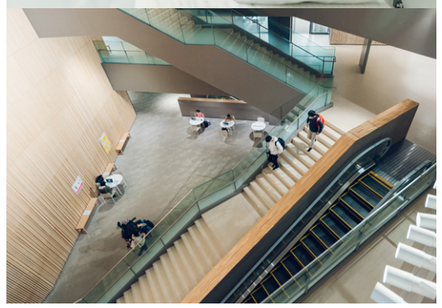
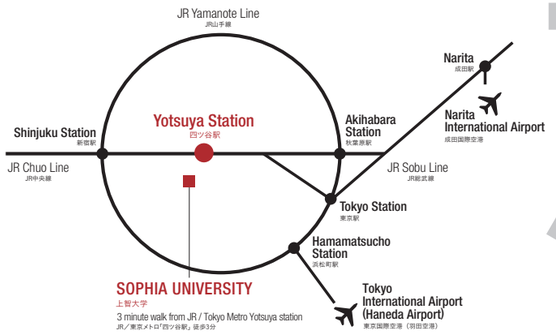
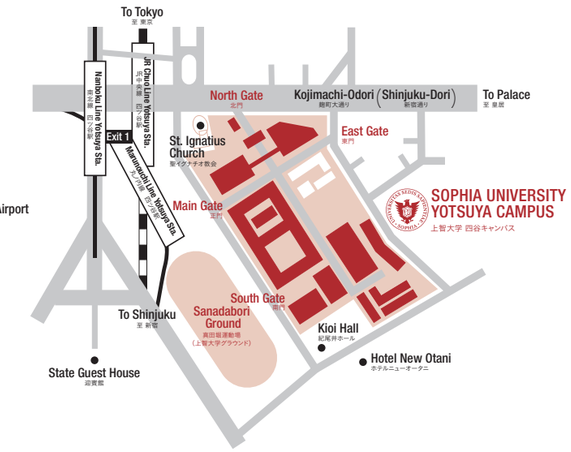


YOTSUYA CAMPUS ACCESS GUIDE





FACULTY OF SCIENCE AND TECHNOLOGY SOPHIA UNIVERSITY

7-1 Kioicho, Chiyoda-ku, Tokyo Japan
TEL. 03-3238-3300　FAX. 03-3238-3500
URL https://www.st.sophia.ac.jp/

2023.4

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

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

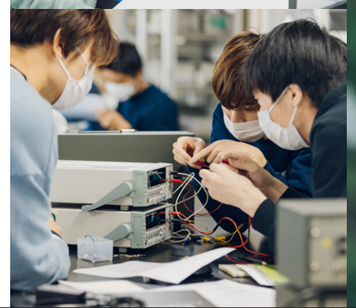
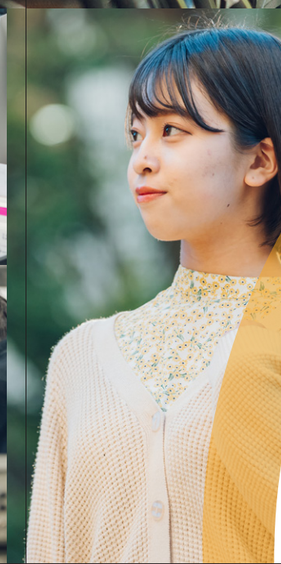
物質生命理工学科は「自然と融和した新しい物質観と生命観の教授」、機能創造理工学科は「地球環境や人間環境への貢献に資する “ もの ” を実現（創造）する叡智の教授」、情報理工学科は「“ 情報 ” を通して人間と社会に対する深い理解力の教授」を特色とした教育を行います。

MESSAGE FROM THE DEAN

TOMOHARU SHIBUYA ,Dean of the Faculty of Science and Technology

This year marks the 10th anniversary since the Green Science and Green Engineering programs were established in the Faculty of Science and Technology of Sophia University. As all subjects offered by these two programs are taught entirely in English, students can learn a variety of subjects including laboratory subjects and conduct undergraduate research in English. Furthermore, one of the foremost attractions of these English-taught programs is that small-group tutorials are held, allowing individual students to receive detailed instructions from teachers. Because there are few science and technology courses that allow students to complete their degree entirely in English in science and engineering departments in Japanese universities, both programs have attracted a large number of students from many countries and regions around the world.
In the Green Science program, students learn the basics of chemistry, applied chemistry, physics, and biology, all of which are based on the curriculum of the Department of Materials and Life Sciences. In the Green Engineering program, students learn the basics of physics, mechanical engineering, and electrical/electronic engineering, which are based on the curriculum of the Department of Engineering and Applied Sciences. In both programs, after studying the basic subjects extensively in the first and second years, students take specialized subjects in their third year with their future career design in view. Then, they receive specific guidance for their undergraduate research from the advisor of the laboratory that they join in their fourth year. On top of these, graduate programs in Green Science and Engineering, which are offered only in English, are also available in the Graduate School of Science and Technology, giving students an opportunity to acquire even greater expertise.
Besides learning in English, students who wish to learn in Japanese have several opportunities to do so. Students can learn with Japanese-course students when they enroll in laboratory subjects or conduct undergraduate research, which can lead to deepening exchanges. In addition, as almost all the faculties are located in the Yotsuya Campus, active interaction among students from different faculties or departments is possible, allowing students to experience Japanese students' culture and daily campus life firsthand.
We have prepared an appealing curriculum and learning environment for students from abroad. Both the faculty and the Japanese-course students eagerly look forward to having you with us.



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.

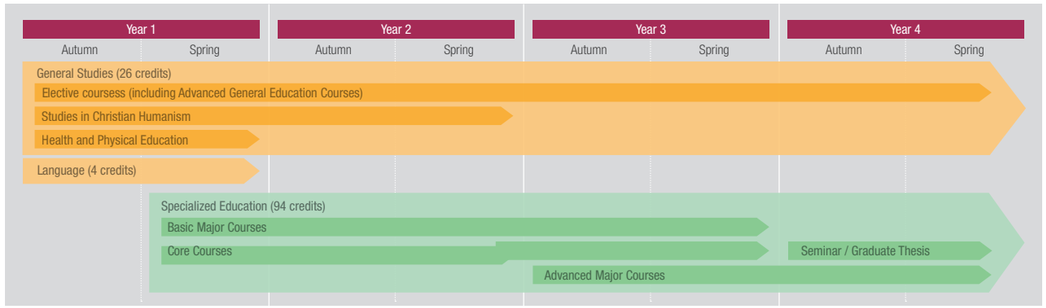
Students enrolled in those programs are required to complete all classes, take examinations, submit reports, undergo research guidance, and submit their undergraduate thesis in English.

国際的な時代のニーズに応えて、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

※There is a possibility that the English-taught programs will be reorganized starting in the 2024 academic year.
Please check our University website for the latest information.

MODEL



COURSE LIST

Faculty of Science and Technology

	Course Title	Cr.
Faculty of Science and Technology Common Subject Group Ⅰ	INTRODUCTION OF SCIENCE AND TECHNOLOGY	2
	MATHEMATICS A (LINEAR ALGEBRA)	2
	MATHEMATICS B (CALCULUS)	2
	MATHEMATICS EXERCISE 1	1
	BASIC PHYSICS I	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	BASIC PHYSICS II	2
	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
	ATMOSPHERIC CHEMISTRY	2
	ELECTROMAGNETISM	2
	SCIENCE, TECHNOLOGY AND ENVIRONMENT	2
	FUNDAMENTAL BIOCHEMISTRY	2
	TECHNOLOGY & INNOVATION -CAREER DEVELOPMENT-	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
	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 CHEMISTRY IN ANALYSIS	2
	METALLIC AND ELECTRONIC MATERIALS	2
	POLYMER 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	1
	TOPICS OF GREEN ENGINEERING 2	1
	GRADUATION RESEARCH 1	1
	GRADUATION RESEARCH 2	1
Department Specialized Courses	THERMAL ENERGY CONVERSION1	2
	FLUID ENERGY CONVERSION1	2
	ENERGY & MATERIALS1	2
	NUCLEAR ENERGY ENGINEERING	2
	MOTOR DRIVE SYSTEMS	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
	POWER ELECTRONICS	2
	ELECTRIC POWER SYSTEM ENGINEERING	2
	OPTICS	2

MESSAGE

FROM TEACHING STAFF

NOBUHIKO KUZE Professor (Class Advisor of Green Science)

In the fourth year of graduation research in the Green Science Program (GSP), you will experience a state-of-art research topic in science, such as plant/animal biology, cell biology, nervous system, molecular biology, biophysics, organic chemistry, natural product chemistry, polymer chemistry, analytical chemistry, complex chemistry, geochemistry, plasma chemistry, combustion science, microwave chemistry, inorganic material chemistry, atomic/molecular physics, molecular spectroscopy, computational chemistry, or environmental science, and will be provided with the skills necessary to find solutions to complex scientific and environmental problems from an interdisciplinary perspective. Therefore, in the GSP, you first learn the basics and experiments of three fields: biology, chemistry, and physics as the new student. Then you will learn advanced topics and skills in not only the classes but also laboratory works. Find your research field through the GSP.

MARIKO WATANABE Associate Professor (Class Advisor of Green Engineering)

Even if you are interested in environmental issues and want to contribute to society through manufacturing, you may not have a concrete idea of what types of products or technologies to develop. Green Engineering provides various ways of addressing these issues, and you may feel overwhelmed about the correct approach and what to aim for. The Green Engineering Program includes traditional academic fields, such as mechanical engineering, electrical and electronic engineering, and physics, while allowing you to conduct environmental and energy research. For example, you can conduct research to improve the energy efficiency and environmental performance of combustors, engines, and pumps by predicting and controlling the flow of gases and liquids. At Sophia University, you will find an environment that supports your learning and motivated colleagues. Why not obtain more information and experience here, set your own goals, and become a world-leading researcher or engineer?

TAD GONSALVES Professor (Teaching courses in Artificial Intelligence and programming)

The data science job market is currently in high demand, so much so that even the Arts students have been taking classes in data science and programming. Computer Science, Artificial Intelligence, and programming courses in the Green Science curriculum will provide the students with cutting-edge data analysis and programming skills necessary to survive in the current data science revolution and carve a successful career.
The current machine learning algorithms used in visual perception, speech recognition, decision-making, and language translation are trained on vast amounts of data to recognize patterns and make predictions. The downside of these algorithms is that they require large-scale computing resources and consume massive amount of electrical power to deliver results. We are far from developing a green computing technology. Students from the Green Science Program will find it a challenge to think deeply over this problem and contribute towards creating a green computing environment.

FROM STUDENTS

MELISSA ALIFA DA COSTA Student (Green Science Program)

Studying in Japan at Sophia University allowed me to experience more about the unique Japanese culture and other cultures worldwide. Throughout my college life, I was able to meet different people coming from diverse backgrounds. As a Green Science student, the international education system at Sophia University enables me to study the integrated field of Materials and Life science from a more global and sustainable perspective. In addition, the classes are small, which facilitates the students to engage in more interactive and flexible learning experiences. Furthermore, students in their junior year can experience the Research Trial program. This opportunity allows students to conduct research and be acquainted with a real research environment and other research conducted in different laboratories at the university. Thus, students can make easier decisions for their graduation research in their senior year. In fact, through this research trial opportunity, I found my interest in conducting research in the biomedical field, especially in therapeutics. Consequently, all these learning experiences instilled in me a desire to contribute to the betterment of this world by becoming a scientist and researching therapies to prevent and cure diseases from mild to the most severe, like cancer.

KARTER MAKOTOWINGTIM WONG Student (Green Engineering Program)

I decided to attend Sophia University because of its international student population, a smaller campus size, the Green Engineering program, and the enjoyable atmosphere. Sophia university's international student population allows me to understand different cultures and different perspectives from my own. The smaller campus size complements this by allowing me to be able to meet students with different opinions more frequently.
The Green Engineering program is a challenging curriculum that guides students to think of solutions to help solve the environmental problems that we are faced with today—for example, global warming, renewable energy, and reducing pollution in our environment. Finally, the overall atmosphere of the campus was very enjoyable when I visited the campus during a campus tour.
Due to the Covid 19 pandemic and then world going on lockdown, I was not able to attend classes on campus. However, I am excited to get the opportunity to study at Sophia and experience the atmosphere once again. My plan after I graduated is to go back to Hawaii and use the knowledge that I gained while studying at Sophia to help my community generate energy more sustainably and to distribute that energy more efficiently.

INFORMATION

ADMISSIONS

Academic Year

Entry to Sophia: 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.

1 First Application
- Application Period (on-line): Mid-November ~ Early-December
  Application materials must reach Sophia Admissions Office by the appointed date.
- Notice of Results: Mid-February

2 Second Application
- Application Period (on-line): Mid-March ~ Early-April
  Application materials must reach Sophia Admissions Office by the appointed date.
- Notice of Results: Early June

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

For more information

SCHOLARSHIPS (As of 2023)

A scholarship that students can apply for at the time of admission application.
New Student Scholarship: The scholarship amount varies from one-third to the full tuition fee for the first year of study.
The application form for the scholarship is available at https://piloti.sophia.ac.jp/eng/scholarships1/scholraship_e0005/
Other scholarships are also available after the entrance to the University.
For more information, please refer to the website: https://piloti.sophia.ac.jp/eng/scholarships1/

For more information

HOUSING

Sophia University has several off-campus dormitories and offers affiliated housing options.
For more information, please refer to the website: https://piloti.sophia.ac.jp/eng/housing/

For more information

GRADUATE SCHOOL OF SCIENCE AND TECHNOLOGY

https://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 I 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。