2016（Term Ⅰ・Ⅲ・Ⅴ）
SCHOOL SPECIFIC COURSE SYLLABUS FOR G30 PROGRAM
(School of Agricultural Sciences)

Table of Contents

《Term V》

科目名　Couse Title	
Mathematics Tutorial Ia	
学科・専攻　Department/Program	**受講年次　Grade**
G30 Biology	1 year
授業形態　Class style	**必修・選択の別　Compulsory or Elective**
Exercise	* See "Remarks"
時間割コード　Registration code	**開講期・曜日・時限　Semester,Day & Period**
0910825	Fall semester Tue：4
単位数　Credit	**科目区分　Course type**
1	Basic Specialized Courses

担当教員　Instructor	RICHARD Serge charle
所属研究室　Laboratory	Graduate School of Mathematics
連絡先　Contact	richard@math.nagoya-u.ac.jp
居室　Room	Sci. Bldg A, 237

講義の目的とねらい　Course purpose

The aim of this course is to deepen the understanding of calculus and to cultivate the ability to apply mathematical knowledge. The course is mainly intended for students taking Calculus I.

履修要件　Prerequisite

履修取り下げについて　Course withdrawal

<可否>　Possible
<条件>
Submit a Course Withdrawal Request Form when the student has no intention of finishing the course during the semester.

成績評価　Grading

Your final grade will be determined by homework (50%) and quizzes (50%).

不可（F）と欠席の基準　Criteria for "Absent" &"Fail" grades

The grading scale will be: S: 90-100, A: 80-89, B: 70-79, C: 60-69, F: 0-59.

関連する科目　Related courses

Calculus I, registration code : 0064511.

教室　Class room

Check the Course Timetable.
Science Building A, rooms 407 & 408.

授業内容　Content
Exercises sheets will be provided each week before the tutorial, and will be available on the web site of the course. Homework will be due every week during the tutorial. For more information: http://www.math.nagoya-u.ac.jp/~richard/fall2016.html

教科書　Textbook
参考書　Recommended reading
連絡方法　Contact method
Email to : richard@math.nagoya-u.ac.jp
その他　Remarks
*See Course List and Graduation Requirements for your program for your enrollment year.

科目名　Couse Title	
Mathematics Tutorial Ib	
学科・専攻　Department/Program	**受講年次　Grade**
G30 Biology	1 year
授業形態　Class style	**必修・選択の別　Compulsory or Elective**
Exercise	* See "Remarks"
時間割コード　Registration code	**開講期・曜日・時限　Semester,Day & Period**
0910826	Fall semester Tue：4
単位数　Credit	**科目区分　Course type**
1	Basic Specialized Courses

担当教員　Instructor	DARPO Erik Olof
所属研究室　Laboratory	
連絡先　Contact	
居室　Room	

講義の目的とねらい　Course purpose

The aim of this course is to provide essential mathematical knowledge necessary to further study mathematics and other sciences at university level. The course is intended for students taking Linear algebra I.

履修要件　Prerequisite

High-school level mathematics

履修取り下げについて　Course withdrawal

<可否>　Possible
<条件>
A student may withdraw from the course at any time before the final examination. Requests for withdrawal should be made to the instructor in writing.

成績評価　Grading

The examination of this course coincides with the examination of the course Linear Algebra I.

不可（F）と欠席の基準　Criteria for "Absent" &"Fail" grades

A student who has either
1. not participated in any part of the examination of the course, or
2. withdrawn from the course,
will receive the grade "Absent".

関連する科目　Related courses

Linear Algebra I

教室　Class room

Check the Course Timetable.

授業内容　Content
1. Geometric setting : points and vectors in Rn, located vectors in Rn, scalar product in Rn, norm and scalar product in Rn, parametric representation of a line, planes and hyperplanes. 2. Matrices and linear equations: matrices, homogeneous linear equations, row operations and Gauss elimination, elementary matrices. 3. Vector spaces: abstract definition, linear combinations, convex sets, linear independence, dimension, the rank of a matrix. 4. Linear maps: general maps, linear maps, kernel and range of linear maps, rank and linear maps, matrix associated with a linear map, composition of linear maps, inverse of a linear map.

教科書　Textbook
参考書　Recommended reading
Linear Algebra with Applications, fourth edition, Otto Bretscher, Pearson, 2009
連絡方法　Contact method
その他　Remarks
*See Course List and Graduation Requirements for your program for your enrollment year.

学科・専攻 Department/Program	受講年次 Grade	授業形態 Class style	必修・選択の別 Compulsory or Elective
G30 Biology	1 year		* See "Remarks"
時間割コード Registration code	**開講期・曜日・時限 Semester,Day & Period**	**単位数 Credit**	**科目区分 Course type**
0910801	Fall semester Tue：4	2	Basic Specialized Courses
科目名 Couse Title	Mathematics Tutorial I		
担当教員 Instructor	**所属研究室 Laboratory**	**連絡先 Contact**	**居室 Room**
RICHARD Serge Charles			

講義の目的とねらい Course purpose				
履修要件 Prerequisite				
履修取り下げについて Course withdrawal	**（可否）**		**(条件)**	
成績評価 Grading				
不可（F）と欠席の規準 Criteria for "Absent" &"Fail" grades				
関連する科目 Related courses				
関連する科目 Related courses				
教室 Class room				

授業内容 Content	

教科書 Textbook	
参考書 Recommended reading	
連絡方法 Contact method	
その他 Remarks	*See Course List and Graduation Requirements for your program for your enrollment year.

科目名　Couse Title	
Fundamental Physics Tutorial Ia	
学科・専攻　Department/Program	**受講年次　Grade**
G30 Biology	1 year
授業形態　Class style	**必修・選択の別　Compulsory or Elective**
Exercise	* See "Remarks"
時間割コード　Registration code	**開講期・曜日・時限　Semester,Day & Period**
0910822	Fall semester Fri：3
単位数　Credit	**科目区分　Course type**
1	Basic Specialized Courses

担当教員　Instructor	FOONG　See　Kit
所属研究室　Laboratory	E-lab
連絡先　Contact	skfoong@eken.phys.nagoya-u.ac.jp
居室　Room	ES420
担当教員　Instructor	KOUYAMA Tsutomu
所属研究室　Laboratory	J-lab: Supramolecular physics
連絡先　Contact	kouyama@bio.phys.nagoya-u.ac.jp
居室　Room	science hall 722

講義の目的とねらい　Course purpose

This is the companion course to the lecture course Fundamentals of Physics I on introductory calculus-based mechanics. It offers practical exercises for mastering the concepts introduced in the lectures. Students taking the lecture course should also take this tutorial course.

履修要件　Prerequisite

No prerequisite is required; however, students without a good background in high school physics and basic calculus are expected to spend more time on this course, and are advised to take this into consideration when deciding their course load.

履修取り下げについて　Course withdrawal

<可否>　Possible
<条件>
Withdrawal is possible only before November 1.

成績評価　Grading

Weekly assignments and Quizzes, attendance, class participation.
(The details will be announced in class.)

不可（F）と欠席の基準　Criteria for "Absent" &"Fail" grades

Class attendance is required. Absentee must give a valid reason supported by documents. A student will receive an “ Absent ” grade if he is absent without valid reason from tutorial more than 2 times."

関連する科目　Related courses

Calculus I; Fundamentals of Physics II

教室　Class room

Check the Course Timetable.
ES034 and ES035

授業内容　Content

See syllabus for Fundamentals of Physics I.

教科書　Textbook

Fundamentals of Physics Extended 10th Edition International Student Version with WileyPLUS Set (John Wiley & Sons, 2010　ISBN:9780470576083)

参考書　Recommended reading

連絡方法　Contact method

By appointment. Please email instructors to make an appoinment.

その他　Remarks

*See Course List and Graduation Requirements for your program for your enrollment year.
• Concurrent registration for Fundamentals of Physics I is required.

• Students are expected to participate actively in class activities throughout the course.

科目名　Couse Title	
Fundamental Physics Tutorial Ib	
学科・専攻　Department/Program	**受講年次　Grade**
G30 Biology	1 year
授業形態　Class style	**必修・選択の別　Compulsory or Elective**
Exercise	* See "Remarks"
時間割コード　Registration code	**開講期・曜日・時限　Semester,Day & Period**
0910823	Fall semester Fri：3
単位数　Credit	**科目区分　Course type**
1	Basic Specialized Courses

担当教員　Instructor	GELLOZ　Bernard　Jacques
所属研究室　Laboratory	
連絡先　Contact	
居室　Room	
担当教員　Instructor	TAMA Florence Muriel
所属研究室　Laboratory	
連絡先　Contact	florence.tama@nagoya-u.jp
居室　Room	

講義の目的とねらい　Course purpose

This is a companion course to Fundamental Physics II, and offers practical exercises for mastering the concepts introduced in the lecture courses. Students taking the lecture courses should also take this tutorial class.

履修要件　Prerequisite

履修取り下げについて　Course withdrawal

<可否>　Possible
<条件>

成績評価　Grading

Weekly assignments and quizzes; attendance; class participation. (Weighting to be advised.)

不可（F）と欠席の基準　Criteria for "Absent" &"Fail" grades

• Class attendance is required. Absentees must give a valid reason (e.g. doctor ’ s certificate). A student who is absent from more than 3 sessions will receive zero for the semester attendance mark.
• The “ Absent ” grade is reserved for students who withdraw until just after the final quiz. After that day, a letter grade will be awarded based on marks earned from all assessment during the semester.

関連する科目　Related courses
Calculus I, Calculus II, Linear Algebra I, Linear Algebra II, Fundamentals of Physics I, III & IV
教室　Class room
Check the Course Timetable.

授業内容　Content
See syllabus for Fundamental Physics II.

教科書　Textbook
Fundamentals of Physics Extended 10th Edition International Student Version with WileyPLUS Set (John Wiley & Sons, 2010 ISBN: 9781118230749)
参考書　Recommended reading
連絡方法　Contact method
その他　Remarks
*See Course List and Graduation Requirements for your program for your enrollment year. - No pre-requisite is required; however, students without a good background in high school physics and basic calculus are expected to spend more time on this course, and are advised to take this into consideration when deciding their course load. - Concurrent registration for Fundamental Physics II is required. - Students are expected to participate actively in class activities throughout the course.

科目名　Couse Title	
Fundamental Physics Tutorial I	
学科・専攻　Department/Program	受講年次　Grade
G30 Biology	1 year
授業形態　Class style	必修・選択の別　Compulsory or Elective
Exercise	* See "Remarks"
時間割コード　Registration code	開講期・曜日・時限　Semester,Day & Period
0910802	Fall semester Fri：3
単位数　Credit	科目区分　Course type
2	Basic Specialized Courses

担当教員　Instructor	FOONG　See　Kit
所属研究室　Laboratory	
連絡先　Contact	
居室　Room	
担当教員　Instructor	GELLOZ　Bernard　Jacques
所属研究室　Laboratory	
連絡先　Contact	
居室　Room	
担当教員　Instructor	WOJDYLO　John　Andrew
所属研究室　Laboratory	
連絡先　Contact	
居室　Room	
担当教員　Instructor	KOUYAMA Tsutomu
所属研究室　Laboratory	
連絡先　Contact	
居室　Room	

講義の目的とねらい　Course purpose
This is a companion course to Fundamental Physics II, a course in basic, calculus-based physics, and offers practical exercises for mastering the concepts introduced in the lecture courses. Students taking the lecture courses should also take this tutorial class.
履修要件　Prerequisite

Prerequisites: None.

• No prerequisite is required; however, students without a good background in high school physics and basic calculus are expected to spend more time on this course, and are advised to take this into consideration when deciding their course load.

履修取り下げについて　Course withdrawal

<可否>　Possible
<条件>
Withdrawal is possible only before November 16.

成績評価　Grading

Weekly assignments; attendance; class participation. (Weighting to be advised.)

不可（F）と欠席の基準　Criteria for "Absent" &"Fail" grades

The “ Absent ” grade is reserved for students who withdraw by November 16. After that day, a letter grade will be awarded based on marks earned from all assessment during the semester. If insufficient marks have been scored, a grade of "F" will be given.

関連する科目　Related courses

Calculus I; Fundamentals of Physics I ; Fundamentals of Physics II

教室　Class room

Check the Course Timetable.

授業内容　Content

See syllabus for Fundamental Physics II.

教科書　Textbook

Fundamentals of Physics Extended 10th Edition International Student Version with WileyPLUS Set (John Wiley & Sons, 2010　ISBN:9780470576083)

参考書　Recommended reading

連絡方法　Contact method

See syllabus for Fundamental Physics II.

その他　Remarks

*See Course List and Graduation Requirements for your program for your enrollment year.
• No pre-requisite is required; however, students without a good background in high school physics and basic calculus are expected to spend more time on this course, and are advised to take this into consideration when deciding their course load.

• Concurrent registration for Fundamental Physics II is required.

• Students are expected to participate actively in class activities throughout the course.

科目名　Couse Title	
Biochemistry I	
学科・専攻　Department/Program	受講年次　Grade
G30 Biology	2 years
授業形態　Class style	必修・選択の別　Compulsory or Elective
Lecture	* See "Remarks"
時間割コード　Registration code	開講期・曜日・時限　Semester,Day & Period
0910805	Fall semester Mon：1
単位数　Credit	科目区分　Course type
2	Basic Specialized Courses

担当教員　Instructor	MIZUKAMI Yukiko
所属研究室　Laboratory	G30: Plant Size Control
連絡先　Contact	ymizukami@bio.nagoya-u.ac.jp
居室　Room	SA333

講義の目的とねらい　Course purpose

This course provides students with a comprehensive introduction to the chemical evolution of biomolecules and their contributions to life. Topics discussed include the origin of life; chemical and physical properties of water; chemical, structural, and functional properties of nucleotides, nucleic acids, amino acids, and proteins.

履修要件　Prerequisite

Prerequisite: You MUST take Fundamentals of Biology I & II (Terms I & II, respectively) before taking this course.

履修取り下げについて　Course withdrawal

<可否>　Possible
<条件>
With a written request sent to the instructor before/on October 24 via e-mail, you can cancel a course assignment without it appearing on your record.

成績評価　Grading

Grading materials: Homework (10%); Attendance and participation (20%); Exams (70%).
Grading scale: S=90-100%; A=80-89%; B=70-79%; C=60-69%; F=below 59%.

不可（F）と欠席の基準　Criteria for "Absent" &"Fail" grades

No “ Absent ” grade will be given in this course.
Students who fail to attend 3 or more lectures will immediately get an “ F (Fail) ” grade.

関連する科目　Related courses

Biochemistry II, III, and IV (Terms IV, V, and VI, respectively)

教室　Class room

Check the Course Timetable.
A407 (Science building A, room 407)

授業内容　Content

PART I: INTRODUCTION
1. Life, Cells and Thermodynamics (1): The origin of Life.
2. Life, Cells and Thermodynamics (2): Cellular architecture; Thermodynamics.
3. Water: Physical & chemical properties of water.

Part II: BIOMOLECULES
4. DNA Structure, Function, and Engineering (1): Nucleotides; Nucleic acid structure and function.
5. DNA Structure, Function, and Engineering (2): Nucleic acid sequencing; Manipulating DNA.
6. Amino Acids: Amino acid structure; Stereochemistry; Amino acid derivatives.
7. Proteins: Primary structure (1): Polypeptide diversity; Protein purification and analysis.
8. Proteins: Primary structure (2): Polypeptide sequencing; Protein evolution.
9. Proteins: 3D structure (1): Secondary and tertiary structures; Quaternary structure and symmetry.
10. Proteins: 3D structure (2): Protein stability; Protein folding.
11. Physical Activities of Proteins (1): Myoglobin and hemoglobin.
12. Physical Activities of Proteins (2): Actin and myosin; Antibodies.

教科書　Textbook

Principles of Biochemistry (International Students Version, 2012)
by Voet, D., Voet, J.G. and Pratt, C.W., Wiley and son, Inc. USA. ISBN: 78-11809244-6

参考書　Recommended reading

Will be introduced in class

連絡方法　Contact method

Via e-mail only

その他　Remarks

*See Course List and Graduation Requirements for your program for your enrollment year.
Office hours: Thursday, 2:00 pm – 4:00 pm, or by an appointment via e-mail

See "Course List and Graduation Requirements" for your program for your enrollment year.

科目名　Couse Title	
Physiology and Developmental Biology	
学科・専攻　Department/Program	**受講年次　Grade**
G30 Biology	2 years
授業形態　Class style	**必修・選択の別　Compulsory or Elective**
Lecture	* See "Remarks"
時間割コード　Registration code	**開講期・曜日・時限　Semester,Day & Period**
0913018	Fall semester Mon：3
単位数　Credit	**科目区分　Course type**
2	Specialized Courses

担当教員　Instructor	MIZUKAMI Yukiko
所属研究室　Laboratory	
連絡先　Contact	
居室　Room	

講義の目的とねらい　Course purpose

This course outlines the fundamentals of plant physiology, beginning with a brief introduction of general concepts in physiology to clarify the common or distinct aspects of physiological strategies used by animals and plants. Topics discussed in the plant physiology section include physiological principles of plant structure, growth, and development; transport and translocation of water in plants; responses of plant cells to light and other external signals; and strategies for carbon dioxide fixation.

履修要件　Prerequisite

Prerequisite: You MUST pass Fundamentals of Biology I & II (Terms I & II, respectively) courses before taking this course.

履修取り下げについて　Course withdrawal

<可否>　Possible
<条件>
With a written request sent to the instructor before/on October 24 via e-mail, you can cancel a course assignment without it appearing on your record.

成績評価　Grading

Grading materials: Homework & essay (20%); Attendance and participation (15%); Exams (65%).
Grading scale: S=90-100%; A=80-89%; B=70-79%; C=60-69%; F=below 59%.

不可（F）と欠席の基準　Criteria for "Absent" &"Fail" grades

No “ Absent ” grade will be given in this course. Students who fail to attend 3 or more lectures will immediately get an “ F (Fail) ” grade.

関連する科目　Related courses

Plant Physiology (Term V)

教室　Class room

Check the Course Timetable.
Science Building A, room 407 (A407)

授業内容　Content

PART I: General Concepts in Physiology

1. Introduction: What is physiology & developmental biology?
2. The organization of the body: The principal organ systems in animals and plants
3. Animal development: Gametogenesis, embryogenesis, and organogenesis of Drosophila

PART II: Plant Growth and Development

4. Principles of plant life: Unique patterns in plant development
5. Plant development (1): Embryonic and post embryonic development
6. Plant development (2): Reproductive development
7. Plant development (3): The control of flowering
8. Water in plant life: Transport and translocation of water
9. Light, photoreceptors, and plant growth (1): Red light reception
10. Light, photoreceptors, and plant growth (2): Blue light reception
11. Photosynthesis (1) The light reactions
12. Photosynthesis (2) The carbon reactions

教科書　Textbook

None

参考書　Recommended reading

1. Plant Physiology: International Edition (5th revised edition, 2010) by Taiz, L. and Zeiger, E., Sinauer Associates Inc., USA. ISBN: 0878935657
2. Principles of Development (4th edition, 2010) by Wolpert, L. and Tickle, C., Oxford University Press, USA. ISBN: 0199554285
3. Human Physiology: The Basis of Medicine (3rd edition, 2006) by Pocock, G. & Richards, C.D., Oxford University Press, USA. ISBN: 0198568789.
4. Principles of Developmental Biology (2003) by Wilt, F.H. & Hake, S., W W Norton & Co Inc (Np). ISBN: 0393974308

連絡方法　Contact method

via e-mail only

その他　Remarks

*See Course List and Graduation Requirements for your program for your enrollment year.
Office hours: Thursday, 2:00 pm – 4:00 pm, or by an appointment via e-mail.

See "Course List and Graduation Requirements" for your program for your enrollment year.

科目名　Couse Title	
Physiology I	
学科・専攻　Department/Program	**受講年次　Grade**
G30 Biology	2 years
授業形態　Class style	**必修・選択の別　Compulsory or Elective**
Lecture	* See "Remarks"
時間割コード　Registration code	**開講期・曜日・時限　Semester,Day & Period**
0913002	Fall semester Mon：3
単位数　Credit	**科目区分　Course type**
2	Specialized Courses

担当教員　Instructor	MIZUKAMI Yukiko
所属研究室　Laboratory	G30: Plant Size Control
連絡先　Contact	ymizukami@bio.nagoya-u.ac.jp
居室　Room	SA333

講義の目的とねらい　Course purpose

This course outlines the fundamentals of plant physiology, beginning with a brief introduction of general concepts in physiology to clarify the common or distinct aspects of physiological strategies used by animals and plants. Topics discussed in the plant physiology section include physiological principles of plant structure, growth, and development; transport and translocation of water in plants; responses of plant cells to light and other external signals; and strategies for CO2 fixation.

履修要件　Prerequisite

Prerequisite: You MUST pass Fundamentals of Biology I & II (Terms I & II, respectively) courses before taking this course.

履修取り下げについて　Course withdrawal

<可否>　Possible
<条件>
With a written request sent to the instructor before/on October 24 via e-mail, you can cancel a course assignment without it appearing on your record.

成績評価　Grading

Grading materials: Homework & essay (20%); Attendance and participation (15%); Exams (65%).
Grading scale: S=90-100%; A=80-89%; B=70-79%; C=60-69%; F=below 59%.

不可（F）と欠席の基準　Criteria for "Absent" &"Fail" grades

No “ Absent ” grade will be given in this course. Students who fail to attend 3 or more lectures will immediately get an “ F (Fail) ” grade.

関連する科目　Related courses

Plant Physiology (Term V)

教室　Class room

Check the Course Timetable.
Science Building A, room 407 (A407)

授業内容　Content

PART I: General Concepts in Physiology

1. Introduction: What is physiology?
2. The organization of the body: The principal organ systems in animals and plants
3. Animal development: Gametogenesis, embryogenesis, and organogenesis of Drosophila

PART II: Plant Growth and Development

4. Principles of plant life: Unique patterns in plant development
5. Plant development (1): Embryonic and post-embryonic development
6. Plant development (2): reproductive development
7. Plant development (3): The control of flowering
8. Water in plant life: Transport and translocation of water
9. Light, photoreceptors, and plant growth (1): Red light reception
10. Light, photoreceptors, and plant growth (2): Blue light reception
11. Photosynthesis (1) The light reactions
12. Photosynthesis (2) The carbon reactions

教科書　Textbook

None

参考書　Recommended reading

1. Plant Physiology: International Edition (5th revised edition, 2010) by Taiz, L. and Zeiger, E., Sinauer Associates Inc., USA. ISBN: 0878935657
2. Principles of Development (4th edition, 2010) by Wolpert, L. and Tickle, C., Oxford University Press, USA. ISBN: 0199554285
3. Human Physiology: The Basis of Medicine (3rd edition, 2006) by Pocock, G. & Richards, C.D., Oxford University Press, USA. ISBN: 0198568789.
4. Principles of Developmental Biology (2003) by Wilt, F.H. & Hake, S., W W Norton & Co Inc (Np). ISBN: 0393974308

連絡方法　Contact method

via e-mail only

その他　Remarks

*See Course List and Graduation Requirements for your program for your enrollment year.
Office hours: Thursday, 2:00 pm – 4:00 pm, or by an appointment via e-mail

See "Course List and Graduation Requirements" for your program for your enrollment year.

科目名　Couse Title	
Analytical Chemistry	
学科・専攻　Department/Program	受講年次　Grade
G30 Biology	2 years
授業形態　Class style	必修・選択の別　Compulsory or Elective
Lecture	* See "Remarks"
時間割コード　Registration code	開講期・曜日・時限　Semester,Day & Period
0910806	Fall semester Tue：1
単位数　Credit	科目区分　Course type
2	Basic Specialized Courses

担当教員　Instructor	FISCHER　Berthold
所属研究室　Laboratory	
連絡先　Contact	Phone: 789-5041　E-mail: fischer@chem.nagoya-u.ac.jp
居室　Room	SA Building-318-2 (Science & Agriculture)

講義の目的とねらい　Course purpose

The purpose of this course is to teach students the fundamentals of analytical chemistry, in preparation of further studies.
The course focuses mainly on classical but still widely used wet chemical methods,
combined with an overview of the instrumental techniques used in contemporary chemical analysis.

履修要件　Prerequisite

Fundamentals of Chemistry I and II

履修取り下げについて　Course withdrawal

<可否>　Possible
<条件>
Nagoya University approved system; students can withdraw from this course if they submit the request form to the instructor by the officially published date.

成績評価　Grading

Participation in discussion, Quizzes, Group presentations, homework: 50 % Final Exam 50 %
TOTAL: 100 %
Grade "S": 100-90% (90 or more points), "A": 89-80% (89 - 80 pts), "B": 79-70% (79-70 pts),
"C": 69-60% (69-60 pts), "F": 59-0% (fewer than 59 pts).

不可（F）と欠席の基準　Criteria for "Absent" &"Fail" grades

Nagoya University approved system; students can withdraw from this course if they submit the request form to the instructor by the officially published date.

関連する科目　Related courses

Laboratory in Chemistry

教室　Class room

Check the Course Timetable.
A-407

授業内容　Content

1. General Concept of Chemical Equilibrium
2. Acid-Base Equilibria
3. Acid-Base Titrations
4. Complexometric Reactions and Titrations
5. Gravimetric Analysis and Precipitation Equilibria
6. Precipitation Reactions and Titrations
7. Redox Reactions and Equilibria
8. Spectrochemical Methods
9. Sample Preparation: Solvent and Solid-Phase Extraction
10. Chromatography: Principles and Theory
11. Gas Chromatography
12. Liquid Chromatography
13. Clinical Chemistry
14. Environmental Sampling and Analysis

教科書　Textbook

No textbook

参考書　Recommended reading

None

連絡方法　Contact method

There are two ways to communicate with the instructor: face-to-face
in the lecture or the office hour and by e-mail.

その他　Remarks

*See Course List and Graduation Requirements for your program for your enrollment year.

科目名　Couse Title	
Mathematical Physics Tutorial I	
学科・専攻　Department/Program	**受講年次　Grade**
G30 Biology	2 years
授業形態　Class style	**必修・選択の別　Compulsory or Elective**
Exercise	* See "Remarks"
時間割コード　Registration code	**開講期・曜日・時限　Semester,Day & Period**
0910824	Fall semester Tue：4
単位数　Credit	**科目区分　Course type**
1	Basic Specialized Courses

担当教員　Instructor	MATSUZAKI Shinya
所属研究室　Laboratory	H lab
連絡先　Contact	synya@hken.phys.nagoya-u.ac.jp
居室　Room	ES747

講義の目的とねらい　Course purpose

Students taking Mathematical Physics I should also take this tutorial class. This course introduces first order and second order ordinary differential equations and their solution methods. Students master exact and approximate analytical techniques for initial value problems that arise in physics, engineering and chemistry. Questions of existence, uniqueness and convergence are also discussed. Fourier series follow naturally from the 2nd order theory and these are investigated, too.

履修要件　Prerequisite

Calculus I, Calculus II, Linear Algebra I, Linear Algebra II;or Consent of Instructor

履修取り下げについて　Course withdrawal

<可否>　Possible
<条件>

成績評価　Grading

Attendance: 60%; Class performance: 40%

不可（F）と欠席の基準　Criteria for "Absent" &"Fail" grades

The “ Absent ” grade is reserved for students who withdraw by November 17. After that day, a letter grade will be awarded based on marks earned from all assessments during the semester.

関連する科目　Related courses

Mathematical Physics I.

教室　Class room

Check the Course Timetable.
ES033.

授業内容　Content

• First order ordinary differential equation (ODE) initial value problems.
Integration factor; separable equations; systems of ODEs (Hamiltonian systems); phase plane, flow. Uniqueness and existence theorems.
Some differences between linear and nonlinear ODEs.

• Second order linear ODE initial value problems.
Homogeneous solution.
Proving linear independence (Wronskian).
Method of Undetermined Coefficients; Variation of Parameters.
Series solutions: ordinary point, regular singular point; convergence tests;
Method of Frobenius.
Examples from physics,engineering and chemistry.

• Fourier series. Dirichlet conditions.
Role of symmetry. Gibbs phenomenon.
Effect of jump discontinuity on speed of convergence.
Integration and differentiation of Fourier series.

教科書　Textbook

None.

参考書　Recommended reading

1.Boyce W., DiPrima R, Elementary Differential Equations, 9th or 10th Ed., Wiley.

2.Strang, G., Introduction to Linear Algebra, 4th Edition, Chapter 6.

3.Riley K.F., Hobson M.P., and Bence S. J., 2006, Mathematical Methods for Physics and Engineering, 3rd ed., Cambridge University Press.

4.Boas M.L., 1983, Mathematical Methods in the Physical Sciences, John Wiley & Sons.
Arfken G.B. & Weber H.J., 2005, Mathematical Methods for Physicists, 6th ed., Elsevier Academic Press.

(Copies are available in the library.)

連絡方法　Contact method

By emails.

その他　Remarks

*See Course List and Graduation Requirements for your program for your enrollment year.
Concurrent registration in Mathematical Physics I is advised.

科目名　Couse Title	
Mathematical Physics I	
学科・専攻　Department/Program	**受講年次　Grade**
G30 Biology	2 years
授業形態　Class style	**必修・選択の別　Compulsory or Elective**
Lecture	* See "Remarks"
時間割コード　Registration code	**開講期・曜日・時限　Semester,Day & Period**
0910810	Fall semester Tue：5
単位数　Credit	**科目区分　Course type**
2	Basic Specialized Courses

担当教員　Instructor	WOJDYLO　John　Andrew
所属研究室　Laboratory	
連絡先　Contact	
居室　Room	

講義の目的とねらい　Course purpose

This is a companion course to Mathematical Physics II. This course introduces first order and second order ordinary differential equations and their solution methods. Students master analytical techniques for problems that arise in physics, engineering and chemistry. Questions of uniqueness of solutions and convergence are also discussed. Students are also introduced to Fourier series, the Fourier transform, Laplace transform, and the Dirac delta function.

Students will find this mathematical methods course helpful in other units such as Quantum Mechanics, Analytical Mechanics, Electricity and Magnetism, as well as in Automotive Engineering and other engineering courses.

　This course has dual aims: 1) to convey mathematical principles; 2) to improve students ’ technical ability – i.e., ability to express intuition in mathematical terms and ability to solve problems.

履修要件　Prerequisite

Calculus I; Calculus II; Linear Algebra I; Linear Algebra II, or Consent of Instructor.

履修取り下げについて　Course withdrawal

<可否>　Possible
<条件>
Withdrawal is possible only before November 16.

成績評価　Grading

Attendance: 5%; Weekly Quizzes and Assignments: 25%; Mid-term exam: 35%; Final Exam: 35%.

不可（F）と欠席の基準　Criteria for "Absent" &"Fail" grades

The “ Absent ” grade is reserved for students who withdraw by November 16. After that day, a letter grade will be awarded based on marks earned from all assessment during the semester. If insufficient marks have been scored, a grade of "F" will be given.

関連する科目　Related courses

Mathematical Physics Tutorial I, Mathematical Physics II.

It is recommended that students also take the Complex Analysis course in the School of Mathematics.

教室　Class room

Check the Course Timetable.

授業内容　Content

• First order ordinary differential equation (ODE) initial value problems. Integration factor; separable equations; systems of ODEs (Hamiltonian systems); phase plane, flow. Uniqueness and existence theorems. Some differences between linear and nonlinear ODEs.

• Second order linear ODE initial value problems. Homogeneous solution. Proving linear independence (Wronskian). Method of Undetermined Coefficients; Variation of Parameters. Sequences and series. Absolute and uniform convergence: Weierstrass M-Test. Series solutions: ordinary point, regular singular point; convergence tests; Method of Frobenius. Examples from physics, engineering and chemistry.

• Fourier series. Dirichlet conditions. Role of symmetry. Gibbs phenomenon. Effect of jump discontinuity on speed of convergence. Integration and differentiation of Fourier series.

• Fourier transform, convolution, Dirac delta function.

• Laplace transform. Solution of linear 2nd, 3rd and 4th order linear ODEs with discontinuous forcing functions. Impulse. Convolution. Solution of linear PDE initial-boundary value problems with the Laplace transform.

教科書　Textbook

Boyce W., DiPrima R, Elementary Differential Equations, 7th –10th Ed., Wiley.

参考書　Recommended reading

1. Boas M.L., 2006, Mathematical Methods in the Physical Sciences, 3rd ed., John Wiley & Sons. Highly recommended, informal treatment of many topics relevant to undergraduate mathematics and physics.

2. Widder, David V., Advanced Calculus, Dover (2nd edition), 1989. Highly recommended, semi-formal treatment of many topics relevant to undergraduate mathematical physics. The book price is very low, great value for money.

3. Strang, G., Introduction to Linear Algebra, 4th Edition, Chapter 6.

4. Arfken G.B. & Weber H.J., 2005, Mathematical Methods for Physicists, 6th ed., Elsevier Academic Press. (Copies are available in the library.)

連絡方法　Contact method

In principle any time, by appointment.

Email: john.wojdylo@s.phys.nagoya-u.ac.jp

その他　Remarks
*See Course List and Graduation Requirements for your program for your enrollment year. • Students taking Mathematical Physics I should also take Mathematical Physics Tutorial I.   • Concurrent registration in Mathematical Physics II is recommended as that unit is a prerequisite for Electricity and Magnetism I.   • The books by Boas and Widder are useful for Mathematical Physics II and Electricity and Magnetism. Widder is also useful for Statistical Physics (Thermodynamics).

科目名　Couse Title	
Organic Chemistry I	
学科・専攻　Department/Program	**受講年次　Grade**
G30 Biology	2 years
授業形態　Class style	**必修・選択の別　Compulsory or Elective**
Lecture	* See "Remarks"
時間割コード　Registration code	**開講期・曜日・時限　Semester,Day & Period**
0910807	Fall semester Wed：1
単位数　Credit	**科目区分　Course type**
2	Basic Specialized Courses

担当教員　Instructor	SHIN　Jiyoung
所属研究室　Laboratory	
連絡先　Contact	jyshin@apchem.nagoya-u.ac.jp
居室　Room	

講義の目的とねらい　Course purpose

Main purpose of this course is to acquire a logical framework for understanding fundamental organic chemistry. This framework emphasizes how the structures of organic molecules are related to the molecular functions in chemical reactions. On the basis of the knowledge, we consecutively learn how to solve practical problems in organic chemistry.

履修要件　Prerequisite

Fundamentals of Chemistry I and II

履修取り下げについて　Course withdrawal

<可否>　Possible
<条件>
Student can withdraw the course with a submission of the requirement during a certain period prepared for course-withdrawal by university.

成績評価　Grading

Examination (two midterms and one final: 70%); Attendance (10%: each absence deducts 3 point); Assessment of Homework (20%): S(x≧90), A(90>x≧80), B(80>x≧70), C(70>x≧60),and F(60>x).

不可（F）と欠席の基準　Criteria for "Absent" &"Fail" grades

1. A maximum of three absences can be authorized.
2. Submissions of student sickness/absence reporting are required.

関連する科目　Related courses

教室　Class room

Check the Course Timetable.
141, Bldg.1,Engr.

授業内容　Content

1. Structure and Bonding in Organic Molecules: Hybridization
2. Structures of Organic Molecules and Their Stereochemistry
- Alkanes and Cycloalkanes
- Alkenes and Alkynes
- Delocalized π-System
3. Structures and Reactivity
- Polar and Nonpolar Molecules
- Formal Charge and Oxidation States
- Acids and Bases versus Electrophiles and Nucleophiles
- Chemical Reactions: Additions, Substitutions, and Eliminations
- Chemical Kinetics: Transition State, Intermediate, Endothermic and Exothermic Processes, and Activation Energy

4. Aliphatic Nucleophilic Substitutions: SN1 and SN2
- Chemical Kinetics: Stabilities of Reaction Intermediates (Carbocations: Hyperconjugation and Resonances)
- Stereochemistry upon the Stable Reaction Intermediate
- Unimolecular Nucleophilic Substitutions (SN1): Favor Substrates, Nucleophiles, Leaving Groups, and Solvents
- Bimolecular Nucleophilic Substitutions (SN2); Favor Substrates, Nucleophiles, Leaving Groups, and Solvents
- Comparison of SN1 and SN2
- Competing Reactions of SN1: Rearrangement and Unimolecular Elimination (E1)
- Competing Reaction of SN2: Bimolecular Elimination (E2)
- Unimolecular Elimination of Conjugate Bases (E1CB)

教科書　Textbook

Organic Chemistry: Structure and Function (Sixth Edition), Peter Vollhardt and Neil Schore, (International Edition: W. H. Freeman and Company), New York, 2009, Chapters 1-7.

参考書　Recommended reading

連絡方法　Contact method

Students can communicate with the course instructor face-to-face either in the class or in the appointment. Communication through an e-mail (instructor's e-mail:jyshin@apchem.nagoya-u.ac.jp) is also available.

その他　Remarks

*See Course List and Graduation Requirements for your program for your enrollment year.

科目名　Couse Title	
Analytical Mechanics I	
学科・専攻　Department/Program	受講年次　Grade
G30 Biology	2 years
授業形態　Class style	必修・選択の別　Compulsory or Elective
Lecture	* See "Remarks"
時間割コード　Registration code	開講期・曜日・時限　Semester,Day & Period
0910808	Fall semester Wed：2
単位数　Credit	科目区分　Course type
2	Basic Specialized Courses

担当教員　Instructor	FOONG　See　Kit
所属研究室　Laboratory	E-Lab
連絡先　Contact	052-789-2861
居室　Room	ES420

講義の目的とねらい　Course purpose

This is the first of two courses in analytical mechanics. Its purposes are to gain a deeper understanding, aided by basic vector calculus, of Newtonian mechanics treated in Year I, and to introduce the Lagrangian and Hamiltonian formulations of mechanics. These formulations are then used in the solution of the two-body central force problems.

履修要件　Prerequisite

Calculus I&II, Fundamentals of Physics I &II, and concurrent registration of Mathematical Physics I & II

履修取り下げについて　Course withdrawal

<可否>　Possible
<条件>
You may withdraw from the course following the standard procedure of the School of Science. The deadline for withdrawal is end of November.

成績評価　Grading

Will be based on Class Attendance & Participation, Assignments, Quizzes, mid-term and Final Exam (The details will be announced in class)

不可（F）と欠席の基準　Criteria for "Absent" &"Fail" grades

Class attendance is required. Absentee must give a valid reason, supported with document. A student will receive an “Absent” grade if he is absent without valid reason from lecture more than 3 times or the mid-term exam or the final exam.

関連する科目　Related courses

Analytical Mechanics II, Mathematical Physics I & II, Quantum Mechanics

教室　Class room
Check the Course Timetable. ES034

授業内容　Content
1. Newton ’ s Laws of Motion 2. Momentum and Angular Momentum 3. Energy and Forces 4. Calculus of Variations 5. Lagrange ’ s Equations 6. Hamiltonian Mechanics 7. Two Body Central-Force Problems

教科書　Textbook
John R. Taylor, Classical Mechanics (University Science Book, 2005)
参考書　Recommended reading
1. R. D. Gregory: Classical Mechanics (Cambridge, 2008) 2. J.B. Marion: Classical Dynamics of Particles and Systems (2nd Ed, Academic Press, 1970) 3. H. Goldstein, Poole & Safko: Classical Mechanics (Addison Wesley, 2002)
連絡方法　Contact method
Office hours, Email or phone FOONG See Kit Office: ES420 Phone: 052-789-2861 Email: skfoong@eken.phys.nagoya-u.ac.jp
その他　Remarks
*See Course List and Graduation Requirements for your program for your enrollment year. You are required to register for Physics Tutorial Ia (the tutorial for AM I) concurrently, unless you have passed the course.

G30 Program (School of Agricultural Sciences), (Undergraduate)

Agricultural Science

Registration code	0913001	**Credits**	2.0
Course Category	Specialized Courses	**Class room**	Room 6
Term (Semester)/Day/Period	Ⅲ(2nd year 1st semester)/Wed/5(16:30-18:00)		
Instructor	INOUE Naoko (Lectures are also given by other professors.)		
Contact	Office: Graduate School of Bioagricultural Sciences, Rm A242 Phone: 052-789-4074 E-mail: ninoue@agr.nagoya-u.ac.jp		

Course Purpose

We are beset by an array of global concerns such as the depletion of food and energy resources, poverty and health problems, and the destruction of the natural- and living-environments. This course, by taking as its base recent developments in the field of life sciences, aims to propose possible solutions to the above, through the analysis of biological production, symbiosis, and frontier technology in the field of bioscience.

Course Contents

1. Introduction	(INOUE Naoko)
2. Ecology of irrigated rice fields	(MURASE Jun)
3. International cooperation	(ITO Kasumi)
4. Basic reproductive endocrinology	(TSUKAMURA Hiroko)
5. Genetically modified crops	(TANIGUCHI Mitsutaka, Joyce Abad CARTAGENA)
6. Enzyme engineering	(IWASAKI Yugo)
7. Basic Crop Science	(YAMAUCHI Akira)
8.Interaction between plants and climate	(KOTANI Ayumi)
9.Nutrition and food sciences	(KITAURA Yasuyuki)
10. Group discussion	(INOUE Naoko)
11. Remarks	(INOUE Naoko)

Grading

Evaluation will be based on in-class participation and assignments.

Course Withdrawal TBA	**Criteria for "Absent" & "Fail" Grades** TBA
Prerequisite	**Related Courses**

Text Book	
Reference Book	TBA
Remarks	Japanese undergraduates and short-visit international students may also take the lecture.

科目名　Couse Title	
Physical Chemistry I	
学科・専攻　Department/Program	**受講年次　Grade**
G30 Biology	2 years
授業形態　Class style	**必修・選択の別　Compulsory or Elective**
Lecture	* See "Remarks"
時間割コード　Registration code	**開講期・曜日・時限　Semester,Day & Period**
0910809	Fall semester Thu：1
単位数　Credit	**科目区分　Course type**
2	Basic Specialized Courses

担当教員　Instructor	BUTKO　Peter
所属研究室　Laboratory	
連絡先　Contact	Phone: 789-2480 E-mail: pbutko@chem.nagoya-u.ac.jp
居室　Room	A Building-318-1 (Science & Agriculture)

講義の目的とねらい　Course purpose

The purpose of this course is to learn what physical chemistry is all about and to grasp important principles and facts about physical chemistry. The course begins with perfect gas law, proceeds to thermodynamics, and finishes with applications of thermodynamics to simple mixtures.

履修要件　Prerequisite

Fundamentals of Chemistry I and II

履修取り下げについて　Course withdrawal

<可否>　Possible
<条件>
Yes. The last day to withdraw without academic penalty is the 6th lecture period.

成績評価　Grading

Two exams: 100 points each, final exam (comprehensive): 200, homework: 50. TOTAL: 450.
Grade "S": 100-90% (405 or more points), "A": 89-80% (404 - 360 pts), "B": 79-70% (359 - 315 pts), "C": 69-60% (314 - 270 pts), "F": 59-0% (fewer than 270 pts).

不可（F）と欠席の基準　Criteria for "Absent" &"Fail" grades

The “ Absent ” grade is reserved for students that withdraw by the 6th lecture period. After that day, a letter grade will be awarded based on grades earned from all assignments during the semester.

関連する科目　Related courses

教室　Class room

Check the Course Timetable.
A-407

授業内容　Content
1 The Properties of Gases 1 (Ch. 1) 2 The Properties of Gases 2 (Ch. 1) 3 The First Law 1 (Ch. 2) 4 The First Law 2 (Ch. 2) 5 Pre-exam Review & EXAM 1 (Chs. 1 & 2) 6 The Second and Third Laws 1 (Ch. 3) 7 The Second and Third Laws 2 (Ch. 3) 8 Physical Transformations of Pure Substances (Ch. 4) 9 Simple Mixtures 1 (Ch. 5) 10 Simple Mixtures 2 (Ch. 5) 11 Pre-exam Review & EXAM 2 (Chs. 3 – 5) 12 Chemical Equilibrium 1 (Ch. 6) 13 Chemical Equilibrium 2 (Ch. 6) 14 Pre-final Review 15 FINAL EXAM (Ch. 1 – 6)

教科書　Textbook
P. Atkins and J. de Paula: Atkins’ Physical Chemistry, 10th Ed., Oxford University Press, 2014
参考書　Recommended reading
連絡方法　Contact method
その他　Remarks
*See Course List and Graduation Requirements for your program for your enrollment year.

科目名　Couse Title	
Genetics I	
学科・専攻　Department/Program	受講年次　Grade
G30 Biology	2 years
授業形態　Class style	必修・選択の別　Compulsory or Elective
Lecture	* See "Remarks"
時間割コード　Registration code	開講期・曜日・時限　Semester,Day & Period
0913003	Fall semester Thu：2
単位数　Credit	科目区分　Course type
2	Specialized Courses

担当教員　Instructor	VASSILEVA　Maria　Nikolaeva
所属研究室　Laboratory	
連絡先　Contact	mnvassileva@bio.nagoya-u.ac.jp
居室　Room	E202

講義の目的とねらい　Course purpose

This course will refresh and deepen basic knowledge of genetics, and is the beginning of a series of courses on Genetics that will stretch over two-year period.
Students will learn fundamental processes of how genetic information can be inherited rigidly and flexibly from generation to generation.
Students are expected to become adept at using appropriate scientific terminology, explain the basic genetics concepts and be able to analytically manipulate this information.

履修要件　Prerequisite

Prerequisite - successfully completed Fundamentals of Biology I

履修取り下げについて　Course withdrawal

<可否>　Possible
<条件>
Submit Course Withdrawal Request form by the sixth lecture.

成績評価　Grading

Evaluation is based on in-class participation, assignments and examinations, using Nagoya University grading system S/A/B/C/F

不可（F）と欠席の基準　Criteria for "Absent" &"Fail" grades

Absent – based on submission of Course Withdrawal Request Form.
Fail – based on a total of less than 60 points accumulated through examinations and assignments.

関連する科目　Related courses

Genetics II, Genetics III

教室　Class room
Check the Course Timetable. A 407

授業内容　Content
Overall theme of the course - Maintenance of the genome 1. Mendelian genetics 2. DNA and RNA structure 3. Chromosomes, chromatin, and the nucleosome 4. Replication of DNA 5. Mutability and repair of DNA 6. Genetic recombination

教科書　Textbook
Molecular Biology of the Gene, Watson, James D. et al., Pearson Education.
参考書　Recommended reading
Essentials of Genetics, William S. Klug et al., Benjamin Cummings.
連絡方法　Contact method
by e-mail
その他　Remarks
*See Course List and Graduation Requirements for your program for your enrollment year.

科目名　Couse Title	
Statistical Physics I	
学科・専攻　Department/Program	受講年次　Grade
G30 Biology	2 years
授業形態　Class style	必修・選択の別　Compulsory or Elective
Lecture	* See "Remarks"
時間割コード　Registration code	開講期・曜日・時限　Semester,Day & Period
0910812	Fall semester Fri：2
単位数　Credit	科目区分　Course type
2	Basic Specialized Courses

担当教員　Instructor	TAKIMOTO Fujio
所属研究室　Laboratory	
連絡先　Contact	
居室　Room	

講義の目的とねらい　Course purpose

The purpose of Statistical Physics I is to understand the basic laws that govern macroscopic bodies consisting of an enormous number of atoms and molecules. This first part of the course covers universal phenomenological laws, called thermodynamic laws, and their applications.
The main focus of this course is to understand the basic principles of classical thermodynamics which are the basis for macroscopic understanding of all the physical phenomena. The applications in automotive engineering are also introduced.

履修要件　Prerequisite

Calculus

履修取り下げについて　Course withdrawal

<可否>　Possible
<条件>
Ask the instructor.

成績評価　Grading

●Grade Assessment
Grades will be based on class participation, assignments and a final examination.
30% for attendance
30% for assignments
40% for final examination

不可（F）と欠席の基準　Criteria for "Absent" &"Fail" grades

Ask the instructor.

関連する科目　Related courses

教室　　Class room
Check the Course Timetable.

授業内容　　Content
●Course Topics 1.Thermal Equilibrium and Temperature 2.State Equations, Partial Differentials, Units and Dimensions 3.The First Law of Thermodynamics (energy, isothermal and adiabatic processes) 4.The Second Law of Thermodynamics 5.Entropy 6.Thermodynamic Functions 7.Phase Equilibrium and Chemical Equilibrium 8.Kinetic Theory and Statistical Mechanics

教科書　　Textbook
Printed handouts will be provided.
参考書　　Recommended reading
●Additional Reading Modern Engineering Thermodynamics; Robert T. Balmer; Academic Press (2010)
連絡方法　　Contact method
●Contacting Faculty Students can ask questions at any time during classes. Questoins during off-class hours can be asked at the lecturer's room (Engineering Building No.3 North Wing, Room 223 (3125)) or via e-mail: takimotof@nuem.nagoya-u.ac.jp
その他　　Remarks
*See Course List and Graduation Requirements for your program for your enrollment year.

科目名　Couse Title	
Cell Biology I	
学科・専攻　Department/Program	受講年次　Grade
G30 Biology	2 years
授業形態　Class style	必修・選択の別　Compulsory or Elective
Lecture	* See "Remarks"
時間割コード　Registration code	開講期・曜日・時限　Semester,Day & Period
0910811	Fall semester Fri：3
単位数　Credit	科目区分　Course type
2	Basic Specialized Courses

担当教員　Instructor	VASSILEVA　Maria　Nikolaeva
所属研究室　Laboratory	
連絡先　Contact	mnvassileva@bio.nagoya-u.ac.jp
居室　Room	E202

講義の目的とねらい　Course purpose

This course is expected to refresh and deepen students’ knowledge in basic cell organisation, and is the beginning of a series of courses on Cell Biology that will stretch over two-year period.
This first part, Cell Biology I, focuses on cell membrane as well as basic genetic mechanisms.

履修要件　Prerequisite

Prerequisite - successfully completed Fundamentals of Biology I

履修取り下げについて　Course withdrawal

<可否>　Possible
<条件>
Submit Course Withdrawal Request form by the sixth lecture.

成績評価　Grading

Evaluation is based on in-class participation, assignments and examinations.

不可（F）と欠席の基準　Criteria for "Absent" &"Fail" grades

Absent – based on submission of Course Withdrawal Request Form.
Fail - a total of less than 60 points accumulated through examinations and assignments.

関連する科目　Related courses

Cell Biology II, Cell Biology III

教室　Class room

Check the Course Timetable.
A 408

授業内容　Content
1. Introduction to cells 1.1 Cell architecture 1.2 Chemical components of cells 1.3 Protein structure and function 2. Cell membrane: Structure and Function 2.1 Membrane structure 2.2 Membrane transport 3. DNA and chromosome: Basic genetic mechanisms 3.1 DNA replication, repair and recombination 3.2 DNA translation 3.3 Control of gene expression

教科書　Textbook
Essential Cell Biology (third edition), B. Alberts et al., Garland Science.
参考書　Recommended reading
Becker`s world of the cell (8 ed.), Hardin, Bertoni, Kleinsmith, Pearson Molecular Biology of the Cell, B. Alberts et al., Taylor & Francis.
連絡方法　Contact method
By e-mail
その他　Remarks
*See Course List and Graduation Requirements for your program for your enrollment year.

科目名　Couse Title	
Plant Physiology	
学科・専攻　Department/Program	**受講年次　Grade**
G30 Biology	3 years
授業形態　Class style	**必修・選択の別　Compulsory or Elective**
Lecture	* See "Remarks"
時間割コード　Registration code	**開講期・曜日・時限　Semester,Day & Period**
0913007	Fall semester Tue：2
単位数　Credit	**科目区分　Course type**
2	Specialized Courses

担当教員　Instructor	MIZUKAMI Yukiko
所属研究室　Laboratory	G30: Plant Size Control
連絡先　Contact	ymizukami@bio.nagoya-u.ac.jp
居室　Room	SA333

講義の目的とねらい　Course purpose

This course provides students with a comprehensive understanding of concepts, principles, and strategies concerning the basic mechanisms underlying plant growth, development, and survival. Topics covered include mineral nutrition, solute transport, photosynthesis, respiration, metabolism, environmental and developmental signals, and plant hormone action.

履修要件　Prerequisite

No Prerequisite. However, strongly recommended to complete Physiology I (or Physiology and Developmental Biology) course before taking this course.

履修取り下げについて　Course withdrawal

<可否>　Possible
<条件>
With a written request sent to the instructor before/on October 18 via e-mail, you can cancel a course assignment without it appearing on your record.

成績評価　Grading

Grading materials: Presentations and reports (40%); Attendance and participation (20%); Exams (40%).
Grading scale: S=90-100%; A=80-89%; B=70-79%; C=60-69%; F=below 59%.

不可（F）と欠席の基準　Criteria for "Absent" &"Fail" grades

No “ Absent ” grade will be given in this course.
Students who fail to attend 3 or more lectures will immediately get an “ F (Fail) ” grade.

関連する科目　Related courses

Physiology I (or Physiology and Developmental Biology)

教室　Class room

Check the Course Timetable.
Science Building A, Room 408 (A408)

授業内容　Content

1. Plant Cells: Overview of plant structure; The endomembrane system; The plant cytoskeleton; The plant cell cycle; Plasmodesmata.
2. Genome Organization & Gene Expression: Nuclear genome organization; Plant cytoplasmic genomes; Post-translational regulation; Genetic modification of plants; Tools for studying plant genes
3. Mineral Nutrition & Solute Transport: Essential Nutrients; Nutritional Deficiencies; Soil, roots, and microbes.
4. Overview of Photosynthesis & Translocation in the Phloem: General concepts, Pathways of translocation; Phloem loading & unloading; Photosynthate distribution.
5. Respiration: Overview of plant respiration; Plant glycolysis; Respiration in intact plants.
6. Plant Defense & Adaptation to Abiotic Stress: Secondary metabolites & plant defense; Biotic & abiotic stresses; Adaptation & plasticity; Developmental; & physiological mechanisms.
7. Cell Walls: Structure, Biogenesis, and Expansion: Structure & synthesis; Patterns of cell expansion; The rate of cell expansion.
8. Plant Hormones in Growth and Development: AUXIN: Overview of plant growth; The auxin concepts; Transport; Signal transduction pathways; Actions & effects.
9. Plant Hormones in Growth and Development: GIBBERELLINS: Discovery & Structure; Effects on plant growth; Biosynthesis & deactivation; GA signaling; GA responses.
10. Plant Hormones in Growth and Development: CYTOKININS: Cell division & plant growth; Biosynthesis, metabolism, & transport; Cytokinin signaling; Biological roles.
11. Plant Hormones in Growth and Development: ABSCISIC ACID: Chemical structure; Biosynthesis, metabolism, & transport; Signal transduction pathways; Biological roles.
12. Plant Hormones in Growth and Development: ETHYLENE & BRASSINOSTEROIDS: Structure & biosynthesis; Signal transduction pathways; Effects on growth & development.

教科書　Textbook

Plant Physiology: International Edition (5th revised edition, 2010) by Taiz, L. and Zeiger, E., Sinauer Associates Inc., USA. ISBN: 0878935657

参考書　Recommended reading

Biochemistry & Molecular Biology of Plants (1st edition, 2002) by Buchanan, B., Gruissem, W., and Jones, R. , Wiley, USA. ISBN: 0943088399

連絡方法　Contact method

via e-mail only

その他　Remarks

*See Course List and Graduation Requirements for your program for your enrollment year.
Office hours: Thursday, 2:00 pm – 4:00 pm, or by an appointment via e-mail

See "Course List and Graduation Requirements" for your program for your enrollment year.

For more information, please visit our NU-OCW (NU-OpenCourseWare) site:
http://ocw.nagoya-u.jp/index.php?lang=en&mode=c&id=404&page_type=index

科目名　Couse Title	
Chemical Physics	
学科・専攻　Department/Program	**受講年次　Grade**
G30 Biology	3 years
授業形態　Class style	**必修・選択の別　Compulsory or Elective**
Lecture	* See "Remarks"
時間割コード　Registration code	**開講期・曜日・時限　Semester,Day & Period**
0913071	Fall semester Wed：1
単位数　Credit	**科目区分　Course type**
2	Specialized Courses

担当教員　Instructor	OKAMOTO Yuko
所属研究室　Laboratory	Theoretical Biophysics
連絡先　Contact	okamoto@tb.phys.nagoya-u.ac.jp
居室　Room	510 Science Hall

講義の目的とねらい　Course purpose

The purpose of this course is to learn about the statistical thermodynamics which can describe the behaviors of molecules in physical, chemical, and biological systems.

履修要件　Prerequisite

履修取り下げについて　Course withdrawal

<可否>　Possible
<条件>
Withdrawal is permitted up to the day that is specified by the University.

成績評価　Grading

Attendance: 10 %, Homework Sets: 20 %, Exams: 70 %

不可（F）と欠席の基準　Criteria for "Absent" &"Fail" grades

The “ Absent ” grade is reserved for students who withdraw by the day that is specified by the University. After that day, a letter grade will be awarded based on marks earned from all assessment during the semester.

関連する科目　Related courses

Biophysics, Statistical Physics I

教室　Class room

Check the Course Timetable.
ES034

授業内容　Content
1. Mathematical Tools 2. Extremum Principles 3. Heat, Work, and Energy 4. Entropy and the Boltzmann Law 5. Thermodynamic Driving Forces 6. The Logic of Thermodynamics 7. Laboratory Conditions and Free Energy 8. Maxwell's Relations and Mixtures 9. The Boltzmann Distribution Law 10. The Statistical Mechanics of Simple Gases and Solids 11. Temperature and Heat Capacity 12. Chemical Equilibria

教科書　Textbook
K.A. Dill and S. Bromberg, "Molecular Driving Forces" 2nd ed. (Garland Science).
参考書　Recommended reading
F. Reif, "Fundamentals of Statistical and Thermal Physics" (McGraw-Hill).
連絡方法　Contact method
By e-mail.
その他　Remarks
*See Course List and Graduation Requirements for your program for your enrollment year.

科目名　Couse Title	
Genetics III	
学科・専攻　Department/Program	受講年次　Grade
G30 Biology	3 years
授業形態　Class style	必修・選択の別　Compulsory or Elective
Lecture	* See "Remarks"
時間割コード　Registration code	開講期・曜日・時限　Semester,Day & Period
0913009	Fall semester Wed：2
単位数　Credit	科目区分　Course type
2	Specialized Courses

担当教員　Instructor	KANAMORI Akira
所属研究室　Laboratory	DG
連絡先　Contact	2537
居室　Room	E207
担当教員　Instructor	YAGI Yoshimasa
所属研究室　Laboratory	DG
連絡先　Contact	5039
居室　Room	E207
担当教員　Instructor	KAMIKOUCHI Azusa
所属研究室　Laboratory	
連絡先　Contact	
居室　Room	
担当教員　Instructor	GOSHIMA Gota
所属研究室　Laboratory	Division of Biological Sciences A building, room A233
連絡先　Contact	052-788-6175 goshima@bio.nagoya-u.ac.jp
居室　Room	

講義の目的とねらい　Course purpose
This course introduces the principles of molecular genetics.
履修要件　Prerequisite
Basic knowledge on molecular genetics

履修取り下げについて　Course withdrawal

<可否>　Possible
<条件>
Submit Course Withdrawal Request form by the sixth lecture.

成績評価　Grading

Evaluation will be based on in-class participation, assignments, and examinations.
Students are encouraged not to miss classes, as in-class participation will be considered an important element in overall grading.

不可（F）と欠席の基準　Criteria for "Absent" &"Fail" grades

Absent – based on submission of Course Withdrawal Request Form.
Fail – based on “ Failed ” results of examinations and assignments.

関連する科目　Related courses

教室　Class room

Check the Course Timetable.
A-408

授業内容　Content

Topics: Regulation of gene expression, genomics, systems biology, and methodology.
Textbook: Watson et al. Molecular Biology of the Gene (6th edition).

Lectures will be given by 4 faculty members of Division of Biological Science.
Chapter 16 by Akira Kanamori
Chapter 17 by Akira Kanamori and Shin Sugiyama
Chapter 18 by Shin Sugiyama
Chapter 19 by Yoshimasa Yagi
Chapter 20 by Yoshimasa Yagi and Gohta Goshima
Chapter 21, 22 by Gohta Goshima

教科書　Textbook

Molecular Biology of the Gene, James D. Watson et al. (6th edition)

参考書　Recommended reading

連絡方法　Contact method

その他　Remarks

*See Course List and Graduation Requirements for your program for your enrollment year.

科目名　Couse Title	
Computational Chemistry	
学科・専攻　Department/Program	**受講年次　Grade**
G30 Biology	3 years
授業形態　Class style	**必修・選択の別　Compulsory or Elective**
Lecture	* See "Remarks"
時間割コード　Registration code	**開講期・曜日・時限　Semester,Day & Period**
0913072	Fall semester Thu：1
単位数　Credit	**科目区分　Course type**
2	Specialized Courses

担当教員　Instructor	IRLE STEPHAN
所属研究室　Laboratory	
連絡先　Contact	Phone: 747-6397 E-mail: sirle@chem.nagoya-u.ac.jp
居室　Room	ITbM Building-302
担当教員　Instructor	YOKOGAWA Daisuke
所属研究室　Laboratory	
連絡先　Contact	Phone: 789-2851
居室　Room	ITbM Building-505

講義の目的とねらい　Course purpose

“ How can computers help with Chemistry? ” The purpose of this course is to introduce computer science from a chemist ’ s perspective. The course begins with an introduction to the basic use of computers for data search and molecular structure and spectroscopic visualization. It then introduces the programming language FORTRAN 90 on a personal computer as a way to solve simple scientific problems in an efficient way.

履修要件　Prerequisite

履修取り下げについて　Course withdrawal

<可否>　Possible
<条件>
OK.

成績評価　Grading

The final grade is composed of individual grades for homework, attendance, and final written examination.

不可（F）と欠席の基準　Criteria for "Absent" &"Fail" grades

- Missing the final exam. - Missing more than 50% of homework

関連する科目　Related courses
教室　Class room
Check the Course Timetable. ES032

授業内容　Content
1. Using the computer:Searching for information 2. Constructing and viewing 3-dimensional models of molecules: Gauss View, MOLDEN programs 3. Overview over commercial molecular modeling packages 4. Introduction to FORTRAN 90: Compilers,etc. 5. Data Types, Constants, and Variables 6. If, else if, case expressions 7. Do loops 8. Functions and subprograms 9.Application:Data processing and visualization using GNUplot 10. Molecular dynamics simulations

教科書　Textbook
Larry Nyhoff, Sanford Leestma: Introduction to FORTRAN 90 (Japanese version available)
参考書　Recommended reading
連絡方法　Contact method
E-Mail: sirle@chem.nagoya-u.ac.jp, d.yokogawa@chem.nagoya-u.ac.jp
その他　Remarks
*See Course List and Graduation Requirements for your program for your enrollment year.

科目名　Couse Title	
Cell Biology III	
学科・専攻　Department/Program	受講年次　Grade
G30 Biology	3 years
授業形態　Class style	必修・選択の別　Compulsory or Elective
Lecture	* See "Remarks"
時間割コード　Registration code	開講期・曜日・時限　Semester,Day & Period
0913010	Fall semester Thu：2
単位数　Credit	科目区分　Course type
2	Specialized Courses

担当教員　Instructor	KINOSHITA Makoto
所属研究室　Laboratory	
連絡先　Contact	
居室　Room	
担当教員　Instructor	SUGIYAMA Shin
所属研究室　Laboratory	
連絡先　Contact	
居室　Room	
担当教員　Instructor	TAKAGI Shin
所属研究室　Laboratory	DG
連絡先　Contact	5039
居室　Room	E207

講義の目的とねらい　Course purpose
This course covers basic topics in cell biology. Students who successfully co mplete this course will understand fundamental biological phenomena at the molecular and cellular levels that include the cytoskeletal systems, mitosis and meiosis, and intercellular communications in multicellular organisms. They will develop insights into the complexities of cell structure and function, the underlying molecular events, the dynamic properties of living cells, and how these contribute to the generation and functioning of the whole organism.
履修要件　Prerequisite
履修取り下げについて　Course withdrawal

<可否> Possible
<条件>
Submit Course Withdrawal Request form by the sixth lecture.

成績評価 Grading

Evaluation will be based on in-class participation, assignments, and examinations.

不可（F）と欠席の基準 Criteria for "Absent" &"Fail" grades

Absent – based on submission of Course Withdrawal Request Form.
Fail – based on “ Failed ” results of examinations and assignments.

関連する科目 Related courses

教室 Class room

Check the Course Timetable.
A-408

授業内容 Content

Oct 6, 13, 20: Chapter 17 Cytoskeleton (by Kinoshita)
Oct 27, Nov 10, 17, 24: Chapter 18 The Cell Division Cycle, Chapter 19 Sex and Genetics + α (by Sugiyama)
Dec 1, 8, 15, 22: Chapter 20 Cellular Communities: Tissues, Stem Cells and Cancer + α (by Takagi)
Jan 12: From cell biology to physiology and pathology (by Kinoshita)
Jan 19: Exam

教科書 Textbook

Essential Cell Biology (3rd ed.) Bruce Alberts et al.

参考書 Recommended reading

連絡方法 Contact method

Kinoshita
SS323
052-789-3653
kinoshita.makoto@c.mbox.nagoya-u.ac.jp

Sugiyama
E207
052-789-5039
ssugiya@bio.nagoya-u.ac.jp

Takagi
E207
052-789-5039
takagi@bio.nagoya-u.ac.jp

その他 Remarks

*See Course List and Graduation Requirements for your program for your enrollment year.

科目名　Couse Title	
Earth and Planetary Sciences	
学科・専攻　Department/Program	**受講年次　Grade**
G30 Biology	3 years
授業形態　Class style	**必修・選択の別　Compulsory or Elective**
Lecture	* See "Remarks"
時間割コード　Registration code	**開講期・曜日・時限　Semester,Day & Period**
0910818	Fall semester Fri：1
単位数　Credit	**科目区分　Course type**
2	Basic Specialized Courses

担当教員　Instructor	HUMBLET　Marc　Andre
所属研究室　Laboratory	Department of Earth and Planetary Sciences
連絡先　Contact	Phone: 052-789-3037 / E-mail: humblet.marc@f.mbox.nago ya-u.ac.jp
居室　Room	Science building E, 516

講義の目的とねらい　Course purpose

In this course students will learn about the characteristics of the planets and other components of our solar system (orbital parameters, atmospheric conditions, internal structure and composition, geomorphology, geological activity). We will use the knowledge of our own planet Earth as a reference to understand processes occurring elsewhere. During the past fifty years, various spacecrafts and exploration vehicles have been used to considerably expand our knowledge of the solar system and send back to Earth ever more detailed pictures of distant worlds. The course will review the different means of space exploration and use abundant data acquired by past and ongoing missions to illustrate the characteristics of the planets. A recurrent topic throughout the course will be the fascinating question of the existence of extraterrestrial life and its detection. We will also discuss the future of space exploration.

履修要件　Prerequisite

履修取り下げについて　Course withdrawal

<可否>　Possible
<条件>
A student who wishes to withdraw from the course must submit a withdrawal request form to the instructor by the end of May in order to receive an “ Absent ” grade.

成績評価　Grading

Students will be graded following the five-step S-A-B-C-F grade evaluation system.
S: 90-100%, A: 80-89%, B: 70-79%, C:60-69%, F: 59-0%
Two quizzes: 30% (15% each)
Oral presentation: 20%
Written essay: 50%

不可（F）と欠席の基準　Criteria for "Absent" &"Fail" grades

A student will be given an “ Absent ” grade if he or she submits a Course Withdrawal Request by the end of May. This deadline does not apply to students who drop the class part-way through for an exceptional reason (e.g. illness, accident). A “ Fail ” grade is given to students who obtain a final score of less than 60%.

関連する科目　Related courses

Fundamental of Earth Science I & II

教室　Class room

Check the Course Timetable.

授業内容　Content

1. Introduction to the Solar System
2. Space exploration
3. The Earth and Moon
4. Asteroids, comets and meteorites
5. Mercury
6. Venus
7. Mars
8. Jupiter
9. Saturn
10. Uranus, Neptune and the Kuiper Belt

教科書　Textbook

参考書　Recommended reading

連絡方法　Contact method

その他　Remarks

*See Course List and Graduation Requirements for your program for your enrollment year.

科目名　Couse Title	
Biochemistry III	
学科・専攻　Department/Program	**受講年次　Grade**
G30 Biology	3 years
授業形態　Class style	**必修・選択の別　Compulsory or Elective**
Lecture	* See "Remarks"
時間割コード　Registration code	**開講期・曜日・時限　Semester,Day & Period**
0913011	Fall semester Fri：2
単位数　Credit	**科目区分　Course type**
2	Specialized Courses

担当教員　Instructor	SAWADA Hitoshi
所属研究室　Laboratory	Marine Developmental Biochemistry
連絡先　Contact	ex.2514, hsawada@bio.nagoya-u.ac.jp
居室　Room	Building B, room 315

講義の目的とねらい　Course purpose

This course focused on the metabolisms of biomolecules (Part IV, METABOLISM in the textbook), including carbohydrates, lipids, amino acids/proteins, and nucleic acids. The students learn the concept of free energy, mechanism of ATP production, catabolism and anabolism of biomolecules.

履修要件　Prerequisite

Prerequisite:
Biochemistry I and II
Basic knowledge of biology and chemistry

履修取り下げについて　Course withdrawal

<可否>　Possible
<条件>
Submit Course Withdrawal Request form by the sixth lecture.

成績評価　Grading

Evaluation will be based on in-class participation, assignments and examinations.
Presence will be marked. In-class participation will be considered an important element in overall grading.

不可（F）と欠席の基準　Criteria for "Absent" &"Fail" grades

Absent – based on submission of Course Withdrawal Request Form.
Fail – based on “ Failed ” results of examinations and assignments.

関連する科目　Related courses

Cell Biology I and II

教室　Class room
Check the Course Timetable. A408

授業内容　Content
1. Bioenergetics 2. Glycolysis and the pentose phosphate pathway 3. Additional pathways in carbohydrate metabolism (Glycogen metabolism and gluconeogenesis) 4. The citric acid cycle 5. Mitochondrial ATP synthesis 6. Photosynthesis 7. Synthesis and degradation of lipids 8. Synthesis and degradation of amino acids 9. Regulation of fuel metabolism

教科書　Textbook
Principles of Biochemistry (2013), International Student Version (Fourth edition) by Donald Voet, Judith G. Voet, Charlotte W. Pratt (John Wiley & Sons)
参考書　Recommended reading
Molecular Biology of the Cell, by B. Alberts et al. (Taylor & Francis; 5th Revised Edition) Biochemistry, 3rd Edition, by Donald Voet, Judith G. Voet (John Wiley & Sons) Principles of Biochemistry, by A.L. Lehninger et al. (W.H.Freeman & Co.)
連絡方法　Contact method
E-mail (Hitoshi Sawada: hsawada@bio.nagoya-u.ac.jp) or phone call (052-789-2514).
その他　Remarks
*See Course List and Graduation Requirements for your program for your enrollment year.