Master's Program
in Green Science and Engineering Division

Doctoral Program
in Green Science and Engineering Division

［博士前期・後期課程］

グリーンサイエンス・
エンジニアリング領域

Graduate Program
in Science and Technology
Sophia University

上智大学　理工学研究科理工学専攻

Preparing young talent to become next-generation scientists and engineers in global community

English-Based Program of Environmental and Sustainability-Related Studies

英語による「環境と持続可能性」に関連する研究プログラム

The Green Science and Engineering Division is a division in which the educational guidance is given by English. It occupies a special position among the nine divisions of the Graduate School of Science and Technology. That is, the entire educational program, including lectures and research guidance, is conducted in English. In addition, emphasis is given to environmental and sustainability-related studies, which are vital to the future of humankind.

To foster crossdisciplinary education, faculty members from the eight divisions (Mechanical Engineering, Electrical and Electronics Engineering, Applied Chemistry, Chemistry, Mathematics, Physics, Biological Science, Information Science) will be involved in teaching and research guidance. At the same time, by joining the research group of the faculty member of their choice, students can receive research guidance and pursue much more advanced research work.

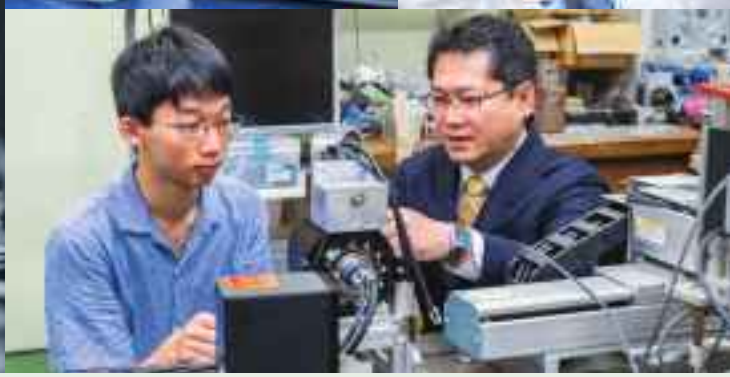
グリーンサイエンス・エンジニアリング領域は、英語による教育指導が受けられる領域です。この領域は、理工学研究科の9つの領域の中でも特別な位置づけにあります。すなわち、講義、論文指導を含むすべての教育が英語で受けられる点、また、人類の将来を考えるうえで最重要テーマである「環境と持続可能性」に関連する研究に重点が置かれた点を特徴とするプログラムです。

分野横断的な学びを推進するため、このプログラムでは他の8つの領域（機械工学、電気・電子工学、応用化学、化学、数学、物理学、生物科学、情報学）のすべての教員が教育と研究指導を担当します。同時に、学生は他の8つの領域から1人の指導教員を選び、その研究グループに参加することで、より進んだ研究と論文指導を受けることができます。

Message from the Dean

Tetsufumi Hirano
Dean of the Graduate School of Science and Technology

Welcome to the Green Science and Engineering Division of the Graduate School of Science and Technology at Sophia University. Our Faculty and Graduate School were among the first in Japan to offer full science and engineering programs taught entirely in English. Since 2012, English-taught undergraduate programs have been offered for international students, and since 2013 our Green Science and Engineering Division at our Graduate School has provided a fully English research and education environment from lectures to thesis supervision. Our program is designed to go beyond traditional academic boundaries. Instead of studying only one specific field, students learn across multiple areas of science and engineering. This cross-disciplinary approach helps you build flexible knowledge and strong problem-solving skills that are essential for addressing real-world challenges such as energy, environment, advanced materials, and data-driven technologies. Students join research projects and work closely with faculty members in laboratories. Through hands-on research experience, you will learn how new technologies are created and how scientific ideas are applied to society. Sophia University's Founding Philosophy is "Sophia - Bringing the World Together." Our campus brings together students from many countries and cultural backgrounds, creating a truly international learning community. By studying and researching together, students develop global perspectives, communication skills, and professional networks that last beyond graduation. Japan is widely recognized as a leader in advanced science and technology. Studying here gives you direct access to cutting-edge research and innovation while preparing you for an international career as a researcher or engineer. Our graduates of master course go on to work in global technology companies, research institutes, and international organizations, or continue doctoral studies to deepen their knowledge and to enhance their research skills. Another unique feature of Sophia is its "one-campus" system, where almost all faculties and graduate programs are located together. This creates a close yet diverse academic community where you can exchange ideas across fields, experience different cultures, and grow both academically and personally. We cordially invite you to challenge yourself, explore new frontiers in science and engineering, and take your first step toward a global future with us at Sophia.



Message from the Chairperson

Masahiro Fujita
Chairperson of the Master's and Doctoral Program in Green Science and Engineering Division

Welcome to the Green Science and Engineering Division of Sophia University. As the newly appointed Chair, I am delighted to welcome you to our graduate program. Our division—one of the nine within the Graduate School of Science and Technology—is dedicated to advancing science and technology for a sustainable future. Sustainability is a key challenge of our time. We aim to train researchers, scientists, and engineers who can contribute to building a sustainable society. A major advantage of our division is its interdisciplinary structure: students may choose their academic supervisor from all faculty members across the division, allowing them to pursue research that aligns with their goals. Our program is fully conducted in English, the global language of science. Through English-based lectures and research activities, students naturally gain the skills needed to participate in international research communities. Sophia University is known as one of Japan's most international universities. Our Yotsuya Campus in central Tokyo brings together students from diverse cultural and academic backgrounds, offering a unique environment that blends global perspectives with Japanese culture. I hope your experience in the Green Science and Engineering Division enriches your academic journey and empowers you to contribute to a more sustainable future. Let us work together to explore new knowledge and develop technologies that benefit society.

Graduate School of Science and Technology

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

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

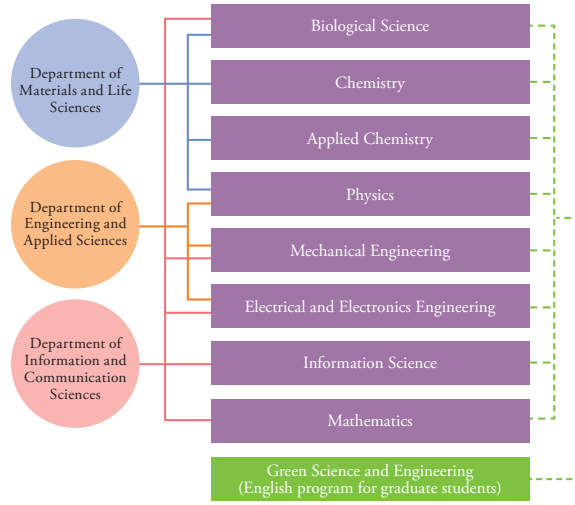
The interdisciplinary graduate program aims to be both specialized, to bring to light new scientific information and technological developments in all the academic divisions, and interdisciplinary, to foster a common regard for the effects of such developments on humankind, the society, and the global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

科学技術、情報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。



Subject to change with the establishment of a new department.
新学科の設置に伴い変更予定

Course List

科目の一覧

Compulsory Elective Subjects for Master's Program　選択必修科目（博士前期課程）

Course Title	Cr.
Master's Thesis Tutorial and Exercise 1A 大学院演習 I A	1
Master's Thesis Tutorial and Exercise 1B 大学院演習 I B	1

Course Title	Cr.
Master's Thesis Tutorial and Exercise 2A 大学院演習 II A	1
Master's Thesis Tutorial and Exercise 2B 大学院演習 II B	1

Elective Subjects for Master's Program　選択科目（博士前期課程）

Course Title	Cr.
Green Science and Engineering (Mechanical Engineering) グリーンサイエンス・エンジニアリング（機械工学）	1
Green Science and Engineering (Electrical and Electronics Engineering) グリーンサイエンス・エンジニアリング（電気・電子工学）	1
Green Science and Engineering (Applied Chemistry) グリーンサイエンス・エンジニアリング（応用化学）	1
Green Science and Engineering (Chemistry) グリーンサイエンス・エンジニアリング（化学）	1
Green Science and Engineering (Mathematics) グリーンサイエンス・エンジニアリング（数学）	1
Green Science and Engineering (Physics) グリーンサイエンス・エンジニアリング（物理学）	1
Green Science and Engineering (Bioscience) グリーンサイエンス・エンジニアリング（生物科学）	1
Green Science and Engineering (Information Science) グリーンサイエンス・エンジニアリング（情報学）	1
Artificial Intelligence 人工知能	2
Advanced Mechanical Engineering 1 アドバンストメカニカルエンジニアリング 1	2
Advanced Mechanical Engineering 2 アドバンストメカニカルエンジニアリング 2	2
Advanced Electrical and Electronics Engineering 1 電気・電子工学特論 1	2
Advanced Electrical and Electronics Engineering 2 電気・電子工学特論 2	2
Environmental Chemistry 環境化学	2
Advanced Materials 先端材料	2

Course Title	Cr.
Computational Chemistry 計算化学	2
Organic Chemistry and Natural Products 天然物化学持論	2
Differential Equations for Natural Phenomena 自然現象のための微分方程式	2
Statistical Data Analysis 統計的データ解析	2
Introduction to Subatomic Physics 素粒子原子核物理学入門	2
Introduction to Superconductivity 超伝導入門	2
Environmental Basic Biology 環境基礎生物学	2
Environmental Life Science 環境生命科学	2
Computer Science コンピュータサイエンス	2
Applied Computer Science 応用コンピュータサイエンス	2
Seminar in Green Sience and Engineering 1A	2
Seminar in Green Sience and Engineering 1B	2
Seminar in Green Sience and Engineering 2A	2
Seminar in Green Sience and Engineering 2B	2

Compulsory Subjects for Doctoral Program　必修科目（博士後期課程）

Course Title	Cr.
Doctoral Dissertation Tutorial and Exercise 3A 大学院演習 III A	1
Doctoral Dissertation Tutorial and Exercise 3B 大学院演習 III B	1
Doctoral Dissertation Tutorial and Exercise 4A 大学院演習 IV A	1

Course Title	Cr.
Doctoral Dissertation Tutorial and Exercise 4B 大学院演習 IV B	1
Doctoral Dissertation Tutorial and Exercise 5A 大学院演習 V A	1
Doctoral Dissertation Tutorial and Exercise 5B 大学院演習 V B	1

Research Topics

教員の主な研究テーマ

The thesis research supervisor can be chosen from among faculty members of the Graduate Program in Science and Technology.

Information about the disciplinary specialties and research interests of faculty members are available on the Graduate Program in Science and Technology website:

https://www.st.sophia.ac.jp/english/

指導教員は、理工学研究科のほぼすべての教員の中から選ぶことができます。

それぞれの教員の学問・研究の専門分野に関する情報は、理工学研究科のウエブサイトを参照してください。

https://www.st.sophia.ac.jp/english/

Policy

Admission Policy (AP)

Green Science / Green Engineering (Master's program) グリーンサイエンス・エンジニアリング領域（博士前期）におけるアドミッション・ポリシー

Outline 前文	The Green Science and Engineering Division (Master's Program) seeks students with the following qualities: 本領域は、次のような資質を持つ学生を求めています。
1	Students who have studied the field of Global Environmental Science and Engineering and are motivated to perform research. 地球環境科学、工学分野で勉学を行い、研究を遂行することに意欲的である学生
2	Students who possess the standard academic skills associated with Science and Engineering in general that are required to study Global Environmental Science and Engineering and pursue research in the field. 地球環境科学、工学分野で勉学を行い、研究を遂行するために必要な科学、工学全般に関する基礎学力を有している学生

Green Science / Green Engineering (Doctoral program) グリーンサイエンス・エンジニアリング領域（博士後期）におけるアドミッション・ポリシー

Outline 前文	The Green Science and Engineering Division (Doctoral Program) seeks students with the following qualities: 本領域は、次のような資質を持つ学生を求めています。
1	Students who are motivated to independently pursue creative research and development in the field of Global Environmental Science and Technology. 地球環境科学、工学分野にて、自立して創造的な研究開発を遂行することに意欲的である学生
2	Students with the expertise and English skills required to independently pursue creative research and development in the field of Environmental Science and Technology. 地球環境科学、工学分野にて、自立して創造的な研究開発を遂行するために必要な専門知識と英語力を有している学生

Curriculum Policy (CP)

Green Science / Green Engineering (Master's program) グリーンサイエンス・エンジニアリング領域（博士前期）におけるカリキュラム・ポリシー

Outline 前文	The Green Science and Engineering Division (Master's Program) seeks to cultivate the ability to contribute to the further development of global environmental sciences, engineering and associated disciplines, as well as to the development of human society and global environment conservation, by having students take courses in Green Science and Engineering and other divisions and receive research guidance. 地球環境科学、工学および関連分野の発展に寄与し、人間社会の発展や地球環境の保全に貢献できる力を涵養するため、グリーンサイエンス・エンジニアリング領域や他領域の科目を受講し、研究指導を受けさせる。
1	Students will take courses in divisions other than Green Science and Engineering as well as general science and engineering courses to acquire broad knowledge of disciplines other than their disciplinary specialty. グリーンサイエンス・エンジニアリング領域以外の領域、および理工共通領域の科目を受講することにより、自分の専門領域以外の分野について広く知識を得させる。
2	Students will take courses offered by the Green Science and Engineering Divisions to acquire expertise in these disciplines. Furthermore, they will conduct research on a specific theme; and therefore acquire profound professional knowledge of their theme in a broad context and learn about research procedures, organization and ethics. グリーンサイエンス・エンジニアリング領域が提供する科目を受講し、これらについて専門知識を得させる。また、特定のテーマについて研究を行い、このテーマと周辺について深い専門知識を得るとともに、研究の進め方、まとめ方、研究倫理などを学ばせる。
3	All courses will be offered in English and students will improve their scientific English proficiency through presentation of their research and submission to academic journals. 受講する授業はすべて英語で行われ、研究成果の発表、論文の執筆などにより、科学における英語力を向上させる。

Green Science / Green Engineering (Doctoral program) グリーンサイエンス・エンジニアリング領域（博士後期）におけるカリキュラム・ポリシー

Outline 前文	The Green Science and Engineering Division (Doctoral Program) seeks to cultivate the ability to conduct research independently based on high expertise in global environmental sciences and engineering and broad knowledge of associated disciplines, by having students take Seminars and receive research guidance. 地球環境科学、工学における高度な専門性と関連分野の広範な知識を有し、自立して研究開発を遂行できる力を涵養するため、演習を受講し研究指導を受けさせる。
1	Students will read academic papers and commentaries in interdisciplinary fields other than global environmental science and engineering to acquire broad knowledge of these disciplines. 地球環境科学、工学分野以外の学際分野などの学術論文や解説書などを精読することにより、これらの分野について広く知識を得させる。
2	Students will conduct intensive research supported by research guidance provided by faculty; and therefore acquire profound professional knowledge of their theme in a broad context, learn about research procedures, organization and ethics, and submit their dissertation as a culmination of their research. 地球環境科学、工学分野において教員の研究指導を受けながら集中して研究を遂行し、このテーマと周辺について深い専門知識を得るとともに、研究の進め方、まとめ方、研究倫理などを学び、研究の集大成として博士論文を提出させる。
3	Students will present their research outcomes in Japan and overseas in English, compile and submit academic papers in English, and conduct research at overseas institutions as required; and therefore, they will actively improve their communication skills. 得られた研究成果を国内外にて英語で発表し、また英語論文を執筆投稿し、必要に応じて海外の研究機関にて研究を行い、こられによりコミュニケーションスキルを積極的に向上させる。

Diploma Policy (DP)

Green Science / Green Engineering (Master's program) グリーンサイエンス・エンジニアリング領域（博士前期）におけるディプロマ・ポリシー

Outline 前文	Green Science and Engineering Division (Master's Program) aims to foster human resources who can contribute to the further development of Global Environmental Sciences, Engineering and associated disciplines and use their expertise to contribute to the development of human society and global environmental conservation. With a view to this aim, the program sets standards for the skills and knowledge students should acquire before graduation as described below. Those who have fulfilled the requirements and have passed the thesis defense will be awarded a diploma. 本領域では、地球環境科学、工学および関連分野の発展に寄与し、専門知識を用いて人間社会の発展や地球環境の保全に貢献できる人材の養成を目的に、学生が修了時に身につけるべき能力や知識を次のように定めています。修了要件を満たし論文審査に合格すれば、これらを身につけた者と認め、学位を授与します。
1	The ability to multidimensionally identify how technology can impact human society and the global environment, acquired by studying a wide range of disciplines, including natural science disciplines beyond one's disciplinary specialty or interdisciplinary fields covering the social sciences. 自分の専門分野以外の自然科学分野あるいは社会科学分野との学際分野も含め広範に学ぶことにより、技術が人間社会や地球環境に与える影響などを多面的にとらえる力
2	Acquisition of expertise that will lead to leadership in cutting-edge research and development in Global Environmental Sciences, Engineering and associated disciplines, and the ability to develop new technologies and explore new fields. 地球環境科学、工学および関連分野において最先端で活躍できる専門知識を身につけるとともに、新技術の開発や新分野の開拓をできる力
3	In order to accommodate globalization, a level of English proficiency that enables high social performance as well as the ability to understand connections with local communities and society. グローバル化の進展に対応するため、社会で活躍できるレベルの英語力と地域及び社会とのつながりを理解する能力
4	The ability to clearly determine the value of one's own research on the basis of relevant previous works, analyze research results using correct methodology, and write a master's thesis and/or academic research articles that objectively describe the value of the research. 先行研究を踏まえて、自身の研究の位置付けを明確に認識し、正しい方法論で研究結果を分析し、研究内容の価値を客観的に表現した学術論文、修士論文を作成できる能力

Green Science / Green Engineering (Doctoral program) グリーンサイエンス・エンジニアリング領域（博士後期）におけるディプロマ・ポリシー

Outline 前文	The Green Science and Engineering Division (Doctoral Program) aims to foster human resources who have acquired high expertise in Global Environmental Sciences and Engineering as well as interdisciplinary abilities that enables the identification of impacts on human society and the global environment in a comprehensive manner and who can independently carry out research and development. With a view to this aim, the program sets standards for the skills and knowledge students should acquire before graduation as described below. Those who have fulfilled the requirements and have passed the thesis defense will be awarded a diploma. 本領域では、地球環境科学、工学における高度な専門性を身に着け、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持ち、自立して研究開発を遂行できる人材の養成を目的に、学生が修了時に身につけるべき能力や知識を次のように定めています。修了要件を満たし論文審査に合格すれば、これらを身につけた者と認め、学位を授与します。
1	The ability to multidimensionally identify how technology can affect human society and the global environment, acquired by studying not only one's disciplinary specialty, but also a wide range of disciplines, including associated interdisciplinary fields. 自分の専門分野だけでなく、関連する学際分野なども含め広範に学ぶことにより、技術が人間社会や地球環境に与える影響を多面的にとらえる力
2	The acquisition of expertise to independently lead Global Environmental Sciences, engineering and associated disciplines and the ability to engage in creative research and development that will contribute to human development and wellbeing. 地球環境科学、工学および関連分野において最先端で自立的に活躍できる専門知識を身につけるとともに、人類の発展や幸福に寄与する創造的な研究開発を行う力
3	Research capabilities and communication skills of a level capable of leading globalization and independently playing an active role in international society. グローバル化の進展の先頭に立ち、国際社会にて独立して活躍できるレベルの研究力とコミュニケーションスキル
4	The ability to clearly determine the value of one's own research on the basis of relevant previous works, analyze research results using correct methodology, and write a doctor's thesis and/or academic research articles that objectively describe the value of the research. 先行研究を踏まえて、自身の研究の位置付けを明確に認識し、正しい方法論で研究結果を分析し、研究内容の価値を客観的に表現した学術論文、博士論文を作成できる能力

Degrees

取得できる学位

Master of Science in Green Science and Engineering or Doctor of Philosophy in Green Science and Engineering will be awarded after the completion of each respective program. They are all accredited by the Japanese Ministry of Education, Culture, Sports, and Technology (MEXT).

Master's Program students are required to take a total of 30 credits (Compulsory Elective 2, Elective 28).
Doctoral Program students are required to take a total of 6 Compulsory credits.

グリーンサイエンス・エンジニアリング領域を修了することにより、
日本の文部科学省により認定された次の学位を取得することができます。

■ 博士前期課程　修士（理学）または修士（工学）
■ 博士後期課程　博士（理学）または博士（工学）

博士前期課程では、30 単位（選択必修 2 単位、選択 28 単位）の修得が必要です。
博士後期課程では、必修 6 単位の修得が必要です。

Admissions Information

Entry Semester

- Spring (April)* and Autumn (September)
  *Spring Entry is only for Ph.D.

Method of Admission

- Document Screening, Interview

Autumn Entry (September)

- Application Period: Mid-March – Early-April
- Materials Receipt Deadline: Mid-April
- Notice of Results: Mid-June

Spring Entry (April) for Ph.D. only

- Application Period: Late-August – Mid-September
- Materials Receipt Deadline: Mid-September
- Notice of Results: Mid-November

For details, please refer to the "Application Procedure:"
https://adm.sophia.ac.jp/eng/admissions/graduate_p/english_g2/gpst

For more information

Scholarships (As of 2026)

Scholarship applications accepted at the time of admission application

- Sophia University New Student Scholarship: Recipients will recieve the amount egual to the full, half or one-third of the tuition fee for the first year.

Other financial aid programs (Applications accepted after entrance)

- Sophia University Tuition Support Scholarship: The amount egual to the full, half or one-third of the tuition fee.
- Sophia University Benefactors' Scholarships
- Other scholarship programs offered by the public or private organizations

For detailed information, please refer to the website:
https://piloti.sophia.ac.jp/eng/scholarships1/

For more information

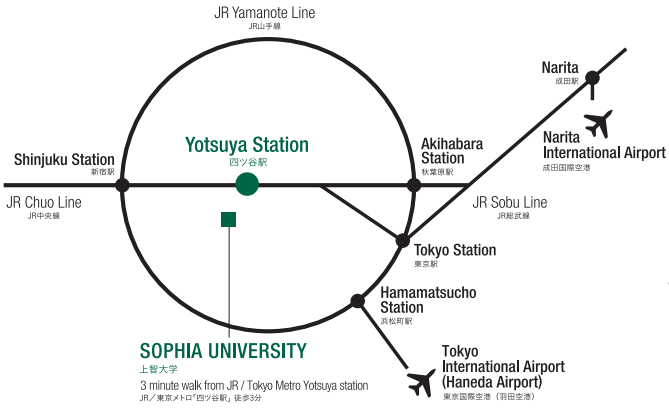
Housing

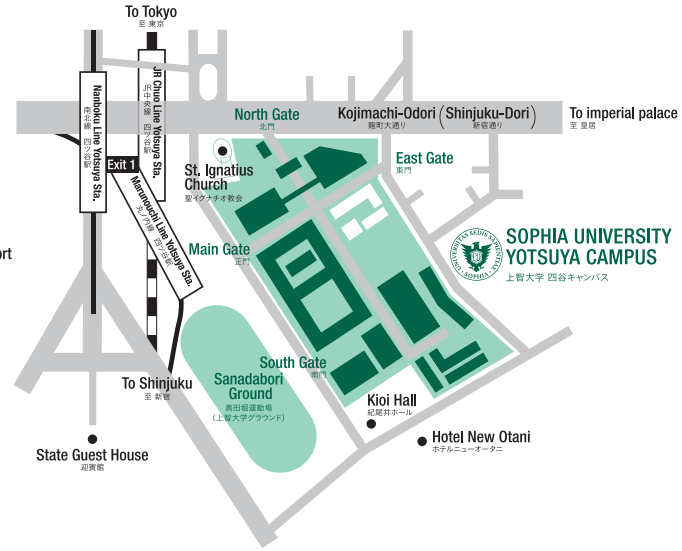
- Sophia University has several off-campus dormitories and offers affiliated housing options.

For detailed information, please refer to the website:
https://piloti.sophia.ac.jp/eng/housing/

For more information

Yotsuya Campus Access Guide





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