OVERVIEW

For International Master's / Doctoral Program

Graduate School of SCIENCE, KYUSHU UNIVERSITY

2024 Fall Admission

令和６年度　九州大学大学院理学府　履修の手引き
（国際コース・10月入学者用）

GRADUATE SCHOOL OF SCIENCE

KYUSHU UNIVERSITY

九州大学大学院理学府

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1. Graduate School of Science

The origins of the Graduate School of Science at Kyushu University date back to the time when the School of Science was founded in 1939. Following several phases of expansion and restructuring it was established in its current form in the year 2000. Initially, Master's and Doctoral programs were run in five separate departments, but since 2008 these have been confined to three; Physics, Chemistry and Earth and Planetary Sciences. Graduate programs in Mathematics and Systems Life Sciences are also offered in closely related, but independent, graduate schools.

The objective of the Graduate School of Science is to provide an atmosphere of intellectual creativity in a broad range of sciences so that through their research, students can train to become specialists in their fields. The requirements for obtaining a graduate degree are creative thinking skills, problem pursuit skills, and problem solving skills rather than simply attending classes and accumulating course credits. The education in the Graduate School of Science puts emphasis on fostering these skills by promoting academic interaction between professors and students.

In today's rapidly changing society, our graduate school remains a center of innovative education and research excellence by training experts who will play a leading role in shaping the future world we live in.

九州大学大学院理学府

九州大学大学院理学研究科は、理学部が設置された１９３９年に発足しました。理学研究科は、何度かの拡充を経て、２０００年に九州大学大学院理学研究院・理学府に改組されました。修士（理学）、博士（理学）の学位授与のための教育は、基礎粒子科学、分子科学、凝縮系科学、地球惑星科学、生物科学の５専攻において行われていましたが、２００８年より物理学、化学及び地球惑星科学の３専攻に改組されました。九州大学には密接に関連した数理学府、システム生命科学府も存在します。

理学府では、学生が幅広い分野において教育を受け、研究することによって、高度な専門家として育まれるように、知的環境の整備を行っています。学位を取得するためには、このような環境の中で単に講義を受けるだけでなく、独創的思考能力、課題探求能力と問題解決能力を身につけることが求められます。理学府の教育は、教員と学生の学術的な交流を促進し、これらの能力の涵養に重点を置いて行われています。

急速に変革する世界において、理学研究院・理学府は最先端の教育と高度な研究の中心として、社会の付託に応えています。

2. Regulations of the Graduate School of Science of Kyushu University（selection）
九州大学大学院理学府規則（抜粋）

(Purpose)
Article 1 The Regulations of the Graduate School of Science of Kyushu University shall specify the matters that each graduate school is required to specify under the provisions of the General Regulations of Graduate School of Kyushu University (Kyushu University Regulation No. 3 of 2004) and the Regulations of Kyushu University on Degrees (Kyushu University Regulation No. 86 of 2004), as well as other matters that are considered necessary for education at the Graduate School of Science (hereinafter referred to as the "Graduate School").

（趣旨）
第１条 この規則は、九州大学大学院通則（平成１６年度九大規則第３号。以下「通則」という。）及び九州大学学位規則（平成１６年度九大規則第８６号）により各学府規則において定めるよう規定されている事項その他理学府（以下「本学府」という。）の教育に関し必要と認める事項について定めるものとする。

(Educational and research purposes)
Article 1-2 Scientific study involves discovering nature’s truths, and structuring a way to systematically explain universal principles. The Graduate School of Science teaches the laws of nature together with scientific principles and methods. Our aim is to train cutting-edge researchers with a broad perspective who can take an active role in the international arena, and also professionals who use their specialist skills and knowledge to contribute to society in general.

（教育研究上の目的）
第１条の２ 理学は、自然界に存在する真理を明らかにして、体系的に説明する普遍的法則を構築する学問である。本学府は、教育研究を通じて自然の法則および理学の理念・方法を教授し、国際的な場で活躍できる広い視野を持った先端的研究者、高度な能力と学識を備え社会の広い分野で活躍する高度な専門家を養成する。

(Area of Specialization)
Article 2 The Graduate School shall have the following areas of specialization in each department.

（専門分野）
第２条 本学府の各専攻に、次の専門分野を置く。

Department	Area of Specialization
Physics	Theoretical particle and nuclear physics and astrophysics Experimental particle and nuclear physics Condensed matter theory and statistical physics Quantum condensed matter physics Complex matter physics and biophysics
Chemistry	Inorganic and Analytical Chemistry Physical Chemistry Organic Chemistry and Biochemistry Materials Chemistry and Engineering
Earth and Planetary Sciences	Dynamics, Structure and Evolution of Solid Earth and Planets Material Science of Solar Planets Earth Planetary Fluid and Space Sciences Paleontology and Mineral History

専攻	専門分野
物理学専攻	粒子宇宙論 粒子物理学 物性基礎論 量子物性 複雑物性
化学専攻	無機・分析化学 物理化学 有機・生物化学 先導物質化学
地球惑星科学専攻	固体地球惑星科学 太陽惑星系物質科学 流体圏・宇宙圏科学 地球惑星博物学

(International Program)
Article 2-2 The Graduate School will run International Programs in the fields of Physics, Chemistry, and Earth and Planetary Sciences for international students (these are degree award programs of study at both Masters and PhD levels in which English is the language of instruction).

（国際コース）
第２条の２ 本学府物理学専攻、化学専攻及び地球惑星科学専攻の修士課程及び博士後期課程に、国際コース（英語による授業等により学位取得可能な教育課程をいう。）として、留学生のための理学府英語コースを置く。

Article 2-3 Abbreviation

第２条の３ （略）

(Admission Test)
Article 3(1) A person who applies for admission shall be tested based on an achievement test and an oral test, as well as an academic transcript issued by the principal of the university (or the dean of the faculty or department, etc.) from which he/she has graduated, and other materials specified by the Graduate School.
(2) In addition to the matters prescribed in the preceding paragraph, a person who applies for admission to the second half of a doctoral course shall be tested on his/her master's thesis.

(Transfer or Switching Departments)
Article 4(1) When any person wishes to transfer to the Graduate School or switch departments, only if its admission capacity has not yet been met, he/she shall be tested in accordance with the preceding Article, after being examined by the Faculty Meeting of the Graduate School of Science (hereinafter referred to as the "Faculty Meeting of the Graduate School"), and a decision on whether to offer or refuse admission shall be made.
(2) The class subjects and credits already completed and acquired by the person who has been offered admission under the preceding paragraph as well as the number of years of his/her enrollment may be approved in whole or in part, on being examined by the Faculty Meeting of the Graduate School.

(Academic Term)
Article 5 (1) An academic year shall be divided into the following two terms:
First semester: from April 1 to September 30
Second semester: from October 1 to March 31 of the following year
(2) Class periods of the each terms specified in the preceding paragraph shall be specified separately.

(Classes and Research Guidance)
Article 6 Education at the Graduate School shall be conducted by holding classes of class subjects and providing guidance regarding the writing of a degree thesis, etc. (hereinafter referred to as "research guidance").

(Class Subjects, Credits, Methods of Taking Classes, and Examinations)
Article 7(1) Abbreviation
Article 7(2) The class subjects, credits and methods of taking classes for the International Master's/Doctoral Program in the Graduate School of Sciences shall be as specified in Appended Table 2.
(3) In addition to what is provided for in the preceding three paragraphs, temporary class subjects shall be established, following

（入学考査）
第３条 入学を志願する者に対する考査は、学力検査及び口頭試問並びに出身の大学長（学部長又は研究科等の長）による成績証明書その他本学府の定める資料によって行うものとする。

２ 博士後期課程に入学を志願する者については、前項に定めるもののほか修士論文についても考査を行うものとする。

（転学、転学府又は専攻の変更）
第４条 転学、転学府又は専攻の変更を希望する者がある場合は、収容人員に余裕があるときに限り、本学府教授会の審査を経て、前条に準じた考査を行い、許可又は不許可を決定する。

２ 前項により、転学、転学府又は専攻の変更を許可された者が既に履修した授業科目及び修得した単位並びに在学年数については、本学府教授会において審査の上、その全部又は一部を認めることができる。

（学期）
第５条 学年を分けて次の２学期とする。
前期　４月１日から９月３０日まで
後期　１０月１日から翌年３月３１日まで

２ 前項に定める各学期の授業期間は、別に定める。

（授業及び研究指導）
第６条　本学府の教育は、授業科目の授業及び学位論文の作成等に対する指導（以下「研究指導」という。）によって行うものとする。

（授業科目、単位、履修方法及び試験）

第７条　（略）
２　留学生のための理学府英語コースの授業科目、単位及び履修方法は、別表２のとおりとする。

３　前３項に定めるもののほか、本学府教授会の議を経て、臨時に授業科目を開設することがある。

discussions at the Faculty Council of Graduate School.
(4) As a general rule, one credit for lectures and seminars shall be 15 hours or 30 hours, and one credit for experiments and practical training shall be 30 hours or 45 hours. However, in cases where this is not feasible, the Dean of the Graduate School shall determine separately with the approval of the Faculty Council.

４　単位計算の基準は、原則として、講義及び演習については１５時間又は３０時間をもって１単位、実験及び実習については３０時間又は４５時間をもって１単位とする。ただし、これによりがたい場合は、教授会の議を経て、学府長が別に定める。

Article 8 (1) A student shall, at the beginning of each semester, select class subjects that he/she intends to take in accordance with the guidance of his/her academic adviser, obtain approval from the teachers of the class subjects, and notify his/her selection to the Dean of the Graduate School of Sciences (hereinafter referred to as the "Dean").
(2)The Graduate School may designate courses and credits from other departments, the KIKAN Education for Graduate Schools, graduate schools, or undergraduate school to be taken if the Graduate School deems it to be effective from an educational standpoint.
(3) The class subjects and number of credits, among those acquired under the provision of the preceding paragraph, which may be regarded as part of the credits required for completing the course, shall be specified by each department.

第８条　学生は、毎学期の始めに、履修しようとする授業科目を指導教員の指示に従って選定し、その授業科目を担当する教員の承認を得て、理学府長（以下「本学府長」という。）に届け出なければならない。

２　学府において、教育上有益と認めるときは、他の専攻若しくは大学院基幹教育若しくは学府又は学部の課程による授業科目及び単位を指定して、履修させることがある。

３　前項の規定により履修した授業科目のうち課程修了の要件となる単位に充当することができる授業科目及び単位数は、専攻ごとに定める。

Article 9 (1) A student who intends to take an examination for the class subject that he/she has taken shall notify the teacher in charge of the class subject of such intention and obtain permission therefrom.
(2)Through the Faculty Meeting of the Graduate School, when deeming it to be necessary, a make-up examination may be held for a student who was unable to take the examination due to illness or for any other compelling reason.

第９条　履修した授業科目について、試験を受けようとする者は、当該授業科目の担当教員に申し出て、その許可を受けなければならない。

２　病気その他やむを得ない事由のため受験できなかった者に対しては、本学府教授会の議を経て、本学府長が必要と認める場合は、追試験を行うことがある。

(Credits Acquired at Graduate Schools of Other Universities)
Article 10(1) A student's academic adviser may, when he/she deems it to be effective from an educational standpoint, have the student take class subjects at graduate schools of other universities designated by the Graduate School.
(2) Through the Faculty Meeting of the Graduate School, may approve up to fifteen of the credits acquired under the provision of the preceding paragraph, as part of the credits required for completing the course.
(3) Through the Faculty Meeting of the Graduate School, when deeming it to be effective from an educational standpoint, the Dean may have a student receive necessary research guidance at graduate schools of other

（他の大学院における授業科目の履修等）

第１０条 指導教員が教育上有益と認めるときは、本学府が指定する他の大学院の授業科目を履修させることができる。

２ 前項の規定により修得した単位は、本学府長が、本学府教授会の議を経て、１５単位を限度として課程修了の要件となる単位として認定することができる。

３ 本学府長は、本学府教授会の議を経て、教育上有益と認めるときは、他の大学院又は研究所等において必要な研究指導を受けさせることができる。ただし、修士課程の学生について認める場合には、当該研究指導を受けさ

universities or research institutes, etc. However, the period for said research guidance shall not exceed one year for master students.
(4) A person who intends to take class subjects or receive necessary research guidance pursuant to the provisions of paragraph (1) or the preceding paragraph shall obtain permission from the Dean.

せる期間は、１年を超えないものする。

４ 第１項又は前項の規定により授業科目を履修し、又は必要な研究指導を受けようとする学生は、本学府長の許可を得なければならない。

Article 11(1) The period of studying at a graduate school of a foreign university (limited to such graduate school approved through the Faculty Meeting of the Graduate School), up to one year throughout the master's course and the second half of the doctoral course, may be included in the period of enrollment required for completing the course.
(2) Through the Faculty Meeting of the Graduate School, may approve up to fifteen of the credits acquired at a graduate school of a foreign university as set forth in the preceding paragraph, as part of the credits required for completing the course.

第１１条 外国の大学の大学院（本学府長が、本学府教授会の議を経て承認した大学院に限る。）に留学した期間は、修士課程及び博士後期課程を通して、１年間を限度として課程修了の要件となる在学期間として取り扱うことができる。

２ 前項の外国の大学の大学院において修得した単位は、本学府長が、本学府教授会の議を経て、１５単位を限度として課程修了の要件となる単位として認定することができる。

（Period-extension System）
Article 11-2 Through the Faculty Meeting of the Graduate School, may approve his/her planned completion of the curricula as specified by the Dean, when a student of the Graduate School has reported to the Dean his/her wish to complete the curricula for graduation over a certain period of time exceeding the original duration of study in a planned manner, under Article 26 of the General Regulations.

（長期にわたる教育課程の履修）
第１１条の２ 本学府の学生が、通則第２６条の規定に基づき、標準修業年限を超えて一定の期間にわたり計画的に教育課程を履修し課程を修了することを希望する旨を本学府長に申し出たときは、本学府教授会の議を経て本学府長が定めるところにより、その計画的な履修を認めることができる。

(Maximum number of credits acquired by taking courses at other graduate schools)
Article 11-3 The number of credits that can be approved as requirements for course completion pursuant to the provisions of Article 10, paragraph (2) and Article 11, paragraph (2) shall be limited to 15 credits in total, except in the case of transfer, etc. as stipulated in Articles 15, 17 and 17-2 of the General Regulations.

（他の大学院における授業科目の履修により修得した単位の上限）
第１１条の３ 第１０条第２項及び第１１条第２項の規定により課程修了の要件となる単位として認定することができる単位数は、通則第１５条、第１７条及び第１７条の２に規定する転学等の場合を除き、合わせて１５単位を限度とする。

(Requirements for Completing the Master's Course)
Article 12 In order to complete the master's course of the Graduate School, a student shall be required to be enrolled in the course for at least two years, acquire at least 30 credits by taking the class subjects specified under Article 7, and after receiving necessary research guidance, pass the review of a master's thesis and the final examination; provided, however, that in the case of a person who has made a remarkable research achievement, it shall be sufficient for such person to be enrolled in the master's course for at least one year, if the

（修士課程の修了要件）
第１２条 本学府の修士課程の修了要件は、修士課程に２年以上在学し、第７条に定める授業科目について３０単位以上を修得し、かつ、必要な研究指導を受けた上、修士論文の審査及び最終試験に合格することとする。ただし、総長が認めるときは、在学期間に関しては、優れた業績を上げた者については、修士課程に１年以上在学すれば足りるものとする。

President of Kyushu University permits.

(Requirements for Completing the Doctoral Course)

Article 13(1) In order to complete the doctoral course of the Graduate School, a student shall be required to be enrolled in the course for at least five years (if the student was in the master's course for at least two years and completed the course, those two years shall be counted toward the five-year requirement), acquire at least 42 credits by taking the class subjects specified under Article 7, and after receiving necessary research guidance, pass the review of a doctoral thesis and the final examination; provided, however, that in the case of a person who has made a remarkable research achievement, it shall be sufficient for such person to be enrolled in the doctoral course for at least three years (if the student was in the master's course for at least two years and completed the course, those two years shall be counted toward the three-year requirement), if the President of Kyushu University permits.

(2) The provision of the preceding paragraph shall be applied mutatis mutandis to the doctoral requirements for a student who has completed a master's course in the standard duration of study of more than one year and less than two years under Article 3, paragraph (3) of the Standards for the Establishment of Graduate Schools (Ministry of Education Regulation No.28 of 1974), and for a student who has completed a master's course within the duration of study pursuant to the proviso of the preceding Article. In this case, the term "five years (if the student was in the master's course for at least two years and completed the course, those two years shall be counted toward the five-year requirement)" in the preceding paragraph shall be deemed to be replaced with "period to which three years are added to the period of enrollment in the master's course", and the term "three years (if the student was in the master's course for at least two years and completed the course, those two years shall be counted toward the three-year requirement)" shall be deemed to be replaced with "three years (including the period enrolled in the master's course)."

(3) Notwithstanding the provisions of the preceding two paragraphs, in order to complete the doctoral course, a student who has been recognized as having an academic ability equivalent to someone with a master's degree or a professional degree in respect of the admission to the Graduate School pursuant to Article 156 of the Ordinance for Enforcement of the School Education Act (Ordinance of the Ministry of Education No.11 1947) and a student who has been admitted to the doctoral course shall be enrolled in the doctoral course for at least three

（博士課程の修了要件）

第１３条 本学府の博士課程の修了要件は、博士課程に５年（修士課程に２年以上在学し、当該課程を修了した者にあっては、当該課程における２年の在学期間を含む。）以上在学し、第７条に定める授業科目について４２単位以上を修得し、かつ、必要な研究指導を受けた上、博士論文の審査及び最終試験に合格することとする。ただし、総長が認めるときは、在学期間に関しては、優れた研究業績を上げた者については、博士課程に３年（修士課程に２年以上在学し、当該課程を修了した者にあっては、当該課程における２年の在学期間を含む。）以上在学すれば足りるものとする。

２ 大学院設置基準（昭和４９年文部省令第２８号）第３条第３項の規定により標準修業年限を１年以上２年未満とした修士課程を修了した者及び前条ただし書の規定による在学期間をもって修士課程を修了した者の博士課程の修了要件については、前項中「５年（修士課程に２年以上在学し、当該課程を修了した者にあっては、当該課程における２年の在学期間を含む。）」とあるのは「修士課程における在学期間に３年を加えた期間」と、「３年（修士課程に２年以上在学し、当該課程を修了した者にあっては、当該課程における２年の在学期間を含む。）」とあるのは「３年（修士課程における在学期間を含む。）」と読み替えて、前項の規定を適用する。

３ 前２項の規定にかかわらず、学校教育法施行規則（昭和２２年文部省令第１１号）第１５６条の規定により大学院への入学資格に関し修士の学位若しくは専門職学位を有する者と同等以上の学力があると認められた者又は専門職学位課程を修了した者が、博士後期課程に入学した場合の博士課程の修了要件は、博士後期課程に３年（法科大学院の課程を修了した者にあっては、２年）以上在学し、第７条に定める授業科目について１２単位以上を修得し、かつ、必要な研究指導を受けた上、博士論文の審査及び最終試験に合格することとする。ただ

years (two years for a student who has completed the course in the Professional Graduate School of Law), acquire at least 12 credits pursuant to Article 7, and after receiving necessary research guidance, pass the review of a doctoral thesis and the final examination; provided, however, that in the case of a person who has made a remarkable research achievement, it shall be sufficient for such person to be enrolled in the doctoral program for at least one year (in the case of a student who has completed the professional degree course with the standard duration of study of more than one year but less than two years, the relevant completed period of study shall be subtracted from the three years), if the President of Kyushu University permits.

し、総長が認めるときは、在学期間に関しては、優れた研究業績を上げた者については、博士後期課程に１年（標準修業年限が１年以上２年未満の専門職学位課程を修了した者にあっては、３年から当該１年以上２年未満の期間を減じた期間）以上在学すれば足りるものとする。

(Review of Master's Thesis, etc.)
Article 14(1) The Faculty Meeting of the Graduate School shall review a student's master's thesis if he/she has passed his/her final examination based on a review conducted by each department.

（修士論文の審査等）
第１４条 修士論文の審査及び最終試験の合格又は不合格は、専攻ごとに行う調査に基づき、本学府教授会が審査する。

(2) A student must submit his/her master's thesis described in the preceding paragraph within the period specified by each department of the Graduate School.

２ 前項の修士論文は、本学府の各専攻において定める期間内に提出しなければならない。

(Submission of Doctoral Thesis)
Article 15 A student may not submit his/her doctoral thesis unless he/she has been enrolled in the second half of the doctoral course for at least two years and has received necessary research guidance; provided, however, that a student who is in the second half of the doctoral course and has made a remarkable research achievement may submit his/her thesis even if his/her period of enrollment is shorter than two years.

（博士論文の提出）
第１５条 博士論文は、博士後期課程に２年以上在学し、かつ、必要な研究指導を受けなければ提出することができない。ただし、博士後期課程に在学する者で、優れた研究業績を上げたものは、在学期間が２年に満たなくても論文を提出することができる。

Article 16 Abbreviation

第１６条 （略）

(Credited Auditors)
Article 17 A person who may apply for admission as a credited auditor shall be as specified in Article 2, paragraph (2) of the Regulations of Kyushu University on Credited Auditors (Kyushu University Regulation No. 91 of 2004).

（科目等履修生）
第１７条 科目等履修生として入学を志願できる者は、九州大学科目等履修生等規則（平成１６年度九大規則第９１号）第２条第２項に定めるところによる。

Article 18(1) A person who applies for admission as a credited auditor shall file with the Dean a prescribed application form stating the class subjects that he/she wishes to take, accompanied by his/her resume and the application fee.

第１８条 科目等履修生として入学を志願する者は、所定の願書に履修しようとする授業科目を記載し、履歴書及び検定料を添えて、本学府長に願い出なければならない。

(2) The Dean may offer admission to the person who has filed an application as set forth in the preceding paragraph, on being selected, at the beginning of the academic year or academic

２ 本学府長は、学生の授業に支障がないときは、前項の願い出があった者について選考の上、学年又は学期の始めに入学を許可することができる。

term, provided that classes for students of the Graduate School are not impeded.

Article 19 Academic achievement shall be assessed for the class subjects taken by a credited auditor, and the prescribed credits shall be given to him/her for the class subjects that he/she has passed.

第１９条 科目等履修生の履修した授業科目については、成績評価を行い、合格とされたものについて所定の単位を与える。

Article 20 The Dean may issue a required certificate with regard to the credits acquired by a credited auditor.

第２０条 本学府長は、科目等履修生の修得した単位について、所要の証明書を交付することができる。

(Auditors)
Article 21 A person who wish to audit a class subject in the appended table may be admitted as an auditor.

（聴講生）
第２１条 別表の授業科目について聴講を志願する者があるときは、聴講生として聴講を許可することがある。

Article 22 A person who has graduated with a bachelor's degree or has an academic ability equal to or greater than that of a graduate with a bachelor's degree may apply to audit a class subject.

第２２条 聴講を志願できる者は、大学を卒業した者又はこれと同等以上の学力を有する者とする。

Article 23 A person who wishes to audit a class subject must submit to the Dean a designated application form together with a resume and an examination fee.

第２３条 聴講を志願する者は、所定の願書に履歴書及び検定料を添えて本学府長に提出しなければならない。

Article 24 The Faculty Meeting of the Graduate School shall specify the method of selecting auditors from among audit applicants.

第２４条 聴講を志願する者に対する選考方法については、本学府教授会が定める。

(Miscellaneous Provisions)
Article 25 In addition to what is provided for in these Regulations and the others, any other matters of school affairs shall be specified by the Dean through the Faculty Meeting of the Graduate School whenever necessary.

（雑則）
第２５条 この規則その他規則等に定めるもののほか、本学府の校務について必要がある事項については、その都度本学府教授会の議を経て、本学府長がこれを定める。

3. Master's Course

Students of Master's course are required to acquire 30 credits with 18 credits of compulsory subject and 12 credits of elective subject. Students must obtain 30 credits with a minimum pass grade of 60 % (grade C).

・Compulsory Courses:　6 courses (18 credits)

・Optional Courses:　Minimum of 12 credits to be selected from choice of Common and Optional Courses in Physics, Chemistry, and Earth and Planetary Sciences

The Master's course curriculum is presented in Table 1-1~1-4.

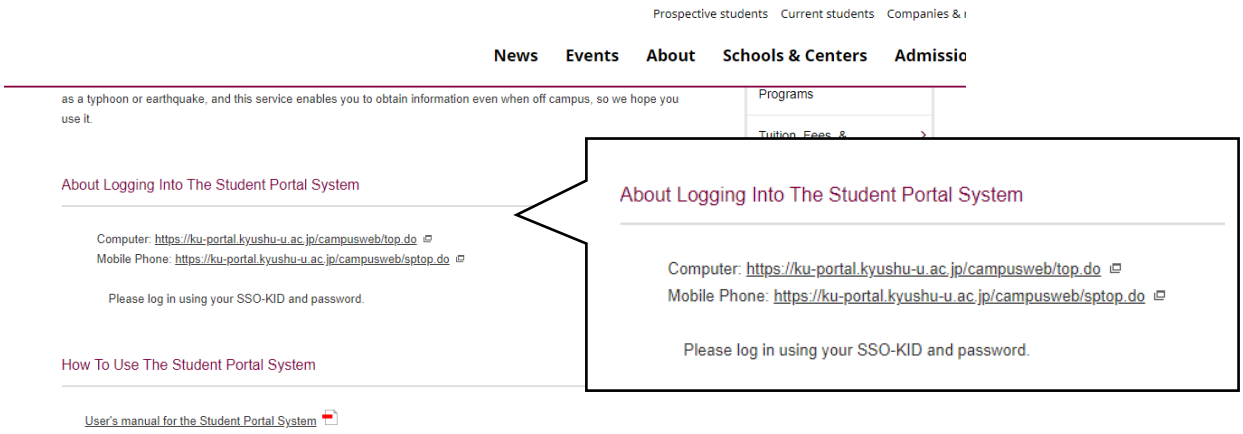
1) Registration, View confirmation of your registration or marks

When enrolling for any courses, it is essential that you consult with your supervisor first. Registration procedure must be completed through the student portal system during the designated course registration period.

Student Portal Systems: https://www.kyushu-u.ac.jp/en/faculty/class/learning/portal

（Kyushu University Top Page > Academics> Courses & Registration > Registration / syllabuses > Student Portal System）

You can also access this information from outside the campus.



Simply input your user ID (SSO-KID) and password and then click on 'Login'.

The following OSes and browsers are guaranteed compatibility with web classes.

OS	Windows 8.1 or above, Mac OS
Web browser	Internet Explorer, Microsoft Edge, Mozilla Firefox, Google Chrome, Safari, Mobile Safari, Chrome for Android

修士課程

修士課程では、必修科目１８単位以上、選択科目１２単位以上、合計３０単位以上の修得が必要です。また、成績は６割（評価：C）以上で合格となります。

・必修科目：６科目（１８単位）

・選択科目：理学府共通科目または各専攻科目の選択科目から１２単位以上

修士課程の履修細目は、表 1-1～1-4 に示しています。

履修登録、成績確認について

どの科目を履修するかは、必ず、指導教員に相談してください。

履修登録手続きは、決められた履修登録期間に、学生ポータルシステムで行ってください。

学生ポータルシステムへのログイン画面は以下のとおりです。

履修確認・成績確認は学外からでもアクセスできます。

https://www.kyushu-u.ac.jp/ja/faculty/class/learning/portal

（九州大学 トップページ > 学部・大学院等 > 授業（オンライン含む）・履修 > 履修・シラバス > 履修登録・成績確認（保護者含む））

ログイン画面で、ユーザーID（SSO-KID）とパスワードを入力し、「ログイン」ボタンをクリックします。

また、学生ポータルシステムで動作が保証されている OS 及びブラウザは次のとおりです。

OS	Windows 8.1 以上, Mac OS
Web ブラウザ	Internet Explorer, Microsoft Edge, Mozilla Firefox, Google Chrome, Safari, Mobile Safari, Chrome for Android

Table 1-1：Common Courses　表 1-1：理学府共通科目

Course Title			Course Outline	Credits	MC1 第 1 学年		MC2 第 2 学年	
					Fall & Winter 秋&冬	Spring & Summer 春&夏	Fall & Winter 秋&冬	Spring & Summer 春&夏
Common Courses	Compulsory Courses	MSc. Thesis Research	Research and related studies for the master's thesis. These are done under the direction of sub-advisors as well as the chief advisor.	5	○ Full Year 通年			
		MSc. Thesis Writing	Master's thesis writing in English, including discussion with the chief advisor and sub-advisors.	5			○ Full Year 通年	
		Literature Survey	This course involves survey of literature on the student's research field and discussions with the chief advisor on it. Making a short review and presentation are required depending on the department.	2		○		
		Research Seminar Ⅰ	This course involves presentation and discussion in the group seminar on the basic topics of the student's research field.	2		○		
		Research Seminar Ⅱ	This course involves presentation of the student's research and discussion in the group seminar, which includes making research plans for the master's thesis.	2			○	
		Research Seminar Ⅲ	This course involves presentation of the student's research and discussion in the group seminar, which is mainly for making the master's thesis.	2				○
	Optional Courses	Communication in English	This course is an exercise lesson by a native English speaker for the scientific communication in English.	1	○		○	
		Presentation in English	This course is an exercise lesson by a native English speaker for the scientific presentation in English. This is advanced course of Communication in English.	1		○		○
		Internship Ⅰ	In this course, the students visits commercial companies (or research organizations) to study how science and technology are utilized in the society.	1	○			
		Internship Ⅱ	In this course, the students work in commercial companies (or research organizations) for a period to cultivate their problem-solving capability in the society.	1			○	
		Frontiers in Science Ⅰ	This is an omnibus-style class, which involves lectures and practices including recent topics by each research field of professors.	1	○			
		Frontiers in Science Ⅱ	This is an omnibus-style class, which involves lectures and practices including recent topics by each research field of professors.	1	○			

Table 1-2：Physics Courses　表 1-2：物理学専攻共通科目

	Course Title	Course Outline	Credits	MC1 第 1 学年		MC2 第 2 学年	
				Fall & Winter 秋&冬	Spring & Summer 春&夏	Fall & Winter 秋&冬	Spring & Summer 春&夏
Optional Courses	Theoretical Nuclear Physics 理論核物理学	Theoretical aspects of nuclear physics are discussed from microscopic viewpoint. The course is composed of basic principles and some applications covering the following range of the field: nuclear structure, nuclear reaction, as well as hadron physics based on the QCD.	2	○			
	Quantum Statistical Physics 量子統計物理学	Basic theory and applications of the quantum field theory for statistical physics. We will discuss the spontaneous symmetry breaking phenomena, through superfluidity and superconductivity.	2	○			
	Quantum Field Theory 場の量子論	Introductory but somewhat technical exposition of the relativistic quantum field theory.	2	○			
	Nonequilibrium Statistical Physics 非平衡物理学	Non-equilibrium physics has been applied to chemical, biological, and economical phenomena as well as physical phenomena. This lecture deals with relaxation phenomena from a non-equilibrium state to an equilibrium state by the theory of Brownian motions.	2	○			
	Nonlinear Physics 非線形物理学	The hierarchical structure of the description of macroscopic systems is introduced. By the course-graining we obtain nonlinear effective models. On the basis of such effective models chaos and solitons are discussed as typical nonlinear phenomena.	2	○			
	Semiconductor Physics 半導体物理学	Basic physics of semiconductor, semiconductor interface and semiconductor devices.	2	○			
	Physics of Elementary Excitations 素励起物理学	In the solid state physics, the disturbance in the many-body system (low-lying excited state) can be regarded as a particle, which is called a quasiparticle or an elementary excitation. Typical examples are electrons, phonons, polarons etc. Our goal is to understand the concepts of quasiparticles or elementary excitations on the basis of elementary quantum field theory.	2	○			
	Physics on Complex System 複雑系物理学	The physical approach of “soft condensed matter” including polymer, liquid crystals and colloids is discussed as typical examples of complex systems.	2	○			
	Experimental Nuclear Physics 実験核物理学	Nuclear physics is the study of the properties of nuclei and of the interactions between nucleons. This course is concerned the experimental aspects of the subject. It treats the experimental techniques and instrumentation most often used in nuclear and particle physics experiments as well as in various other experimental sciences.	2	○			
	Theoretical Particle Physics 素粒子理論	This course involves several aspects of theoretical particle physics for those who have a basic knowledge of quantum field theory.	2	○			
	Experimental Particle Physics 素粒子実験	Experimental particle physics, often called as high energy physics, is the field to study elementary particles and fundamental forces among the particles using experimental apparatuses such as particle accelerators and detectors. This lecture introduces basics of experimental particle physics.	2	○			

	Course Title	Course Outline	Credits	MC1 第1学年		MC2 第2学年	
				Fall & Winter 秋&冬	Spring & Summer 春&夏	Fall & Winter 秋&冬	Spring & Summer 春&夏
Optional Courses	Physics of Magnetism 磁性体物理学	Magnetism is based on the angular momentum and exchange interaction. Physics of magnetism is an elegant application of quantum mechanics. The purpose of this course is to understand the concept of magnetism by employing the quantum mechanics.	2	○			
	Advanced Physics Ⅰ 物理学特論Ⅰ	Special series of lectures dedicated to a topical subject that is not covered in the regular courses. The actual contents will be announced separately.	2	○			
	Advanced Physics Ⅱ 物理学特論Ⅱ	Special series of lectures dedicated to a topical subject that is not covered in the regular courses. The actual contents will be announced separately.	2	○			
	Seminar of Physics Ⅰ 物理学セミナーⅠ	Special series of lectures dedicated to a topical subject that is not covered in the regular courses. The actual contents will be announced separately.	2	○			
	Seminar of Physics Ⅱ 物理学セミナーⅡ	Special series of lectures dedicated to a topical subject that is not covered in the regular courses. The actual contents will be announced separately.	2	○			
	Intensive Course on Physics Ⅰ 物理学特別講義Ⅰ	Special series of lectures dedicated to a topical subject that is not covered in the regular courses. The actual contents will be announced separately.	1	○			
	Intensive Course on Physics Ⅱ 物理学特別講義Ⅱ	Special series of lectures dedicated to a topical subject that is not covered in the regular courses. The actual contents will be announced separately.	1	○			
	Intensive Course on Physics Ⅲ 物理学特別講義Ⅲ	Special series of lectures dedicated to a topical subject that is not covered in the regular courses. The actual contents will be announced separately.	1	○			
	Intensive Course on Physics Ⅳ 物理学特別講義Ⅳ	Special series of lectures dedicated to a topical subject that is not covered in the regular courses. The actual contents will be announced separately.	1	○			
	Intensive Course on Physics Ⅴ 物理学特別講義Ⅴ	Special series of lectures dedicated to a topical subject that is not covered in the regular courses. The actual contents will be announced separately.	1	○			

Table 1-3：Chemistry Courses　表 1-3：化学専攻共通科目

	Course Title	Course Outline	Credits	MC1 第 1 学年		MC2 第 2 学年	
				Fall & Winter 秋&冬	Spring & Summer 春&夏	Fall & Winter 秋&冬	Spring & Summer 春&夏
Optional Courses	Advanced Inorganic Chemistry ⅠA 無機化学特論ⅠA	This class will cover the fundamental concepts of magneto-chemistry of coordination compounds. The goal is to understand the magnetic properties of coordination compounds, the correlation among magnetic properties, crystal structure and electron configuration, and the analytical method for temperature and magnetic-field dependences of magnetic properties.	1	○			
	Advanced Inorganic Chemistry ⅠB 無機化学特論ⅠB	This class will cover the fundamental concepts of magneto-chemistry of coordination compounds. The goal is to understand the magnetic properties of coordination compounds, the correlation among magnetic properties, crystal structure and electron configuration, and the analytical method for temperature and magnetic-field dependences of magnetic properties.	1	○			
	Advanced Inorganic Chemistry ⅡA 無機化学特論ⅡA	How can we learn about the chemical and physical properties of transition metal complexes either in solution or in the solid state? What are the structure, distortion, oxidation state, symmetry, redox property, spectroscopic property, reactivity, and catalytic activity? Roles in enzymes? This lecture introduces some common techniques used to study such properties of inorganic compounds, including X-ray crystallography, NMR, ESR (electron spin resonance), electrochemistry, XPS, and mass spectrometry (MS). Dinuclear manganese complexes are discussed to understand the electrochemistry and mixed-valence chemistry. ESR is introduced to understand the highly exchange-coupled S=9/2 spin state of an Mn(II)Mn(III) dimer. Disproportionation reactions of the system will also be discussed.	1	○			
	Advanced Inorganic Chemistry ⅡB 無機化学特論ⅡB	How can we learn about the chemical and physical properties of transition metal complexes either in solution or in the solid state? What are the structure, distortion, oxidation state, symmetry, redox property, spectroscopic property, reactivity, and catalytic activity? Roles in enzymes? This lecture introduces some common techniques used to study such properties of inorganic compounds, including X-ray crystallography, NMR, ESR (electron spin resonance), electrochemistry, XPS, and mass spectrometry (MS). Dinuclear manganese complexes are discussed to understand the electrochemistry and mixed-valence chemistry. ESR is introduced to understand the highly exchange-coupled S=9/2 spin state of an Mn(II)Mn(III) dimer. Disproportionation reactions of the system will also be discussed.	1	○			

	Course Title	Course Outline	Credits	MC1 第1学年		MC2 第2学年	
				Fall & Winter 秋&冬	Spring & Summer 春&夏	Fall & Winter 秋&冬	Spring & Summer 春&夏
Optional Courses	Advanced Inorganic Chemistry ⅢA 無機化学特論ⅢA	Inorganic Chemistry Special Lecture IIIA will cover fundamentals of solid-state chemistry, such as the crystal structure and electronic states of solids (band theory).	1	○			
	Advanced Inorganic Chemistry ⅢB 無機化学特論ⅢB	Inorganic Chemistry Special Lecture IIIB will cover the fundamental chemistry of nanoscale materials from the perspective of solid-state chemistry.	1	○			
	Advanced Analytical Chemistry ⅠA 分析化学特論ⅠA	The purpose of this subject is to learn observation and analytical methods of geological and geochemical samples in atomic and molecular level for research of earth environmental science and to understand chemical reactions on the surface of earth based on the obtained results.	1	○			
	Advanced Analytical Chemistry ⅠB 分析化学特論ⅠB	The purpose of this subject is to learn observation and analytical methods of geological and geochemical samples in atomic and molecular level for research of earth environmental science and to understand chemical reactions on the surface of earth based on the obtained results.	1	○			
	Advanced Analytical Chemistry ⅡA 分析化学特論ⅡA	This course will present basic principles of NMR spectroscopy and its applications to biological systems.	1	○			
	Advanced Analytical Chemistry ⅡB 分析化学特論ⅡB	This course will introduce comprehensive bioanalytical techniques such as liquid/gas chromatography, electrophoresis, mass spectrometry, and next-generation sequencing.	1	○			
	Advanced Analytical Chemistry ⅢA 分析化学特論ⅢA	This course is designed to provide students with advanced knowledge of light-matter interactions for understanding and using spectrochemical analysis. Topics include classical light-matter interaction, non-linear optical interaction, light absorption and emission, and advanced laser spectroscopy.	1	○			
	Advanced Analytical Chemistry ⅢB 分析化学特論ⅢB	This course is designed to provide students with advanced knowledge of light-matter interactions for understanding and using spectrochemical analysis. Topics include classical light-matter interaction, non-linear optical interaction, light absorption and emission, and advanced laser spectroscopy.	1	○			
	Advanced Structural Chemistry ⅠA 構造化学特論ⅠA	This course provides fundamentals of quantum chemistry. Students will overview the introduction of quantum mechanics (Planck-Einstein relation and de Broglie wave) and revisit 1-D classical wave equation, 1-D time-independent and time-dependent Schrödinger equations, statistics, particle in a box, uncertainty principle, commutators etc. Through this course, they will deepen their knowledge about quantum chemistry and utilize it for practical problems.	1	○			

	Course Title	Course Outline	Credits	MC1 第1学年		MC2 第2学年	
				Fall & Winter 秋&冬	Spring & Summer 春&夏	Fall & Winter 秋&冬	Spring & Summer 春&夏
Optional Courses	Advanced Structural Chemistry ⅠB 構造化学特論ⅠB	This course provides fundamentals of quantum chemistry. Students will revisit a harmonic oscillator, angular momentum, spherical harmonics, a rigid rotor, Boltzmann distribution, the wave functions and the energy levels of the hydrogen atom, Rydberg constant, orthonormality of wave functions, variational principle etc. Through this course, they will deepen their knowledge about quantum chemistry and utilize it for practical problems.	1	○			
	Advanced Structural Chemistry ⅡA 構造化学特論ⅡA	This course deals with the dynamics of photodissociation processes. Students will learn how measurement of the internal state and angular distributions of the products can provide fundamental information about how molecules are held together, how they interact with light, and what happens when they fall apart.	1	○			
	Advanced Structural Chemistry ⅡB 構造化学特論ⅡB	This course deals with the dynamics of chemical reactions. Students will learn how atoms and molecules collide and react, how the reaction rates and angular distributions of scattering are related to the potential energy surface, and how the energy is exchanged between various degrees of freedom during the collision.	1	○			
	Advanced Structural Chemistry ⅢA 構造化学特論ⅢA	Advanced topics of modern quantum chemistry will be described. The focus will be on the modern molecular orbital and density functional theories, now widely used in theoretical studies, and their applications to various chemical systems.	1	○			
	Advanced Structural Chemistry ⅢB 構造化学特論ⅢB	The course provides an overview of computational chemistry, including molecular dynamics simulations and quantum chemical calculations, as well as lectures on the fundamentals and applications of quantum computers.	1	○			
	Advanced Physical Chemistry ⅠA 物理化学特論ⅠA	This course offers a comprehensive overview of the fundamental principles governing linear and nonlinear optical interactions between light and molecules, along with their applications in material and life sciences. Students will learn light-matter interactions through the framework of semiclassical quantum theory. The course will cover, in detail, the principles and applications of various spectroscopic techniques, including UV/Vis/IR absorption, emission, Raman scattering, and harmonic generation.	1	○			
	Advanced Physical Chemistry ⅠB 物理化学特論ⅠB	This course offers a comprehensive overview of the fundamental principles governing linear and nonlinear optical interactions between light and molecules, along with their applications in material and life sciences. Students will learn light-matter interactions through the framework of semiclassical quantum theory. The course will cover, in detail, the principles and applications of various spectroscopic techniques, including UV/Vis/IR absorption, emission, Raman scattering, and harmonic generation.	1	○			

	Course Title	Course Outline	Credits	MC1 第1学年		MC2 第2学年	
				Fall & Winter 秋&冬	Spring & Summer 春&夏	Fall & Winter 秋&冬	Spring & Summer 春&夏
Optional Courses	Advanced Physical Chemistry ⅡA 物理化学特論ⅡA	This course provides an overview of the research on the physical chemistry of water soluble polymers and polyelectrolytes. Students are assumed to have taken elementary courses on statistical physics, thermodynamics and mathematics related to them.	1	○			
	Advanced Physical Chemistry ⅡB 物理化学特論ⅡB	This course provides an overview of the research on the physical chemistry of water soluble polymers and polyelectrolytes. Students are assumed to have taken elementary courses on statistical physics, thermodynamics and mathematics related to them.	1	○			
	Advanced Physical Chemistry ⅢA 物理化学特論ⅢA	Chemical thermodynamics and Statistical thermodynamics are necessary for us to understand solution, phase equilibrium, and interfacial phenomena. First, we teach the basics of these thermodynamics and then extend them to understand properties of electrolyte solution, electrochemical phenomena, adsorption and colloidal system of amphiphiles.	1	○			
	Advanced Physical Chemistry ⅢB 物理化学特論ⅢB	Chemical thermodynamics and Statistical thermodynamics are necessary for us to understand solution, phase equilibrium, and interfacial phenomena. First, we teach the basics of these thermodynamics and then extend them to understand properties of electrolyte solution, electrochemical phenomena, adsorption and colloidal system of amphiphiles.	1	○			
	Advanced Organic Chemistry ⅠA 有機化学特論ⅠA	This course offers on natural products chemistry including the following items: retrosynthetic analysis and synthetic strategies of total syntheses of natural products, C-C bond formation (asymmetric aldol reactions and crotylations, olefinations, and cross-coupling reactions) and functional group transformations (oxidation, reduction, acylation, glycosylation, and protecting groups).	1	○			
	Advanced Organic Chemistry ⅠB 有機化学特論ⅠB	This course offers on natural products chemistry including the following items: biosynthetic pathways and structure determination of natural products, synthetic strategies of total syntheses of natural products, case studies of total syntheses of natural products. Chemical biology based on natural products and mode-of-actions of natural products are also offered in this lecture.	1	○			
	Advanced Organic Chemistry ⅡA 有機化学特論ⅡA	This class teaches kinetics and dynamics in stereoselective organic reactions using asymmetric catalysis. In addition, basic points of homogeneous and heterogeneous catalysis are also discussed.	1	○			
	Advanced Organic Chemistry ⅡB 有機化学特論ⅡB	This class teaches kinetics and dynamics in stereoselective organic reactions using asymmetric catalysis. In addition, basic points of homogeneous and heterogeneous catalysis are also discussed.	1	○			
	Advanced Organic Chemistry ⅢA 有機化学特論ⅢA	In this course, I will lecture about the organic synthesis using organometallic compounds including homogeneous transition-metal catalysis.	1	○			

	Course Title	Course Outline	Credits	MC1 第1学年		MC2 第2学年	
				Fall & Winter 秋&冬	Spring & Summer 春&夏	Fall & Winter 秋&冬	Spring & Summer 春&夏
Optional Courses	Advanced Organic Chemistry ⅢB 有機化学特論ⅢB	In this course, I will lecture about the organic synthesis using organometallic compounds including homogeneous transition-metal catalysis.	1	○			
	Advanced Biological Chemistry ⅠA 生物化学特論ⅠA	The lecture focuses on the relationships between the structures and functions of proteins. Building on knowledge of functional protein structures, the lecture course will explore the many structural essentials, which are critical to construction of biological function.	1	○			
	Advanced Biological Chemistry ⅠB 生物化学特論ⅠB	The lecture focuses on the relationships between the structures and functions of proteins. Building on knowledge of functional protein structures, the lecture course will explore the many structural essentials, which are critical to construction of biological function.	1	○			
	Advanced Biological Chemistry ⅡA 生物化学特論ⅡA	This class will focus on foundations and applications of chemical biology including biomolecular labeling and fluorescence imaging. Furthermore, this course will also provide an overview of how biochemistry contributes to current medical science, based on the latest innovations and topics.	1	○			
	Advanced Biological Chemistry ⅡB 生物化学特論ⅡB	This class will focus on foundations and applications of chemical biology including biomolecular labeling and fluorescence imaging. Furthermore, this course will also provide an overview of how biochemistry contributes to current medical science, based on the latest innovations and topics.	1	○			
	Advanced Biological Chemistry ⅢA 生物化学特論ⅢA	This course will cover the fundamental concepts of biosynthesis of bioactive molecules and signal transduction mechanisms. The goal is to understand the biological activities of hormones, activation and signal transduction mechanism via receptors, and structural analysis methods for ligand-receptor complexes.	1	○			
	Advanced Biological Chemistry ⅢB 生物化学特論ⅢB	This course focuses on the physical aspects of biological systems. Biological systems are condensed matter. Thermodynamics, statistical mechanics, and kinetics are valuable tools in understanding such systems. This class aims to learn mathematics and physics through some biological phenomena.	1	○			
	Advanced Materials Chemistry ⅠA 物質機能化学特論ⅠA	This course introduces the fundamentals of magnetic, conducting, dielectric, and optical properties of functional molecular materials.	1	○			
	Advanced Materials Chemistry ⅠB 物質機能化学特論ⅠB	This course introduces the fundamentals of magnetic, conducting, dielectric, and optical properties of functional molecular materials.	1	○			
	Advanced Materials Chemistry ⅡA 物質機能化学特論ⅡA	Undecidedness	1	○			

	Course Title	Course Outline	Credits	MC1 第1学年		MC2 第2学年	
				Fall & Winter 秋&冬	Spring & Summer 春&夏	Fall & Winter 秋&冬	Spring & Summer 春&夏
Optional Courses	Advanced Materials Chemistry ⅡB 物質機能化学特論ⅡB	Undecidedness	1	○			
	Advanced Physical Organic Chemistry ⅠA 物理有機化学特論ⅠA	Undecidedness	1	○			
	Advanced Physical Organic Chemistry ⅠB 物理有機化学特論ⅠB	Undecidedness	1	○			
	Advanced Physical Organic Chemistry ⅡA 物理有機化学特論ⅡA	This course offers physical and structural organic chemistry related to photo- and electronic properties of pi-conjugated organic compounds, mechanism of photosynthesis and artificial electronic devices.	1	○			
	Advanced Physical Organic Chemistry ⅡB 物理有機化学特論ⅡB	This course offers physical and structural organic chemistry related to photo- and electronic properties of pi-conjugated organic compounds, mechanism of photosynthesis and artificial electronic devices.	1	○			
	Introduction of Nanomaterials and Interfaces Ⅰ ナノ界面物性概論Ⅰ	This course offers an introductory to learn nanosceince and nanotechnology for chemistry students, which includes fundamentals of surface and interfaces characterized by surface-sensitive characterization techniques and also the latest nano-fabrication techniques with top-down and bottom-up methods.	1	○			
	Introduction of Nanomaterials and Interfaces Ⅱ ナノ界面物性概論Ⅱ	This course offers fundamentals and applications of surface/interface and nanomaterials including characterization, biosensing, and surface chemistry of biomaterials.	1	○			
	Intensive Lecture on Chemistry Ⅰ 化学特別講義Ⅰ	This course gives a lecture, a subject of which is not included in the normal lectures.	1	○			
	Intensive Lecture on Chemistry Ⅱ 化学特別講義Ⅱ	This course gives a lecture, a subject of which is not included in the normal lectures.	1	○			
	Intensive Lecture on Chemistry Ⅲ 化学特別講義Ⅲ	This course gives a lecture, a subject of which is not included in the normal lectures.	1	○			
	Intensive Lecture on Chemistry Ⅳ 化学特別講義Ⅳ	This course gives a lecture, a subject of which is not included in the normal lectures.	1	○			
	Intensive Lecture on Chemistry Ⅴ 化学特別講義Ⅴ	This course gives a lecture, a subject of which is not included in the normal lectures.	1	○			
	Intensive Lecture on Chemistry Ⅵ 化学特別講義Ⅵ	This course gives a lecture, a subject of which is not included in the normal lectures.	1	○			

Table 1-4：Earth and Planetary Sciences Courses　表 1-4：地球惑星科学専攻共通科目

	Course Title	Course Outline	Credits	MC1 第 1 学年		MC2 第 2 学年	
				Fall & Winter 秋&冬	Spring & Summer 春&夏	Fall & Winter 秋&冬	Spring & Summer 春&夏
Optional Courses	Earth and Planetary Fundamental Sciences Ⅰ 基礎地球惑星科学Ⅰ	This course gives a lecture and/or an exercise on fundamentals for the master's degree program in the earth and planetary sciences. Different subjects are selected for Ⅰ and Ⅱ.	2	○			
	Earth and Planetary Fundamental Sciences Ⅱ 基礎地球惑星科学Ⅱ	This course gives a lecture and/or an exercise on fundamentals for the master's degree program in the earth and planetary sciences. Different subjects are selected for Ⅰ and Ⅱ.	2	○			
	Solar Planetary System Physics 太陽惑星系物理学	We intend to study the cutting-edge research areas related to the physics of the solar planetary system which includes plasma, such as the Sun, solar wind, and terrestrial and planetary magnetosphere and ionosphere. For this purpose, we read recent scientific journal papers in turns. Specific papers are selected each year.	2	○			
	Evolution of Early Solar System 初期太陽系進化論	This course gives a lecture on the formation and evolution of planetary systems, the understanding of which grows recently based on observational, experimental and theoretical studies.	2	○			
	Physics of the Upper Atmosphere and Magnetosphere 電磁圏・超高層大気物理学	This class lectures our latest knowledge on the electromagnetic structures and coupling of the wide range of regions including the sun, the magnetosphere, the ionosphere, and the upper atmosphere. The knowledge has been obtained by observations on the ground and by spacecraft. We read textbooks and recent journal papers.	2	○			
	Space Electrodynamics 宇宙電磁力学	The course consists of two parts. The first half introduces fundamentals of magnetohydrodynamics from the first principles. With the view of space plasma, limitation of magnetohydrodynamic description is also addressed. On the basis of the first part, the second half provides key methods of describing a complex system of space plasma. The methods are then applied to the solar wind-magnetosphere-ionosphere coupled system.	2	○			
	Dynamic Meteorology 大気力学特論	This graduate-level Atmospheric Science course covers the fundamentals of Atmospheric dynamics.	2	○			
	Middle Atmosphere Physics 中層大気物理学	This lecture provides a comprehensive introduction of the physics of the middle atmosphere which is the atmospheric region from the tropopause (10-16km) to the homepause (at approximately 110km). In particular, it gives fundamental principles of wave-mean flow interactions based on the Transformed Eulerian-Mean (TEM) equations, along with observational features of some spectacular phenomena in the middle atmosphere, e.g., stratospheric sudden warmings and the quasi-biennial oscillation.	2	○			
	Science of the Troposphere 対流圏科学	This graduate-level Tropospheric Science course covers the fundamentals of Meteorology and Climate Dynamics.	2	○			

	Course Title	Course Outline	Credits	MC1 第1学年		MC2 第2学年	
				Fall & Winter 秋&冬	Spring & Summer 春&夏	Fall & Winter 秋&冬	Spring & Summer 春&夏
Optional Courses	Fluid Dynamics 流体力学特論	This course gives a lecture on the fluid dynamics, in which compressible hydrodynamics and magnetohydrodynamics are especially picked up. The knowledge of dynamics, electromagnetics, thermodynamics and incompressible hydrodynamics are required.	2	○			
	Physical Seismology 地震物理学	Lectures on the propagation of seismic waves, deformation of the Earth, generation mechanisms of the geomagnetic field and dynamics of the core for understanding structures and dynamics of the Earth.	2	○			
	Dynamics of the Earth's Interior 地球内部ダイナミクス	This course gives a lecture and/or an exercise on fundamentals for the master's degree program in the dynamics of the mantle and core of the Earth.	2	○			
	Dynamical Aspects of Petrology 岩石運動論	This course gives a lecture on fundamentals of thermodynamics for solid materials and kinetics of phase transition.	2	○			
	Introduction to Evolution of the Earth 地球変動史概論	This course gives introductory notes on the recent progress of on-going tectonic and sedimentary evolution under the sea and on the origin and formation of ancient accretionary complexes to understand Phanerozoic geologic history.	2	○			
	Earth Environment A 地球環境学 A	This course gives a lecture on the geologic time scale and geologic age for reconstructing paleoenvironmental changes, such as numerical age dating using radiogenic nuclides and relative age dating.	1	○			
	Earth Environment B 地球環境学 B	The basics of reconstructing paleo-environmental conditions are introduced to graduate students whose backgrounds are in geology and geophysics.	1	○			
	Organic Geochemistry and Biogeochemistry 有機・生物地球化学	Various organic matters are widely distributed at cosmic and planetary environments, as well as on the Earth associated with the biological activities. In this class, we study fundamentals of natural organic matter and geochemical cycles of organic compounds. We also study biomarkers in organic geochemistry with their isotope signatures with respect to environmental changes. The chemical evolution of organic matter is another topic for understanding of origins of life in the universe, in which we learn organic chemistry of extraterrestrial materials such as meteorites. We further review analytical techniques to study molecular and isotopic compositions of organic matters in natural samples.	2	○			
	Methodology in Inorganic Geochemistry 無機地球化学解析論	The sources, behaviors, and fates of elements, inorganic matter on the Earth will be discussed, with special emphasis on methods of approaches, and analyses of data.	2	○			
	Mineral Physics and Chemistry 鉱物物性科学	This course gives advanced lectures on submicron scale view and properties of planetary materials and exercise for data analysis acquired by modern technique.	2	○			
	Observational Seismology 観測地震学	This course gives a lecture and/or an exercise on the methods of observation and data analysis for understanding the crust/ upper-mantle structure and generating mechanism of earthquakes.	2	○			

	Course Title	Course Outline	Credits	MC1 第1学年		MC2 第2学年	
				Fall & Winter 秋&冬	Spring & Summer 春&夏	Fall & Winter 秋&冬	Spring & Summer 春&夏
Optional Courses	Observational Volcano-geophysics 観測火山学	This course gives a lecture and/or an exercise on the methods of observation and data analysis for understanding the process of magma accumulation and mechanism of volcanic eruptions.	2	○			
	Mathematical Analysis Seminar for Seismology and Volcanology 地震火山数理演習	This course gives a lecture on Spectrum analysis, Inverse problem and Basic mathematics for geodetic measurements with the application to the observational study of earthquake and volcano, and shares the discussion on the subjects.	2	○			
	Seminar of Seismological and Volcanological Instrumentation 地震火山計測演習	This course gives a lecture on Observation system and methods. Electronic circuit and Data acquisition & processing system with the application to the observational study of earthquake and volcano, and shares the discussion on the subjects.	2	○			
	Evolutionary Paleobiology 進化古生物学	This graduate-level Paleontology course covers the fundamentals of Paleoecology of invertebrate fossils, as well as specialized topics within Ammonoid Taphonomy.	2	○			
	Advanced Field work ⅠA 地球惑星科学発展実習ⅠA	This course gives the lecture and practice including field trips to acquire advanced methods on the field work in the earth and planetary sciences.	1	○			
	Advanced Field work ⅠB 地球惑星科学発展実習ⅠB	This course gives the lecture and practice including field trips to acquire advanced methods on the field work in the earth and planetary sciences.	1	○			
	Advanced Field work ⅡA 地球惑星科学発展実習ⅡA	This course gives the lecture and practice including field trips to acquire advanced methods on the field work in the earth and planetary sciences.	1	○			
	Advanced Field work ⅡB 地球惑星科学発展実習ⅡB	This course gives the lecture and practice including field trips to acquire advanced methods on the field work in the earth and planetary sciences.	1	○			
	Special Lecture on Earth and Planetary Sciences Ⅰ 地球惑星科学特別講義Ⅰ	This course gives a lecture, a subject of which is not included in the normal lectures. Different subjects are selected for courses I and Ⅱ.	2	○			
	Special Lecture on Earth and Planetary Sciences Ⅱ 地球惑星科学特別講義Ⅱ	This course gives a lecture, a subject of which is not included in the normal lectures. Different subjects are selected for courses I and Ⅱ.	2	○			
	Special Exercise for Earth and Planetary Sciences Ⅰ 地球惑星科学特別演習Ⅰ	This course gives a fundamental exercise needed for a subject of master thesis in the earth and planetary sciences.	1	○			
	Special Exercise for Earth and Planetary Sciences Ⅱ 地球惑星科学特別演習Ⅱ	This course gives an advanced exercise needed for a subject of master thesis in the earth and planetary sciences.	1	○			

4. Doctoral Course
博士後期課程

Students of Doctoral course are not necessarily required to take the courses because research is the main activity.

・Compulsory Courses: DSc. Thesis Research and Writing (12 credits)

The Doctoral course curriculum is presented in Table 2.

博士後期課程は、研究が主な活動になるので、必ずしも授業科目を履修する必要はありません。

・必修科目：DSc. Thesis Research and Writing（１２単位）

博士後期課程の履修細目は、表２に示しています。

Table 2：Doctoral Courses　表２：博士後期課程科目

Course Title		Course Outline	Credits	DC1 第１学年		DC2 第２学年		DC3 第３学年	
				Fall & Winter 秋&冬	Spring & Summer 春&夏	Fall & Winter 秋&冬	Spring & Summer 春&夏	Fall & Winter 秋&冬	Spring & Summer 春&夏
Compulsory Courses	DSc. Thesis Research and Writing	Research and related studies for the doctoral thesis. These are done under the direction of sub-advisors as well as the chief advisor. Doctoral thesis writing in English, including discussion with the chief advisor and sub-advisors.	12	○					
Optional Courses	Research Presentation Ⅰ	The ability to present research results (e.g. in international and domestic conferences) are acquired in the student's own research. Specifically, it announces the research and sends in conformity with the progress of the research of the student. It measures extension of its ability.	1	○					
	Research Presentation Ⅱ	The ability to present research results (e.g. in international and domestic conferences) are acquired in the student's own research. Specifically, it announces the research and sends in conformity with the progress of the research of the student. It measures extension of its ability.	1			○			
	Research Presentation Ⅲ	The ability to present research results (e.g. in international and domestic conferences) are acquired in the student's own research. Specifically, it announces the research and sends in conformity with the progress of the research of the student. It measures extension of its ability.	1					○	
	Internship Ⅲ	In this course, the students work in commercial companies (or research organizations) for a period to cultivate their problem-solving capability in the society. Practicing more a long series of internship is done for 2-3 months. A joint research is acceptable.	1						
	Internship IV	In this course, the students work in commercial companies (or research organizations) for a period to cultivate their problem-solving capability in the society. Practicing more a long series of internship is done for 2-3 months. A joint research is acceptable.	1						

5 . Information Desk
受付窓口

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