

## Core Inorganic Chemistry (2.0credits) (コア無機化学特論)

Course Type	Basic Courses
Division at course	Master's Course
Class Format	Lecture
Course Name	Graduate Chemistry
Starts 1	1 Autumn Semester
Lecturer	Faculty of Chemistry

### Course Purpose

In this course, students will learn theoretical concepts that control structures and reaction pathways of chemical compounds without using complicated mathematics. For this purpose, students will learn basic concepts of the group theory in the first half of this course. Students will learn various point groups, structures of character tables, and basic mathematical techniques related to the group theory.

Then students will learn first- and second-order Jahn-Teller effects that are related to the distortions of ground-state structures and the activation energy of chemical reactions. Finally, the students will learn symmetry rules that determine the pathways of reactions.

By taking this course, students will understand (1) symmetry elements and symmetry operations of various point groups; (2) methods of mathematical calculations using character tables; (3) method to draw molecular orbital by obtaining group orbitals; (4) analyses of normal mode vibrations of simple molecules by leaning the whole molecule method and internal coordinate method; (5) judgment if a given dipole transition is allowed or not; (6) determinations of ground-state structures of various compounds; and (7) judgment if a given reaction is allowed to proceed thermally or not. Students also learn about basic mathematics related to the projection operators and the Great Orthogonality Theorem.

### Prerequisite Subjects

Undergraduate Quantum Chemistry and Inorganic Chemistry courses

### Course Topics

1. Symmetry elements / operations and point groups
2. Structure of character tables, reducible and irreducible representations, and direct product
3. Kugel Group and subgroup
4. Application of Group Theory 1: group orbital and molecular orbital
5. Application of Group Theory 2: analyses of normal mode vibrations and basic concepts of IR / Raman spectroscopy
6. Application of Group Theory 3: judgments of electronic / IR / Raman transitions
7. Application of Group Theory 4: Jahn-Teller Theorem and structures of compounds
8. Application of Group Theory 5: Allowed and forbidden reactions; Adiabaticity of concerted processes; Symmetry Rules and Principle of Least Motion

### Textbook

Theories for Structures and Reactions; A Practical Guide to the Physical Theories in Chemistry (by HDT)

### Reference book

S.F.A. Kettle, Symmetry and Structure – a Readable Group Theory for Chemists, Wiley, and other books referred to in the textbook.

### Additional Reading

### Grade Assessment

Students must obtain a score of 60 or higher to pass the course.

Grades : S:100-90, A:89-80, B:79-70, C:69-60, F:59-0.

## Core Inorganic Chemistry (2.0credits) (コア無機化学特論)

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Definition of F: Submission of less than 60% of all assignments and / or the result of the final examination.

Grading: Final examination (50%), assignments (50 %)

Notes

Contacting Faculty

E-mail / phone

## Core Organic Chemistry (2.0credits) (コア有機化学特論)

Course Type	Basic Courses
Division at course	Master's Course
Class Format	Lecture
Course Name	Graduate Chemistry
Starts 1	1 Spring Semester
Lecturer	Jiyoung SHIN Designated Associate Professor

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### Course Purpose

The purpose of this course is to learn some important features of basic/advanced organic chemistry. This course will assist the student to understand the intellectual roots of organic chemistry under the specific topics selectively chosen and to develop a knowledge and appreciation of structure, mechanism, reactions, and synthesis in organic chemistry.

### Prerequisite Subjects

Fundamental Chemistry I and II (undergraduate level)

### Course Topics

1. Molecular structures and Chemical Isomers
2. Chemical Reactivity of Organic Compounds
3. Extended Electron Systems and Benzene Derivatives
4. Organic Reactions and The Corresponding Mechanisms: Nucleophilic & Electrophilic Additions, Radical Reactions, Nucleophilic & Electrophilic Substitutions, Eliminations, Acid & Base-Mediated Reactions, and Reactions of Conjugate bases
5. Organic Reaction involving Organometallic Reagents

### Textbook

1. Organic Chemistry (Second edition), Jonathan Clayden, Nick Greeves, and Stuart Warren, Oxford, 2012.
2. Advanced Organic Chemistry (Part B: Reaction and Synthesis, Fifth Edition), Francis A. Carey, Richard J. Sundberg, Springer, 2007.

### Additional Reading

### Grade Assessment

Grades will be based on assessment of reports.

Grades: S": 100-90% , "A": 89-80% , "B": 79-70%, "C": 69-60%, "F": 59-0%.

### Notes

### Contacting Faculty

Students can communicate with their course instructor face-to-face either in the class or in the appointment time. Communication through the e-mail is also available.

## Core Physical Chemistry (2.0credits) (コア物理化学特論)

Course Type	Basic Courses
Division at course	Master's Course
Class Format	Lecture
Course Name	Graduate Chemistry
Starts 1	1 Autumn Semester
Lecturer	Peter BUTKO Designated Professor

### Course Purpose

The purpose of this course is to review formerly acquired knowledge in physical chemistry, and apply it to solving problems in chemistry and biochemistry. Solving problems in class and at home is the focus of this course, which aims to prepare students for future, more specialized physical chemistry courses.

### Prerequisite Subjects

Basic Physical Chemistry, Quantum Chemistry

### Course Topics

#### I. EQUILIBRIUM THERMODYNAMICS

- 1 Review of fundamental concepts and the three laws
- 2 Pure substances and simple mixtures
- 3 Chemical equilibrium

#### II. QUANTUM THEORY

- 5 Principles: the Schrodinger equation, the Born interpretation, the postulates
- 6 Techniques and applications: a particle in the box; vibration and rotation in 2D & 3D
- 7 Atomic structure and spectra: from hydrogenic atoms to complex atoms
- 8 Molecular structure: the Born-Oppenheimer approximation; valence-bond theory; molecular orbital theory; the Huckel approximation for polyatomic systems
- 9 Molecular symmetry
- 10 Molecular spectroscopy

#### III. STATISTICAL THERMODYNAMICS

- 12 Review of the concepts: the distribution of molecular states; the internal energy and the entropy; the canonical partition function
- 13 Applications: the molecular partition function; mean energies; molecular interactions in liquids; equilibrium constants

### Textbook

P. Atkins and J de Paula: Atkins' Physical Chemistry, 9th Ed., Oxford University Press, 2009

### Additional Reading

### Grade Assessment

Two exams: 100 points each

Final exam (comprehensive): 200

Homework: 100

TOTAL: 500

Grades: "S": 100-90% (450 or more points), "A": 89-80% (449-400 pts), "B": 79-70% (399-350 pts), "C": 69-60% (349-300 pts), "F": 59-0% (below 300 pts). Up to 50 extra (bonus) points can be earned for active class participation.

Students must obtain a score of 60% or higher to pass the course.

### Notes

### Contacting Faculty

Students can communicate with their lecturer face-to-face during lecture or office hours and via e-mail.

Prof. Peter BUTKO

Office: RCMS 104

Email: [pbutko@chem.nagoya-u.ac.jp](mailto:pbutko@chem.nagoya-u.ac.jp)

## Core Biochemistry (2.0credits) (コア生物化学特論)

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Course Type	Basic Courses
Division at course	Master's Course
Class Format	Lecture
Course Name	Graduate Chemistry
Starts 1	1 Spring Semester
Lecturer	Faculty of Chemistry

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### Course Purpose

The aim of this course is to gain an understanding of basic principles as well as the latest topics in various fields of biochemistry, including protein chemistry, peptide chemistry, nucleic acid chemistry, genetic engineering, molecular biology, bioinorganic chemistry, nanobioscience, bioengineering, structural biology, and bioinformatics.

### Prerequisite Subjects

#### Course Topics

1. protein chemistry, peptide chemistry
2. nucleic acid chemistry
3. genetic engineering, molecular biology
4. bioinorganic chemistry
5. nanobioscience, nanobiotechnology
6. bioengineering, bioinformatics
7. structural biology

#### Textbook

#### Additional Reading

#### Grade Assessment

Evaluation of Reports

Grade "S": 100-90% , "A": 89-80% , "B": 79-70%, "C": 69-60%, "F": 59-0%.

#### Notes

#### Contacting Faculty

In communicate with the instructor by face-to-face in the lecture or in the office hour, and by e-mail.

## Chemistry Seminar 1A (2.0credits) (化学系セミナー 1 A)

Course Type	Specialized Courses
Division at course	Master's Course
Class Format	Seminar
Course Name	Graduate Chemistry
Starts 1	1 Autumn Semester
Lecturer	Faculty of Chemistry

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### Course Purpose

The purpose of this course is to learn about research processes from various literatures.

### Prerequisite Subjects

### Course Topics

Presentation and discussion on recent relevant literatures

### Textbook

### Additional Reading

### Grade Assessment

Depends on research groups. Credits will be awarded to those students who score 60 or more. Grades are as follows: S:100 - 90, A:89 - 80, B:79 - 70, C:69 - 60, F:59 - 0.

### Notes

### Contacting Faculty

## Chemistry Seminar 1B (2.0credits) (化学系セミナー 1 B)

Course Type	Specialized Courses
Division at course	Master's Course
Class Format	Seminar
Course Name	Graduate Chemistry
Starts 1	1 Spring Semester
Lecturer	Faculty of Chemistry

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### Course Purpose

The purpose of this course is to learn about research processes and techniques from various literature sources.

### Prerequisite Subjects

### Course Topics

Presentation and discussion on topics in recent literature

### Textbook

### Additional Reading

### Grade Assessment

Depends on research groups. Credits will be awarded to those students who score 60 or more. Grades are as follows: S:100 - 90, A:89 - 80, B:79 - 70, C:69 - 60, F:59 - 0.

### Notes

### Contacting Faculty



## Chemistry Seminar 1C (2.0credits) (化学系セミナー 1 C)

Course Type	Specialized Courses
Division at course	Master's Course
Class Format	Seminar
Course Name	Graduate Chemistry
Starts 1	2 Autumn Semester
Lecturer	Faculty of Chemistry

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### Course Purpose

The purpose of this course is to learn about research processes and techniques from various literature sources.

### Prerequisite Subjects

### Course Topics

Presentation and discussion on recent relevant literature

### Textbook

### Additional Reading

### Grade Assessment

Depends on research groups. Credits will be awarded to those students who score 60 or more. Grades are as follows: S:100 - 90, A:89 - 80, B:79 - 70, C:69 - 60, F:59 - 0.

### Notes

### Contacting Faculty

## Chemistry Seminar 1D (2.0credits) (化学系セミナー 1 D)

Course Type	Specialized Courses
Division at course	Master's Course
Class Format	Seminar
Course Name	Graduate Chemistry
Starts 1	2 Spring Semester
Lecturer	Faculty of Chemistry

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### Course Purpose

The purpose of this course is to learn about research processes and techniques from various literature sources.

### Prerequisite Subjects

### Course Topics

Presentation and discussion on topics in recent literature

### Textbook

### Additional Reading

### Grade Assessment

Depends on research groups. Credits will be awarded to those students who score 60 or more. Grades are as follows: S:100 - 90, A:89 - 80, B:79 - 70, C:69 - 60, F:59 - 0.

### Notes

### Contacting Faculty

Course Type	Specialized Courses
Division at course	Master's Course
Class Format	Lecture
Course Name	Graduate Chemistry
Starts 1	1 Spring Semester
Lecturer	Faculty of Chemistry

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### Course Purpose

The course consists of a series of lectures on chemical reactions, and microstructure and property control of inorganic and related materials (especially advanced nanostructured-materials) based on solid state chemistry and nanotechnology.

### Prerequisite Subjects

Inorganic Chemistry 1, Inorganic Chemistry 2, Inorganic Chemistry 3, Chemistry of Inorganic Materials 1, Chemistry of Inorganic Materials 2

### Course Topics

1. Introduction
2. Solid oxide fuel cells: Materials, processing and applications
3. Advanced ferroic materials: Processing, characterization and applications
4. Oxide electronics: Film growth, characterization and device applications
5. Novel nanocarbon materials: Characteristics and applications
6. Nanoporous materials: Structures and functions
7. Bioceramics: Ceramics in medicine, biology and biomimetics
8. Composites materials for reconstruction of biological tissues

### Textbook

Prints are distributed when necessary.

### Additional Reading

- [1] "Nanostructures and Nanomaterials: Synthesis, Properties, and Applications (2nd Edition)", Guozhong Cao and Ying Wang, World Scientific, 2010.
- [2] "Ceramic Materials: Science and Engineering (1st Edition)", C. Barry Carter, M. Grant Norton, Springer, 2007.
- [3] "Solid State Chemistry: An Introduction (3rd Edition)", Lasley E. Smart, Elaine A. Moore, Taylor and Francis, 2005.

### Grade Assessment

Reports and examination

Students must obtain a score of 60 or higher to pass the course.

Grades: S: 100-90, A: 89-80, B: 79-70, C: 69-60, F: 59-0.

### Notes

### Contacting Faculty

Lecturers hold office hours after lectures.

## Advanced Organic Chemistry (2.0credits) (アドバンス有機化学特論)

Course Type	Specialized Courses
Division at course	Master's Course
Class Format	Lecture
Course Name	Graduate Chemistry
Starts 1	1 Spring Semester
Lecturer	Faculty of Chemistry

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### Course Purpose

The purpose of this course is to present an overview of cutting-edge organic chemistry, and learn important principles and facets of modern chemistry. The course includes sophisticated catalysts and reagents (organic-based and metal-based) for making useful compounds, designer functional organic molecules with various optoelectronic properties, and synthesis of natural products and biologically active complex molecules.

### Prerequisite Subjects

Organic Chemistry 1-5

### Course Topics

1. Organocatalysts for Green Chemistry2. Chiral Catalysts for Enantioselective Synthesis3. Transition Metal Catalysts for Unreactive Bond Activation4. Synthesis of Optoelectronic Materials5. Synthesis of Natural Products and Biologically Active Compounds

### Textbook

None

### Additional Reading

Organic Chemistry: Structure and Function 6th ed. K.Peter C. Vollhardt, Neil E. Schore

### Grade Assessment

Grades will be based on reports.Grades: "S": 100-90% , "A": 89-80% , "B": 79-70%, "C": 69-60%, "F": 59-0%.

### Notes

### Contacting Faculty

Students can communicate with their lecturer face-to-face during lecture or office hours, and via e-mail.

## Advanced Physical Chemistry (2.0credits) (アドバンス物理化学特論)

Course Type	Specialized Courses
Division at course	Master's Course
Class Format	Lecture
Course Name	Graduate Chemistry
Starts 1	1 Autumn Semester
Lecturer	Faculty of Chemistry

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### Course Purpose

This course is designed as a broad survey of modern topics in physical chemistry through an omnibus form of lectures conducted by Professors, Associate Professors, and Lecturers. The teachers will provide you recent stimulative topics in physical chemistry such as fullerenes, carbon nanotubes, organometallics, nanoparticles, electronic devices, catalysts, solar cells, etc. All the lectures will help you to have your own overview of physical chemistry for understanding the essence of the modern physical chemistry.

### Prerequisite Subjects

The course assumes students have background knowledge of general principles of chemistry, inorganic chemistry, organic chemistry, quantum chemistry, thermodynamics, chemical kinetics and electrochemistry.

### Course Topics

The lecturers will provide you specifics from the cutting-edge topics such as surfaces/interfaces chemistry, science of nanomaterials, electronic band structure, laser chemistry, computer simulation, catalysis chemistry, molecule-based spintronics, solvation theory, etc.

### Textbook

In case of necessity, printed handouts will be distributed in each lecture.

### Additional Reading

TBA

### Grade Assessment

Required work consists of homework assignments.

Students must submit reports to each teacher.

Credits will be awarded to those students who score 60 or more.

Grades are as follows: S:100 - 90, A:89 - 80, B:79 - 70, C:69 - 60, F:59 - 0.

### Notes

### Contacting Faculty

The teacher in charge of each class will answer student's questions individually.

Office hours: Monday to Friday, 9:00 to 17:00.

(An appointment must be required by e-mail.)

Course Type	Specialized Courses
Division at course	Master's Course
Class Format	Lecture
Course Name	Graduate Chemistry
Starts 1	1 Spring Semester
Lecturer	Faculty of Chemistry

### Course Purpose

In chemical reactions in solution, solute molecules are surrounded by a large number of solvent molecules. To elucidate such a system theoretically, we have to perform quantum mechanical (QM) calculation with solvation effect. In this class, theoretical concepts important for QM methods coupled with solvation theories will be covered.

### Prerequisite Subjects

Quantum Chemistry I & II

Participants should have some familiarity with electronic-structure theory and/or molecular dynamics techniques.

### Course Topics

1. Born-Oppenheimer approximation
2. LCAO-MO theory; Hartree-Fock theory
3. Electron correlation problem
4. Basis sets in quantum chemical calculations
5. Density-based methods: Kohn-Sham theory, density functional theory (DFT)
6. Molecular mechanics
7. Solvation theories: How to treat large number of particles (PCM, QM-MM/MD, and RISM)

### Textbook

Self-made scriptum

### Additional Reading

Modern Quantum Chemistry: Introduction to Advanced Electronic Structure Theory (A. Szabo and N.S. Ostlund), Dover Publications, Inc.; Computer Simulation of Liquids (M. P. Allen and D. J. Tildesley), Oxford University Press, and a self-prepared script

### Grade Assessment

Grades will be based on examinations and reports.

Credits will be awarded to those students who score 60 or more.

Grades are as follows: S:100 - 90, A:89 - 80, B:79 - 70, C:69 - 60, F:59 - 0.

### Notes

Contacting Faculty

## Advanced Polymer Chemistry (2.0credits) (アドバンス高分子化学)

Course Type	Specialized Courses
Division at course	Master's Course
Class Format	Lecture
Course Name	Graduate Chemistry
Starts 1	1 Autumn Semester
Lecturer	Faculty of Chemistry

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### Course Purpose

The purpose of this course is to learn important topics in advanced polymer science. The course covers cutting-edge polymer research in the synthesis, structures, functions, and properties of polymer, as well as fundamental principles for understanding polymer-based advanced materials science.

### Prerequisite Subjects

Organic Chemistry, Physical Chemistry, Analytical Chemistry, Polymer Chemistry

### Course Topics

1. Precision Polymer Synthesis 2. Living/Controlled Radical Polymerization 3. Living Anionic Polymerization 4. Living Cationic Polymerization 5. Stereospecific Coordination Polymerization 6. Synthesis and Structures of Helical Polymers 7. Synthesis and Structures of Helical Polymers 8. Application of Helical Polymers 9. Supramolecular Polymers 10. Observations of Polymers by Scanning Probe Microscopy 11. Characterization and Separation of Polymers 12. Mesoscopic Structures of Polymers –Real Space vs Reciprocal Space 13. Real Space Observation by Transmission Electron Microscopy 14. Reciprocal Space Observation by Various Scattering Methods 15. Viscoelastic Properties of Polymers

### Textbook

### Additional Reading

Controlled and Living Polymerizations, A. H. E. Mueller, K. Matyjaszewski, Eds., Wiley-VCH

### Grade Assessment

Students must obtain a score of 60 or higher to pass the course. Grades: S:100-90, A:89-80, B:79-70, C:69-60, F:59-0.

### Notes

### Contacting Faculty

## Experiments and Exercises in Chemistry (8.0credits) (化学系特別実験及び演習)

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Course Type	Specialized Courses
Division at course	Master's Course
Class Format	Experiment and Practice
Course Name	Graduate Chemistry
Starts 1	1 Spring and Autumn Semester
Lecturer	Faculty of Chemistry

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### Course Purpose

This course involves exercises and experiments in each research group.

### Prerequisite Subjects

### Course Topics

### Textbook

### Additional Reading

### Grade Assessment

Credits will be awarded to those students who score 60 or more. Grades are as follows: S:100 - 90, A:89 - 80, B:79 - 70, C:69 - 60, F:59 - 0.

### Notes

### Contacting Faculty



## Advanced Lectures on Scientific English (1.0credits) (科学技術英語特論)

Course Type	Comprehensive engineering courses
Division at course	Master's Course
Class Format	Lecture
Course Name	Graduate Chemistry
Starts 1	1 Autumn Semester
Lecturer	Part-time Faculty

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### Course Purpose

In this course, students will improve their ability to summarize research findings in English, submit a paper to an international academic journal, and make an English presentation at an international conference.

### Prerequisite Subjects

Various subjects relating to English

### Course Topics

1. Grammar for writing a scientific paper 2. How to write scientific papers 3. Public speaking before international audiences 4. Self-evaluation: writing effective CVs and job applications 5. E-mail for technical and business purposes

### Textbook

### Additional Reading

Ishida et al., How to Write Scientific English and Make Presentations (in Japanese), Corona Publishing Co. Ltd.

### Grade Assessment

Grades will be based on assessment of presentation quality, active participation in audience discussion, and attendance.

### Notes

### Contacting Faculty

## Introduction to Academic Communication (1.0credits) (コミュニケーション学)

Course Type	Comprehensive engineering courses		
Division at course	Master's Course		
Class Format	Lecture		
Course Name	Molecular and Macromolecular Chemistry	Materials Chemistry	Biomolecular Engineering
	Applied Physics	Materials Physics	Materials Design Innovation Engineering
	Materials Process Engineering	Chemical Systems Engineering	Electrical Engineering
	Electronics	Information and Communication Engineering	Mechanical Systems Engineering
	Micro-Nano Mechanical Science and Engineering	Aerospace Engineering	Department of Energy Engineering
	Department of Applied Energy	Civil and Environmental Engineering	Graduate Chemistry
	Graduate Chemistry	Automotive Engineering	Automotive Engineering
	Civil and Environmental Engineering Graduate		
Starts 1	1 Autumn Semester	1 Autumn Semester	1 Autumn Semester
	1 Autumn Semester	1 Autumn Semester	1 Autumn Semester
	1 Autumn Semester	1 Autumn Semester	1 Autumn Semester
	1 Autumn Semester	1 Autumn Semester	1 Autumn Semester
	1 Autumn Semester	1 Autumn Semester	1 Autumn Semester
	1 Autumn Semester	1 Autumn Semester	1 Autumn Semester
	1 Autumn Semester	1 Autumn Semester	1 Autumn Semester
	1 Autumn Semester		
Lecturer	ReikoFURUYA Associate Professor		

### Course Purpose

This course is intended to help students learn the skills necessary for making an effective presentation in a language (either Japanese or English) different from their native tongue. Japanese students will make presentations in English, and international students in Japanese.

### Prerequisite Subjects

### Course Topics

(1) Observing video-taped presentations:By watching model presentations, students will see how an effective presentation is made and learn techniques useful for their own presentations. :(2) Making a presentation:By using presentation techniques discussed

### Textbook

none

### Additional Reading

Please refer to the Japanese version of this syllabus.

### Grade Assessment

Evaluation will be based on presentations and class participation.:

### Notes

### Contacting Faculty

## Research Internship 1 U2 (2.0credits) (研究インターンシップ 1 U2)

Course Type	Comprehensive engineering courses
Division at course	Master's Course
Class Format	Practice
Course Name	Graduate Chemistry
Starts 1	1 Spring and Autumn Semester
Lecturer	Faculty of Chemistry

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### Course Purpose

Research internship is different from conventional internship for a working experience. Staffs in the faculty and instructors in a company cooperate with each other to set up research themes, and supervise a long-term internship for 1-6 months. This course aims at training of a person who has ability for research and development in not only a specialized field but also a multidisciplinary field, and a leader capable of making a proper judgment in a research project.

### Prerequisite Subjects

### Course Topics

A student applies for a theme for research set up under the cooperation of a company and Nagoya University. Students should attend at the lecture at the university on the duty of confidentiality and the protection of intellectual property rights before starting the internship.

### Textbook

not specified.

### Additional Reading

not specified.

### Grade Assessment

The credits will be given to the students who have had the working days less than or equal to 20 days in the internship company.

### Notes

### Contacting Faculty

The questions will be answered by the direct supervisors as needed at the internship.

## Research Internship 1 U3 (3.0credits) (研究インターンシップ 1 U3)

Course Type	Comprehensive engineering courses
Division at course	Master's Course
Class Format	Practice
Course Name	Graduate Chemistry
Starts 1	1 Spring and Autumn Semester
Lecturer	Faculty of Chemistry

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### Course Purpose

Research internship is different from conventional internship for a working experience. Staffs in the faculty and instructors in a company cooperate with each other to set up research themes, and supervise a long-term internship for 1-6 months. This course aims at training of a person who has ability for research and development in not only a specialized field but also a multidisciplinary field, and a leader capable of making a proper judgment in a research project.

### Prerequisite Subjects

### Course Topics

A student applies for a theme for research set up under the cooperation of a company and Nagoya University. Students should attend at the lecture at the university on the duty of confidentiality and the protection of intellectual property rights before starting the internship.

### Textbook

not specified.

### Additional Reading

not specified

### Grade Assessment

The credits will be given to the students who have had the working days between 21 and 40 days in the internship company.

### Notes

### Contacting Faculty

The questions will be answered by the direct supervisors as needed at the internship.

## Research Internship 1 U4 (4.0credits) (研究インターンシップ 1 U4)

Course Type	Comprehensive engineering courses
Division at course	Master's Course
Class Format	Practice
Course Name	Graduate Chemistry
Starts 1	1 Spring and Autumn Semester
Lecturer	Faculty of Chemistry

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### Course Purpose

Research internship is different from conventional internship for a working experience. Staffs in the faculty and instructors in a company cooperate with each other to set up research themes, and supervise a long-term internship for 1-6 months. This course aims at training of a person who has ability for research and development in not only a specialized field but also a multidisciplinary field, and a leader capable of making a proper judgment in a research project.

### Prerequisite Subjects

### Course Topics

A student applies for a theme for research set up under the cooperation of a company and Nagoya University. Students should attend at the lecture at the university on the duty of confidentiality and the protection of intellectual property rights before starting the internship.

### Textbook

not specified.

### Additional Reading

not specified.

### Grade Assessment

The credits will be given to the students who have had the working days between 41 and 60 days in the internship company.

### Notes

### Contacting Faculty

The questions will be answered by the direct supervisors as needed at the internship.

## Research Internship 1 U6 (6.0credits) (研究インターンシップ 1 U6)

Course Type	Comprehensive engineering courses
Division at course	Master's Course
Class Format	Practice
Course Name	Graduate Chemistry
Starts 1	1 Spring and Autumn Semester
Lecturer	Faculty of Chemistry

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### Course Purpose

Research internship is different from conventional internship for a working experience. Staffs in the faculty and instructors in a company cooperate with each other to set up research themes, and supervise a long-term internship for 1-6 months. This course aims at training of a person who has ability for research and development in not only a specialized field but also a multidisciplinary field, and a leader capable of making a proper judgment in a research project.

### Prerequisite Subjects

### Course Topics

A student applies for a theme for research set up under the cooperation of a company and Nagoya University. Students should attend at the lecture at the university on the duty of confidentiality and the protection of intellectual property rights before starting the internship.

### Textbook

not specified.

### Additional Reading

not specified.

### Grade Assessment

The credits will be given to the students who have had the working days between 61 and 80 days in the internship company.

### Notes

### Contacting Faculty

The questions will be answered by the direct supervisors as needed at the internship.

## Research Internship 1 U8 (8.0credits) (研究インターンシップ 1 U8)

Course Type	Comprehensive engineering courses
Division at course	Master's Course
Class Format	Practice
Course Name	Graduate Chemistry
Starts 1	1 Spring and Autumn Semester
Lecturer	Faculty of Chemistry

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### Course Purpose

Research internship is different from conventional internship for a working experience. Staffs in the faculty and instructors in a company cooperate with each other to set up research themes, and supervise a long-term internship for 1-6 months. This course aims at training of a person who has ability for research and development in not only a specialized field but also a multidisciplinary field, and a leader capable of making a proper judgment in a research project.

### Prerequisite Subjects

### Course Topics

A student applies for a theme for research set up under the cooperation of a company and Nagoya University. Students should attend at the lecture at the university on the duty of confidentiality and the protection of intellectual property rights before starting the internship.

### Textbook

not specified.

### Additional Reading

not specified.

### Grade Assessment

The credits will be given to the students who have had the working days more than or equal to 81 days in the internship company.

### Notes

### Contacting Faculty

The questions will be answered by the direct supervisors as needed at the internship.

## Laboratory Visit 1 U2 (2.0credits) (研究室ローテーション 1 U2)

Course Type	Comprehensive engineering courses
Division at course	Master's Course
Class Format	Practice
Course Name	Graduate Chemistry
Starts 1	1 Spring and Autumn Semester
Lecturer	Faculty of Chemistry

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### Course Purpose

The aim is to expand the ability as a researcher by conducting thesis research at different laboratories.

### Prerequisite Subjects

None in particular

### Course Topics

conducting thesis research at different laboratories U2, U3; short term basic research, U4, U6, U8; long term advanced research

### Textbook

None in particular

### Additional Reading

None in particular

### Grade Assessment

Credits will be awarded to those students who score 'Pass'. Thesis supervisor will make overall evaluation based on 1) credit hours, 2) research report and 3) evaluation by the host researcher.

### Notes

Contacting Faculty



## Laboratory Visit 1 U3 (3.0credits) (研究室ローテーション 1 U3)

Course Type	Comprehensive engineering courses
Division at course	Master's Course
Class Format	Practice
Course Name	Graduate Chemistry
Starts 1	1 Spring and Autumn Semester
Lecturer	Faculty of Chemistry

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### Course Purpose

The aim is to expand the ability as a researcher by conducting thesis research at different laboratories.

### Prerequisite Subjects

None in particular

### Course Topics

conducting thesis research at different laboratories

U2, U3; short term basic research, U4, U6, U8; long term advanced research

### Textbook

None in particular

### Additional Reading

None in particular

### Grade Assessment

Credits will be awarded to those students who score 'Pass'.

Thesis supervisor will make overall evaluation based on 1) credit hours, 2) research report and 3) evaluation by the host researcher.

### Notes

Contacting Faculty

## Laboratory Visit 1 U4 (4.0credits) (研究室ローテーション 1 U4)

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Course Type	Comprehensive engineering courses
Division at course	Master's Course
Class Format	Practice
Course Name	Graduate Chemistry
Starts 1	1 Spring and Autumn Semester
Lecturer	Faculty of Chemistry

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### Course Purpose

The aim is to expand the ability as a researcher by conducting thesis research at different laboratories.

### Prerequisite Subjects

None in particular

### Course Topics

conducting thesis research at different laboratories

U2, U3; short term basic research, U4, U6, U8; long term advanced research

### Textbook

None in particular

### Additional Reading

None in particular

### Grade Assessment

Credits will be awarded to those students who score 'Pass'.

Thesis supervisor will make overall evaluation based on 1) credit hours, 2) research report and 3) evaluation by the host researcher.

### Notes

Contacting Faculty

## Laboratory Visit 1 U6 (6.0credits) (研究室ローテーション 1 U6)

Course Type	Comprehensive engineering courses
Division at course	Master's Course
Class Format	Practice
Course Name	Graduate Chemistry
Starts 1	1 Spring and Autumn Semester
Lecturer	Faculty of Chemistry

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### Course Purpose

The aim is to expand the ability as a researcher by conducting thesis research at different laboratories.

### Prerequisite Subjects

None in particular

### Course Topics

conducting thesis research at different laboratories U2, U3; short term basic research, U4, U6, U8; long term advanced research

### Textbook

None in particular

### Additional Reading

None in particular

### Grade Assessment

Credits will be awarded to those students who score 'Pass'. Thesis supervisor will make overall evaluation based on 1) credit hours, 2) research report and 3) evaluation by the host researcher.

### Notes

Contacting Faculty

## Laboratory Visit 1 U8 (8.0credits) (研究室ローテーション 1 U8)

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Course Type	Comprehensive engineering courses
Division at course	Master's Course
Class Format	Practice
Course Name	Graduate Chemistry
Starts 1	1 Spring and Autumn Semester
Lecturer	Faculty of Chemistry

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### Course Purpose

The aim is to expand the ability as a researcher by conducting thesis research at different laboratories.

### Prerequisite Subjects

None in particular

### Course Topics

conducting thesis research at different laboratories U2, U3; short term basic research, U4, U6, U8; long term advanced research

### Textbook

None in particular

### Additional Reading

None in particular

### Grade Assessment

Credits will be awarded to those students who score 'Pass'. Thesis supervisor will make overall evaluation based on 1) credit hours, 2) research report and 3) evaluation by the host researcher.

### Notes

Contacting Faculty

## Chemistry Seminar 2A (2.0credits) (化学系セミナー2A)

Course Type	Specialized Courses
Division at course	Doctor's Course
Class Format	Seminar
Course Name	Graduate Chemistry
Starts 1	1 Autumn Semester
Lecturer	Faculty of Chemistry

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### Course Purpose

In this course, students will learn about the research process and technique from literatures.

### Prerequisite Subjects

### Course Topics

Presentation and discussion on the recent literatures

### Textbook

### Additional Reading

### Grade Assessment

Depends on research groups. Credits will be awarded to those students who score 60 or more. Grades are as follows: S:100 - 90, A:89 - 80, B:79 - 70, C:69 - 60, F:59 - 0.

### Notes

### Contacting Faculty

## Chemistry Seminar 2B (2.0credits) (化学系セミナー2B)

Course Type	Specialized Courses
Division at course	Doctor's Course
Class Format	Seminar
Course Name	Graduate Chemistry
Starts 1	1 Spring Semester
Lecturer	Faculty of Chemistry

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### Course Purpose

The purpose of this course is to learn about research processes and techniques from various literature sources.

### Prerequisite Subjects

### Course Topics

Presentation and discussion on topics in recent literature

### Textbook

### Additional Reading

### Grade Assessment

Depends on research groups. Credits will be awarded to those students who score 60 or more. Grades are as follows: S:100 - 90, A:89 - 80, B:79 - 70, C:69 - 60, F:59 - 0.

### Notes

### Contacting Faculty

## Chemistry Seminar 2C (2.0credits) (化学系セミナー2C)

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Course Type	Specialized Courses
Division at course	Doctor's Course
Class Format	Seminar
Course Name	Graduate Chemistry
Starts 1	2 Autumn Semester
Lecturer	Faculty of Chemistry

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### Course Purpose

The purpose of this course is to learn about research processes and techniques from various literature sources.

### Prerequisite Subjects

### Course Topics

Presentation and discussion on topics in recent literature

### Textbook

### Additional Reading

### Grade Assessment

Depends on research groups. Credits will be awarded to those students who score 60 or more. Grades are as follows: S:100 - 90, A:89 - 80, B:79 - 70, C:69 - 60, F:59 - 0.

### Notes

### Contacting Faculty

## Chemistry Seminar 2D (2.0credits) (化学系セミナー2D)

Course Type	Specialized Courses
Division at course	Doctor's Course
Class Format	Seminar
Course Name	Graduate Chemistry
Starts 1	2 Spring Semester
Lecturer	Faculty of Chemistry

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### Course Purpose

The purpose of this course is to learn about research processes and techniques from various literature sources.

### Prerequisite Subjects

### Course Topics

Presentation and discussion on topics in recent literature

### Textbook

### Additional Reading

### Grade Assessment

Depends on research groups. Credits will be awarded to those students who score 60 or more. Grades are as follows: S:100 - 90, A:89 - 80, B:79 - 70, C:69 - 60, F:59 - 0.

### Notes

### Contacting Faculty



## Chemistry Seminar 2E (2.0credits) (化学系セミナー2E)

Course Type	Specialized Courses
Division at course	Doctor's Course
Class Format	Seminar
Course Name	Graduate Chemistry
Starts 1	3 Autumn Semester
Lecturer	Faculty of Chemistry

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### Course Purpose

The purpose of this course is to learn about research processes and techniques from various literature sources.

### Prerequisite Subjects

### Course Topics

Presentation and discussion on topics in recent literature

### Textbook

### Additional Reading

### Grade Assessment

Depends on research groups. Credits will be awarded to those students who score 60 or more. Grades are as follows: S:100 - 90, A:89 - 80, B:79 - 70, C:69 - 60, F:59 - 0.

### Notes

### Contacting Faculty

## Topics in International Chemistry 10 (1.0credits) (国際化学特論 )

Course Type	Specialized Courses
Division at course	Doctor's Course
Class Format	Lecture
Course Name	Graduate Chemistry
Starts 1	1 Spring and Autumn Semester
Starts 2	2 Spring and Autumn Semester
Lecturer	InternationalFaculty

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### Course Purpose

The purpose of the course is to learn about the latest international trends in the field of chemistry. Lecturers for this course are professors of chemistry invited from overseas, and they teach courses in their specialties.

### Prerequisite Subjects

### Course Topics

Lecturer names, class dates, and other details will be notified in due course.

### Textbook

None

### Additional Reading

### Grade Assessment

Credits will be awarded to those students who score 60 or more. Grades are as follows: S:100 - 90, A:89 - 80, B:79 - 70, C:69 - 60, F:59 - 0.

### Notes

### Contacting Faculty

## Topics in International Chemistry 11 (1.0credits) (国際化学特論 )

Course Type	Specialized Courses
Division at course	Doctor's Course
Class Format	Lecture
Course Name	Graduate Chemistry
Starts 1	1 Spring and Autumn Semester
Starts 2	2 Spring and Autumn Semester
Lecturer	InternationalFaculty

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### Course Purpose

The purpose of the course is to learn about the latest international trends in the field of chemistry. Lecturers for this course are professors of chemistry invited from overseas, and they teach courses in their specialties.

### Prerequisite Subjects

### Course Topics

Lecturer names, class dates, and other details will be notified in due course.

### Textbook

None

### Additional Reading

### Grade Assessment

Credits will be awarded to those students who score 60 or more. Grades are as follows: S:100 - 90, A:89 - 80, B:79 - 70, C:69 - 60, F:59 - 0.

### Notes

### Contacting Faculty

## Topics in International Chemistry 12 (1.0credits) (国際化学特論 )

Course Type	Specialized Courses
Division at course	Doctor's Course
Class Format	Lecture
Course Name	Graduate Chemistry
Starts 1	1 Spring and Autumn Semester
Starts 2	2 Spring and Autumn Semester
Lecturer	InternationalFaculty

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### Course Purpose

The purpose of the course is to learn about the latest international trends in the field of chemistry. Lecturers for this course are professors of chemistry invited from overseas, and they teach courses in their specialties.

### Prerequisite Subjects

### Course Topics

Lecturer names, class dates, and other details will be notified in due course.

### Textbook

None

### Additional Reading

### Grade Assessment

Credits will be awarded to those students who score 60 or more. Grades are as follows: S:100 - 90, A:89 - 80, B:79 - 70, C:69 - 60, F:59 - 0.

### Notes

### Contacting Faculty

## Advanced Lectures on Scientific English (1.0credits) (科学技術英語特論)

Course Type	Comprehensive engineering courses
Division at course	Doctor's Course
Class Format	Lecture
Course Name	Graduate Chemistry
Starts 1	1 Autumn Semester
Starts 2	2 Autumn Semester
Lecturer	Part-time Faculty

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### Course Purpose

In this course, students will improve their ability to summarize research findings in English, submit a paper to an international academic journal, and make an English presentation at an international conference.

### Prerequisite Subjects

Various subjects relating to English

### Course Topics

1. Grammar for writing a scientific paper 2. How to write scientific papers 3. Public speaking for international audiences 4. Self-evaluation: writing effective CVs and job applications 5. E-mail for technical and business purposes

### Textbook

### Additional Reading

Ishida et al., How to Write Scientific English and Make Presentations (in Japanese), Corona Publishing Co. Ltd.

### Grade Assessment

Grades will be based on assessment of presentation quality, active participation discussions, and attendance.

### Notes

### Contacting Faculty

## Introduction to Academic Communication (1.0credits) (コミュニケーション学)

Course Type	Comprehensive engineering courses		
Division at course	Doctor's Course		
Class Format	Lecture		
Course Name	Molecular and Macromolecular Chemistry	Materials Chemistry	Biomolecular Engineering
	Applied Physics	Materials Physics	Materials Design Innovation Engineering
	Materials Process Engineering	Chemical Systems Engineering	Electrical Engineering
	Electronics	Information and Communication Engineering	Mechanical Systems Engineering
	Micro-Nano Mechanical Science and Engineering	Aerospace Engineering	Department of Energy Engineering
	Department of Applied Energy	Civil and Environmental Engineering	Graduate Chemistry
	Graduate Chemistry	Automotive Engineering	Automotive Engineering
	Civil and Environmental Engineering Graduate		
Starts 1	1 Autumn Semester	1 Autumn Semester	1 Autumn Semester
	1 Autumn Semester	1 Autumn Semester	1 Autumn Semester
	1 Autumn Semester	1 Autumn Semester	1 Autumn Semester
	1 Autumn Semester	1 Autumn Semester	1 Autumn Semester
	1 Autumn Semester	1 Autumn Semester	1 Autumn Semester
	1 Autumn Semester	1 Autumn Semester	1 Autumn Semester
	1 Autumn Semester	1 Autumn Semester	1 Autumn Semester
	1 Autumn Semester		
Lecturer	ReikoFURUYA Associate Professor		

### Course Purpose

This course is intended to help students learn the skills necessary for making an effective presentation in a language (either Japanese or English) different from their native tongue. Japanese students will make presentations in English, and international students in Japanese.

### Prerequisite Subjects

### Course Topics

(1) Observing video-taped presentations:By watching model presentations, students will see how an effective presentation is made and learn techniques useful for their own presentations. :(2) Making a presentation:By using presentation techniques discussed

### Textbook

none

### Additional Reading

Please refer to the Japanese version of this syllabus.

### Grade Assessment

Evaluation will be based on presentations and class participation.:

### Notes

### Contacting Faculty

## Research Internship2 U2 (2.0credits) (研究インターンシップ 2 U2)

Course Type	Comprehensive engineering courses
Division at course	Doctor's Course
Class Format	Practice
Course Name	Graduate Chemistry
Starts 1	1 Spring and Autumn Semester
Lecturer	Faculty of Chemistry

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### Course Purpose

Research internship is different from conventional internship for a working experience. Staffs in the faculty and instructors in a company cooperate with each other to set up research themes adequate to the doctoral course, and supervise a long-term internship for 1-6 months. This course aims at training of a person who has ability for an advanced research and development in not only a specialized field but also a multidisciplinary field, and a leader capable of making a proper judgment in a research project.

### Prerequisite Subjects

### Course Topics

A student applies for a theme for research set up under the cooperation of a company and Nagoya University. Students should attend at the lecture at the university on the duty of confidentiality and the protection of intellectual property rights before starting the internship.

### Textbook

not specified.

### Additional Reading

### Grade Assessment

The credits will be given to the students who have had the working days less than or equal to 20 days in the internship company.

### Notes

### Contacting Faculty

The questions will be answered by the direct supervisors as needed at the internship.

## Research Internship2 U3 (3.0credits) (研究インターンシップ 2 U3)

Course Type	Comprehensive engineering courses
Division at course	Doctor's Course
Class Format	Practice
Course Name	Graduate Chemistry
Starts 1	1 Spring and Autumn Semester
Lecturer	Faculty of Chemistry

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### Course Purpose

Research internship is different from conventional internship for a working experience. Staffs in the faculty and instructors in a company cooperate with each other to set up research themes adequate to the doctoral course, and supervise a long-term internship for 1-6 months. This course aims at training of a person who has ability for an advanced research and development in not only a specialized field but also a multidisciplinary field, and a leader capable of making a proper judgment in a research project.

### Prerequisite Subjects

### Course Topics

A student applies for a theme for research set up under the cooperation of a company and Nagoya University. Students should attend at the lecture at the university on the duty of confidentiality and the protection of intellectual property rights before starting the internship.

### Textbook

not specified.

### Additional Reading

not specified.

### Grade Assessment

The credits will be given to the students who have had the working days between 21 and 40 days in the internship company.

### Notes

### Contacting Faculty

The questions will be answered by the direct supervisors as needed at the internship.



## Research Internship2 U4 (4.0credits) (研究インターンシップ 2 U4)

Course Type	Comprehensive engineering courses
Division at course	Doctor's Course
Class Format	Practice
Course Name	Graduate Chemistry
Starts 1	1 Spring and Autumn Semester
Lecturer	Faculty of Chemistry

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### Course Purpose

Research internship is different from conventional internship for a working experience. Staffs in the faculty and instructors in a company cooperate with each other to set up research themes adequate to the doctoral course, and supervise a long-term internship for 1-6 months. This course aims at training of a person who has ability for an advanced research and development in not only a specialized field but also a multidisciplinary field, and a leader capable of making a proper judgment in a research project.

### Prerequisite Subjects

### Course Topics

A student applies for a theme for research set up under the cooperation of a company and Nagoya University. Students should attend at the lecture at the university on the duty of confidentiality and the protection of intellectual property rights before starting the internship.

### Textbook

not specified.

### Additional Reading

not specified.

### Grade Assessment

The credits will be given to the students who have had the working days between 41 and 60 days in the internship company.

### Notes

### Contacting Faculty

The questions will be answered by the direct supervisors as needed at the internship.

## Research Internship2 U6 (6.0credits) (研究インターンシップ 2 U6)

Course Type	Comprehensive engineering courses
Division at course	Doctor's Course
Class Format	Practice
Course Name	Graduate Chemistry
Starts 1	1 Spring and Autumn Semester
Lecturer	Faculty of Chemistry

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### Course Purpose

Research internship is different from conventional internship for a working experience. Staffs in the faculty and instructors in a company cooperate with each other to set up research themes adequate to the doctoral course, and supervise a long-term internship for 1-6 months. This course aims at training of a person who has ability for an advanced research and development in not only a specialized field but also a multidisciplinary field, and a leader capable of making a proper judgment in a research project.

### Prerequisite Subjects

not specified.

### Course Topics

A student applies for a theme for research set up under the cooperation of a company and Nagoya University. Students should attend at the lecture at the university on the duty of confidentiality and the protection of intellectual property rights before starting the internship.

### Textbook

not specified.

### Additional Reading

not specified.

### Grade Assessment

The credits will be given to the students who have had the working days between 61 and 80 days in the internship company.

### Notes

### Contacting Faculty

The questions will be answered by the direct supervisors as needed at the internship.

## Research Internship2 U8 (8.0credits) (研究インターンシップ 2 U8)

Course Type	Comprehensive engineering courses
Division at course	Doctor's Course
Class Format	Practice
Course Name	Graduate Chemistry
Starts 1	1 Spring and Autumn Semester
Lecturer	Faculty of Chemistry

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### Course Purpose

#### Prerequisite Subjects

not specified.

#### Course Topics

A student applies for a theme for research set up under the cooperation of a company and Nagoya University. Students should attend at the lecture at the university on the duty of confidentiality and the protection of intellectual property rights before starting the internship.

#### Textbook

not specified.

#### Additional Reading

not specified.

#### Grade Assessment

The credits will be given to the students who have had the working days more than or equal to 81 days in the internship company.

#### Notes

#### Contacting Faculty

The questions will be answered by the direct supervisors as needed at the internship.

## Laboratory Visit 2 U2 (2.0credits) (研究室ローテーション 2 U2)

Course Type	Comprehensive engineering courses
Division at course	Doctor's Course
Class Format	Practice
Course Name	Graduate Chemistry
Starts 1	1 Spring and Autumn Semester
Lecturer	Faculty of Chemistry

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### Course Purpose

The aim is to expand the ability as a researcher by conducting thesis research at different laboratories.

### Prerequisite Subjects

None in particular

### Course Topics

conducting thesis research at different laboratories

U2, U3; short term basic research, U4, U6, U8; long term advanced research

### Textbook

None in particular

### Additional Reading

None in particular

### Grade Assessment

Credits will be awarded to those students who score 'Pass'.

Thesis supervisor will make overall evaluation based on 1) credit hours, 2) research report and 3) evaluation by the host researcher.

### Notes

Contacting Faculty

## Laboratory Visit 2 U3 (3.0credits) (研究室ローテーション 2 U3)

Course Type	Comprehensive engineering courses
Division at course	Doctor's Course
Class Format	Practice
Course Name	Graduate Chemistry
Starts 1	1 Spring and Autumn Semester
Lecturer	Faculty of Chemistry

---

### Course Purpose

The aim is to expand the ability as a researcher by conducting thesis research at different laboratories.

### Prerequisite Subjects

None in particular

### Course Topics

conducting thesis research at different laboratories

U2, U3; short term basic research, U4, U6, U8; long term advanced research

### Textbook

None in particular

### Additional Reading

None in particular

### Grade Assessment

Credits will be awarded to those students who score 'Pass'.

Thesis supervisor will make overall evaluation based on 1) credit hours, 2) research report and 3) evaluation by the host researcher.

### Notes

Contacting Faculty

## Laboratory Visit 2 U4 (4.0credits) (研究室ローテーション 2 U4)

Course Type	Comprehensive engineering courses
Division at course	Doctor's Course
Class Format	Practice
Course Name	Graduate Chemistry
Starts 1	1 Spring and Autumn Semester
Lecturer	Faculty of Chemistry

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### Course Purpose

The aim is to expand the ability as a researcher by conducting thesis research at different laboratories.

### Prerequisite Subjects

None in particular

### Course Topics

conducting thesis research at different laboratories

U2, U3; short term basic research, U4, U6, U8; long term advanced research

### Textbook

None in particular

### Additional Reading

None in particular

### Grade Assessment

Credits will be awarded to those students who score 'Pass'.

Thesis supervisor will make overall evaluation based on 1) credit hours, 2) research report and 3) evaluation by the host researcher.

### Notes

Contacting Faculty

## Laboratory Visit 2 U6 (6.0credits) (研究室ローテーション 2 U6)

Course Type	Comprehensive engineering courses
Division at course	Doctor's Course
Class Format	Practice
Course Name	Graduate Chemistry
Starts 1	1 Spring and Autumn Semester
Lecturer	Faculty of Chemistry

---

### Course Purpose

The aim is to expand the ability as a researcher by conducting thesis research at different laboratories.

### Prerequisite Subjects

None in particular

### Course Topics

conducting thesis research at different laboratories

U2, U3; short term basic research, U4, U6, U8; long term advanced research

### Textbook

None in particular

### Additional Reading

None in particular

### Grade Assessment

Credits will be awarded to those students who score 'Pass'.

Thesis supervisor will make overall evaluation based on 1) credit hours, 2) research report and 3) evaluation by the host researcher.

### Notes

Contacting Faculty

## Laboratory Visit 2 U8 (8.0credits) (研究室ローテーション 2 U8)

Course Type	Comprehensive engineering courses
Division at course	Doctor's Course
Class Format	Practice
Course Name	Graduate Chemistry
Starts 1	1 Spring and Autumn Semester
Lecturer	Faculty of Chemistry

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### Course Purpose

The aim is to expand the ability as a researcher by conducting thesis research at different laboratories.

### Prerequisite Subjects

None in particular

### Course Topics

conducting thesis research at different laboratories

U2, U3; short term basic research, U4, U6, U8; long term advanced research

### Textbook

None in particular

### Additional Reading

None in particular

### Grade Assessment

Credits will be awarded to those students who score 'Pass'.

Thesis supervisor will make overall evaluation based on 1) credit hours, 2) research report and 3) evaluation by the host researcher.

### Notes

Contacting Faculty