

Fundamentals of Physics III			
Registration Code	0051221	Credits	2.0
Course Category	Sciences Basic		
Term (Semester) / Day / Period	G-II (1st year, Spring Quarter 1) / Mon., Wed. / 2 (10:30~12:00)		
Instructor	TANIYAMA Tomoyasu		
Target Schools (Programs)	Sc(P·C·B)·En(P·C·Au)·Ag(B)		
<p>●Objective of the Course This is the third of a series of FP courses that cover the fundamentals of physics. It introduces the basic concepts and laws of electricity and magnetism, as well as their applications to solving a range of problems. Students will also be encouraged and guided to solve problems using different methods.</p> <p>●Course Prerequisites Fundamentals of Physics I & II and Calculus I&II.</p> <p>●Course Contents Chapter 21: Electric Charge Chapter 22: Electric Fields Chapter 23: Gauss' Law Chapter 24: Electric Potential Chapter 25: Capacitance Chapter 26: Current and Resistance Chapter 27: Circuits Chapter 28: Magnetic Fields Chapter 29: Magnetic Fields Due to Currents Chapter 30: Induction and Inductance</p> <p>●Evaluation Methods Class attendance is required -- absentee must give a valid reason (e.g. doctor's certificate). A student will receive the ABSENT grade if his lecture attendance is below 75% or he does not sit for either Intermediate Exam or Final Exam without valid reason. After either exam, a student who wishes to receive the ABSENT grade must see Prof. TANIYAMA within one week after the exam. Students need to submit a Course Withdrawal Request Form when requesting course withdrawal. Weightage of course components: Class participation and attendance: 5%, Lecture Assignment: 15%, Intermediate Exam: 40%, Final Exam: 40%</p> <p>●Notice for Students This course is as intensive as (if not more) than other FP courses. You are expected to register for Fundamental Physics Tutorial IIa (FPTIIa) and to spend at least several hours per week studying in order to do well.</p>			
Textbook	Fundamentals of Physics Extended 9th or 10 th Edition International Student Version with WileyPLUS Set by Halliday, Resnick and Walker (John Wiley & Sons) 978-1-118-23072-5		
Reference Book	Feynman Lectures On Physics (Vol. 2) by Richard Phillips Feynman (Pearson PTR)		

Fundamentals of Physics IV			
Registration Code	0051222	Credits	2.0
Course Category	Sciences Basic		
Term (Semester) / Day / Period	G-II (1st year, Spring Quarter 2) / Mon., Wed. / 2 (10:30~12:00)		
Instructor	GELLOZ Bernard Jacques		
Target Schools (Programs)	Sc(P·C·B)·En(P·C·Au)·Ag(B)		
<p>●Objective of the course This is the last of a series of four courses that cover the fundamentals of physics. It focuses on mechanical and electromagnetic waves, as well as optics. Both conceptual understanding and problem solving will be emphasized. Some applications will also be discussed. Understanding waves and optics is important as preparation for more advanced subjects, for example in quantum mechanics, chemistry, and engineering.</p> <p>●Course Prerequisites Fundamentals of Physics I & II. Concurrent registration for <i>Fundamentals of Physics III</i> is required. Registration for <i>Fundamentals of Physics Tutorial IIb</i> is recommended as it serves as tutorial for this course.</p> <p>●Course content - Review of mechanical oscillations (part of chapter 15) - Short introduction to electromagnetic oscillations (part of chapter 30) - Fundamentals of waves and mechanical waves (chapter 15) - Introduction to Maxwell's equations (part of chapter 32) - Electromagnetic waves (chapter 33) - Images (geometrical optics) (part of chapter 34) - Optical interference (chapter 35) - Introduction to optical diffraction (part of chapter 36)</p> <p>●Evaluation methods Need to submit a Course Withdrawal Request Form when students have no intention of finishing a course during the semester. Deadline for submitting this request is just before the final examination. Weightage of course components : Class attendance: 10%; Intermediate tests: 40%; Final test: 50%</p> <p>●Notice for students With two lectures and a tutorial (if you register for it) per week, it is important to work regularly and immediately clear any misunderstanding in order to do well in the course and tutorial.</p>			
Textbook	Fundamentals of Physics Extended 10th Edition International Student Version with WileyPLUS Set (John Wiley & Sons, 2010 ISBN-13: 978-1118230725)		
Reference Book	Feynman Lectures On Physics (Vol. 2) by Richard Phillips Feynman (Pearson P T R)		

Basic Mathematics			
Registration Code	0051321	Credits	2.0
Course Category	Sciences Basic		
Term (Semester) / Day / Period	G-II (1st year, Spring Semester) / Mon. / 3 (13:00 – 14:30)		
Instructor	DARPÖ Erik Olof		
Target Schools (Programs)	Hu(J)·La(S)·Ec(S)		
<p>●Objective of the Course The main objectives of this course are to review high school mathematics and to deepen knowledge and understanding of basic calculus and linear algebra in order to get the necessary proficiency to apply mathematics to economics and social sciences.</p> <p>●Course Prerequisites No particular prerequisites. Basic skills in manipulating algebraic expressions, solving equations etc. will be helpful.</p> <p>●Course Contents The course consists of the following sections:</p> <ol style="list-style-type: none"> 1. Lines and their slopes 2. Introduction to functions, Functions and their graphs 3. Combinations of functions 4. Transformations of functions 5. Quadratic functions 6. Polynomial functions 7. Rational functions 8. Exponential and logarithmic functions 9. Systems of equations and inequalities 10. Derivatives <p>●Evaluation Methods The examination consists of a midterm exam (35% of the total score), a final exam (45%), homework (10%) and quizzes (10%).</p> <p><i>Course withdrawal:</i> Any student who does not participate in the final exam will receive the grade “Absent”. It is not necessary to submit a course withdrawal request form.</p> <p>●Notice for Students It is recommended to prepare for each lecture by reading corresponding chapter in the textbook in advance. As the students at this course are likely to have rather different backgrounds in and knowledge of mathematics, the workload required to follow the course will vary depending on individual circumstances.</p>			
Textbook	Rhonda, Huettenmueller: <i>Pre-calculus demystified</i> , second edition McGraw-Hill Education; 2 edition (2012) ISBN-13: 978-0071778497		
Reference Book	None.		

Laboratory in Biology A			
Registration Code	0011371	Credits	1.5
Course Category	Sciences Basic		
Term (Semester) / Day / Period	G-II(1st year, Spring Semester) /Mon./3 (13:00~14:30), 4 (14:45~16:15)		
Instructors	OHKAWA Taeko, DOI Kazuyuki		
Target Schools (Programs)	Ag(B)		
<p>●Objective of the Course The aim of this course is to provide freshman/sophomore level students with the conceptual framework, factual knowledge, and analytical skills necessary to deal critically with the rapidly changing science of biology and to understand the applications of biology. The work of the course is done via a series of laboratory exercises. Students are required to attend all the classes. Students shall inform their instructors of dates they will miss class due to an excused absence prior to the date of that anticipated absence. There are no exams, but students are required to write laboratory reports.</p> <p>●Course Prerequisites None.</p> <p>●Course Contents 1-1-1 Tree Identification 1-1-2 Interspecific comparison of tree leaves 1-1-3 Tree census 1 1-1-4 Tree census 2 (Analyses of tree census data) 1-2-1 Morphology of Plant 1 (Plant tissue systems and their cellular structures) 1-2-2 Morphology of Plant 2 (Leaf Surface Structure) 1-2-3 Morphology of Plant 3 (Structure of seedlings) 1-2-4 Protein Electrophoresis (SDS-Polyacrylamide Gel Electrophoresis) 1-3-1 Morphology of Animals 1 (Dissection of the goldfish) 1-3-2 Morphology of Animals 2 (Observation of Animal Tissue Sections) 1-3-3 Vertebrate Hormones (Regulation of metamorphosis in the African clawed frog larvae) 1-3-4 Morphology of Aves (Anatomy of the digestive system and urogenital system of the quail)</p> <p>●Evaluation Methods Grading will be based on attendance, lab reports, and assessment of performance in the lab. The course withdrawal system is adopted. Students can withdraw from this course by submitting a request by the end of May</p> <p>●Notice for Students</p>			
Textbook	Will be introduced in the class.		
Reference Book	None.		

Linear Algebra II			
Registration Code	0052221	Credits	2.0
Course Category	Sciences Basic		
Term (Semester) / Day / Period	G-II (1st year, Spring Semester) / Tue. / 2 (10:30~12:00)		
Instructor	DARPÖ Erik Olof		
Target Schools (Programs)	Hu(J)·La(S)·Ec(S)·Sc(P·C·B)·En(P·C·Au)·Ag(B)		
<p>●Objectives of the Course Linearity is one of the most fundamental concepts for the handling of quantities in current natural science. Indispensable in quantum mechanics and relativity, its use has spread across all branches of natural science and beyond. Linear algebra, developed in the nineteenth century, is the mathematical theory of linearity. The second half of this one-year course focuses on advanced concepts of Linear algebra, such as the notion of a (real) vector space, orthogonal maps, determinants, eigenvalues and eigenvectors. Its purpose is to give a deeper and broader understanding of the mathematical theory of linearity, as well as increased proficiency in mathematical reasoning and proof techniques.</p> <p>●Course Prerequisites While not a formal requirement, Linear Algebra I is strongly recommended</p> <p>●Course Contents Orthogonal maps, vector spaces, determinants and their applications, eigenvalues and eigenvectors, applications of eigenvalue theory, linear differential equations.</p> <p>●Evaluation Methods and Criteria There will be two main, written exams: midterm (35%) and final (45%). Additionally, there will be homework assignments (10%) and quizzes (10%). The final grade will be determined by the total amount of points obtained according to the following scale: S: 90-100, A: 80-89, B: 70-79, C: 60-69, F:0-59.</p> <p><i>Course withdrawal:</i> Any student who does not participate in the final exam will receive the grade “Absent”. It is not necessary to submit a course withdrawal request form.</p> <p>●Notice for Students</p> <ol style="list-style-type: none"> 1. The reference book is available in the Main library and in the Science library (enough copies in total for all students). 2. It is strongly recommended to register also to Mathematics Tutorial II b. 			
Textbook	None.		
Reference Book	Otto Bretscher: <i>Linear Algebra with Applications</i> , fourth edition, Pearson		

Laboratory in Biology B			
Registration Code	0012372	Credits	1.5
Course Category	Sciences Basic		
Term (Semester) / Day / Period	G-II (1st year, Spring Semester) / Tue./ 3 (13:00~14:30), 4 (14:45~16:15)		
Instructors	HISAMOTO Naoki, KINOSHITA Toshinori		
Target Schools (Programs)	Sc(P·C·B)·En(P·C)		
<p>●Objective of the Course</p> <p>Investigation and experimentation forms the foundation of science knowledge and is one of the core skills needed for scientific inquiry. This training course is designed to help students become familiar with experimental and explorative techniques for observation, description, and analysis of plant, animal and microbiological activities at the organismal, cellular, and molecular levels.</p> <p>●Course Prerequisites</p> <p>None</p> <p>●Course Contents</p> <ol style="list-style-type: none"> 1. Safety management for experiments 2. Microscope and plant cells 3. Floral development and shoot gravitropism in plants 4. Separation of photosynthetic pigment by paper chromatography 5. Observation of yeast cell cycle 6. Observation of <i>Caenorhabditis elegans</i>: mutation effects on morphology and behavior 7. Comparative observation of human blood cells and epithelial cells 8. Morphology and escape behavior of zebrafish larvae 9. Programmed cell death during chicken embryogenesis 10. Medaka teach us evolution and biodiversity 11. The chromosome as a data storage device 12. Characterization of the enzyme <p style="text-align: center;">The contents are subject to change depending on circumstances.</p> <p>●Evaluation Methods</p> <p>Valuation will be based on lab reports and assessment of performance in the lab. Notes on course withdrawal system: If you wish to withdraw from this course, you should do so by the end of May. If you attend classes more than three times (without withdrawing from the course), your grade will be either S, A, B, C, or F.</p> <p>●Notice for Students</p> <p>We will explain in the 1st class, but lab coat and safety glasses are necessary for experiments.</p>			
Textbook	Will be distributed in the first class of this course.		
Reference Book	None.		

Fundamentals of Earth Science II			
Registration Code	0052521	Credits	2.0
Course Category	Sciences Basic		
Term (Semester) / Day / Period	G-II (1st year, Spring Semester) / Tue. / 5 (16:30~18:00)		
Instructor	HUMBLET Marc Andre		
Target Schools (Programs)	Sc(P·C·B)·En(P·C·Au)·Ag(B)		
<p>●Objective of the Course In the course “Fundamentals of Earth Science II” we examine the interactions between humanity and the Earth system. The Earth is a dynamic planet where the evolution of the environment and that of life are closely related. Human societies have been, and still are, profoundly influenced by climate change and catastrophic geologic events, such as volcanic eruptions and earthquakes. Entire civilizations have been decimated by droughts, and major cities have been destroyed by ground shaking, tsunamis or pyroclastic flows. Today the growing human population and its use of natural resources are affecting the environment on a global scale to an extent never attained before. Learning about the interactions between humanity and the Earth system is needed to use Earth’s limited natural resources in a sustainable manner, minimize the risks of natural hazards and envisage a safe future for us all.</p> <p>●Course Prerequisites This course has no prerequisite, but prior completion of “Fundamentals of Earth Science I” is recommended.</p> <p>●Course Contents</p> <ol style="list-style-type: none"> 1. Introduction 2. Volcanoes 3. Seismology I: Earthquakes 4. Seismology II: Reconstruction of Earth’s Interior 5. Biogeochemical cycles I: The Water Cycle 6. Biogeochemical cycles II: The Carbon Cycle 7. Climate I: Introduction to the Climate System 8. Climate II: Natural Variations 9. Climate III: Recent Global Change 10. Geological Resources <p>●Evaluation Methods Two quizzes (multiple choice): 20% (10% each) Mid-term exam: 40% Final exam: 40%</p> <p><i>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%</i></p> <p><i>A student who wishes to withdraw from the course needs to submit a <u>Course Withdrawal Request Form</u> by the end of May in order to receive an “Absent” grade. This deadline does not apply to students who drop the class part-way through for an exceptional reason (e.g. illness, accident).</i></p> <p>NB: A review session will be organized once a week in addition to regular class time for students who wish to receive additional information about the course content.</p>			
Textbook	None.		
Reference Book	Title: Understanding Earth Authors: John Grotzinger & Thomas H. Jordan Publisher: W. H. Freeman Issue year: 2014 (7 th edition) ISBN: 978-1464138744		

Information Literacy			
Registration Code	0013301	Credits	2.0
Course Category	Sciences Basic		
Term (Semester) / Day / Period	G-II (1st year, Spring Semester) / Wed. / 3 (13:00~14:30)		
Instructor	KURIMOTO Hidekazu		
Target Schools (Programs)	Hu(J)·La(S)·Ec(S)		
<p>●Goal and Objectives of the Course The goal of this course is to help students master, through lectures and practical training, the fundamentals of information literacy. This refers to the ability to use information and communication technology such as computers and online networks for the gathering, transmission, organization and analysis of information. While the internet allows us to gather and transmit information at will, there are a few standard rules that need to be followed. The objectives of the course is for students to learn how to use computers and networks by fully understanding these basic rules.</p> <p>●Course Prerequisites Students must be able to use the e-mail user account listed in the Nagoya University ID Notification.</p> <p>●Course Contents (01) Information Literacy overview (02) Overview of computer literacy, and word processing (03) Electronic mail and information exchange (04) Information security (05) Ethics and etiquette in a network information-based society (06) Information retrieval system (basic) (07) Searching for information on the internet (applied / translation) (08) The science and technology supporting an information-based society. (09) Information representation on web pages (basic) (10) Information representation on web pages (applied) (11) Information processing using spreadsheet software (basic) (12) Information processing using spreadsheet software (applied) (13) Information processing using spreadsheet software (advanced) (14) How to make PowerPoint presentation (15) Actual presentation using PowerPoint The course will cover the content above, but the order may vary slightly. In order to promote autonomous learning through e-learning contents, experiments will be conducted using academically effective practical methods and content.</p> <p>●Evaluation Method and Criteria A withdrawal system is used for students wishing to withdraw from this course. Students will be evaluated in comprehensively on performance in reporting (70%) and class participation (30%). * Details will be given during the first lecture.</p> <p>●Notice for Students The enrollment capacity for G30 program is 8 students. Always carry your Nagoya University ID (account) and password with you. The practical training classes are inter-related and lateness or absence will interfere with the class.</p>			
Textbook	None. (Course-related links) http://www.human.nagoya-u.ac.jp/~kuri/lect/nulias.html		
Reference Book	Will be given accordingly during class. The topics being covered in each lecture are posted on the web page.		

Laboratory in Chemistry			
Registration Code	0053321	Credits	1.5
Course Category	Sciences Basic		
Term (Semester) / Day / Period	G-II(1st year, Spring Semester) / Wed. / 3 (13:00~14:30), 4 (14:45~16:15)		
Instructors	SAMJESKE Gabor Arwed, BUTKO Peter, SHUKU Yoshiaki		
Target Schools (Programs)	Sc (P·C·B)·En (P·C·Au)·Ag (B)		
<p>●Objective of the Course The objective of this course is to learn how to effectively perform experiments in a detailed, oriented manner including carefully taking notes of the procedures, findings, and questions that may arise from the experiments. The other objective is to clearly and concisely convey to others the findings of the experiments that support your conclusion. Motto: Perform the experiments by yourself, visually observe and record what happened in the experiments, and report the results clearly.</p> <p>●Course Prerequisites Students must have taken, or be taking concurrently, at least one of the following courses: Fundamentals of Chemistry 1, Fundamentals of Chemistry 2. IMPORTANT: This course is a PREREQUISITE for 0681100 ANALYTICAL CHEMISTRY, Year 2, Term III, Fall Semester</p> <p>●Course Contents week 1: Orientation and Safety Walkthrough. week 2: Lecture 1 Reaction of Inorganic Ions and Ion Exchange Equilibrium. week 3: Experiment 1 a. Estimation of Liquid Quantity. b. Dissolution of Salts. c. Water Soluble Salts and Solubility. week 4: Experiment 2 a. Reaction of Metal Ions with Hydrogen Sulfide. b. Metal Hydroxides. week 5: Experiment 3 a. Separation of Inorganic Ions and their Identification. week 6: Lecture 2 Synthesis of Organic Compounds and Inorganic Compounds, Volumetric Analysis and Titration. week 7: Experiment 4 a. Synthesis of Acetylsalicylic Acid. b. Measurement of Melting Point. week 8: Experiment 5 a. Synthesis of Potassium Trioxalate Ferrate (III) Trihydrate. b. Photochemical Reaction. week 9: Experiment 6 a. Titration of Monovalent Acids. week 10: Lecture 3 Energy of Electromagnetic Waves and Spectra, Rate of Chemical Reaction and Energy. week 11: Experiment 7 a. Atomic Spectra and Atom Structure. b. Spectra of Various Light Sources. week 12: Experiment 8 a. Absorption Spectrum of Phenolphthalein. b. Determination of Concentration by Absorption Photometry. week 13: Experiment 9 a. Chemical Oscillation Reactions.</p> <p>●Evaluation Methods Attendance is necessary for every week. In the event of a missed class due to a serious illness, accident or family emergency, compelling written documentation of the reason for the absence will be required. Tardiness will negatively impact your grade. You must submit your assignment every week. Plagiarism of assignments will not be tolerated. Grading is based on participation in discussion and Q&A (8%), experiment reports (72 %), final oral conversation (20 %); TOTAL: 100 %. The Nagoya University course withdrawal system is adopted. Students need to submit a Course Withdrawal Request Form when students have no intention of finishing the course during the semester.</p>			

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% (below 59 pts).

WARNING: Missing more than three classes (it does not matter whether excused or not) means automatically failing the course.

Textbook	Introductory Chemistry Laboratory Manual, Shizuaki Murata, Fumi Urano, and Masahiro Yoshimura, Hideto Ito (Nagoya University, 2019)
Reference Book	None.

Special Mathematics Lecture (Statistics)			
Registration Code	0053621	Credits	2.0
Course Category	Sciences Basic		
Term (Semester) / Day / Period	G-II (1st year, Spring Semester) / Wed. / 6 (18:15~19:45)		
Instructor	RICHARD Serge		
Target Schools (Programs)	Hu(J)·La(S)·Ec(S)·Sc(P·C·B)·En(P·C·Au)·Ag(B)		
<p>●Objective of the Course Statistics deals with the collection, the analysis, the interpretation and the representation of data, always with the notion of uncertainty in the background. It plays a central role in many scientific investigations, and it is one of the most popular mathematical tools used in the industry. During this one semester course, the basic notions of statistics will be introduced. Depending on the interest of the audience, various concrete applications will be further developed.</p> <p>●Course Prerequisites Basic knowledge on calculus and linear algebra, as provided in Calculus I & II and in Linear algebra I & II. Some knowledge on probability as available on http://www.math.nagoya-u.ac.jp/~richard/lecturefall2017.html would also be useful, but the necessary material will be briefly reviewed at the beginning of the course. Motivated 1st year students can also attend without these prerequisites but after a discussion with the instructor.</p> <p>●Course Contents (preliminary version) Probability (a short reminder) Common distributions Statistical inference Hypothesis testing Regression models Further applications</p> <p>●Evaluation Methods The final grade will be based on the active participation during the lectures and on some written reports. It is necessary to submit a Course Withdrawal Request Form when the student has no intention of finishing the course during the semester.</p> <p>●Notice for Students This course is an optional subject which does not count towards the number of credits required for graduation in any program at Nagoya University.</p>			
Textbook	Material will be provided during the lectures		
Reference Book	Reference books will be provided during the lectures		

Fundamentals of Biology II			
Registration Code	0054223	Credits	2.0
Course Category	Sciences Basic		
Term (Semester) / Day / Period	G-II (1st year, Spring Semester) / Thu. / 2 (10:30~12:00)		
Instructor	VASSILEVA Maria		
Target Schools (Programs)	Sc(P·C·B)·En(C·Au)·Ag(B)		
<p>●Objective of the Course This course`s main focus is to provide students with working understanding on how human body functions and the ability to use this knowledge to take informed decisions in everyday health-related situations. Further, short introduction is given on basic concepts of ecology. These sections will allow students to critically evaluate agricultural and ecological issues. The course emphasizes on conceptual understanding of the biological topics discussed, rather than on memorization of terms and facts. Course assignments are prepared with the goal of providing an opportunity to practice conceptual and analytical thinking. Students will have a regular opportunity to engage in discussions, and hone their teamwork skills on team projects.</p> <p>●Course Prerequisites There is <u>no prerequisite knowledge for this course</u>. Even students who didn`t take Fundamentals of Biology 1, or didn`t study Biology in high school, are encouraged to join. Exchange students are also welcome.</p> <p>●Course Contents</p> <ol style="list-style-type: none"> 1. Introduction to the basics of life 2. Animal anatomy and physiology <ol style="list-style-type: none"> 2.1 Unifying concepts of animal structure and function 2.2 Nutrition and digestion 2.3 Gas exchange 2.4 Circulation 2.5 The immune system 2.6 Control of water balance 2.7 Hormones and the endocrine system 2.8 Reproduction and embryonic development 2.9 Nervous system 2.10 The senses 2.11 How animals move 3. Introduction to Ecology <ol style="list-style-type: none"> 3.1 The biosphere: an introduction to Earth`s diverse environments 3.2 Behavioral adaptations to the environment 3.3 Population ecology 3.4 Communities and ecosystems 3.5 Conservation biology <p>●Evaluation Methods Evaluation is based on in-class participation (10%), group assignments (10%), individual written assignments (10%) and exams (total of 70%). Weekly written assignments - summary of the upcoming class material in the form of mindmap - are the core assignments for this course. Exams emphasize on analytical and problem-solving skills.</p> <p>* Students who do not intent to complete the course need to submit a Course Withdrawal Form. This can be done at any time during the course.</p>			

●Notice for Students

* Mastering Biology (www.masteringbio.com) is an online system that accompanies the main textbook for this course. This system will not be integrated into the course assessment methods. The choice of acquiring an access and using it will be left to the discrepancy of each individual student.

* Students are expected to read the appropriate textbook chapter before class. Classes emphasize discussions and problem-solving questions, thus coming prepared is essential.

Textbook	1. Campbell Biology: Concepts & Connections, 7th Ed. or later Jane B. Reece / Martha R. Taylor / Eric J. Simon / Jean L. Dickey Benjamin Cummings, 2011 (The same textbook as in Fundamentals of Biology 1) 2. OpenStax Biology Free downloadable textbook (http://openstaxcollege.org) This is an excellent alternative to the main textbook for the course.
Reference Book	None.

Fundamentals of Chemistry II			
Registration Code	0054321	Credits	2.0
Course Category	Sciences Basic		
Term (Semester) / Day / Period	G-II (1st year, Spring Semester) / Thu. / 3 (13:00~14:30)		
Instructor	SHIN Jiyong		
Target Schools (Programs)	Sc(P·C·B)·En(P·C·Au)·Ag(B)		
<p>●Objective of the Course The main purpose of this course is to grasp what chemistry is all about and to learn the respective key principles and elementary knowledge in different subjects of chemistry. Fundamentals of Chemistry II begins with chemical kinetics and equilibrium, advances to thermodynamics and electronics, and finishes with chemical structures, properties, and reactions.</p> <p>●Course Prerequisites Fundamentals of Chemistry I</p> <p>●Course Contents Chapter 13. Chemical Kinetics Chapter 14. Chemical Equilibrium Chapter 15. Aqueous Equilibria: Acids and Bases Chapter 16. Applications of Aqueous Equilibria Chapter 17. Thermodynamics: Entropy, Free Energy, and Equilibrium Chapter 18. Electrochemistry Chapter 19. Nuclear Chemistry Chapter 20. Transition Elements and Coordination Chemistry Chapter 21. Metals and Solid-State Materials Chapter 22. The Main-Group Elements Chapter 23. Organic and Biological Chemistry</p> <p>●Evaluation Methods Examination [total 70%: two midterms (20% for each) and one Final (30%)], Attendance (10%), and Assignments (20%).</p> <p>●Notice for Students <u>Course withdrawal and failure:</u> In the cases of any unavoidable reasons such as sickness, accident, or no attendance school, student(s) may get a grade of 'Absent' through the judgment of the course-instructor and the students, when the student(s) submit a 'Course Withdrawal Request Form' to receive the 'Absent' grade. Furthermore, no submission of sickness/absence reports and lack of attendance score will result in 'F' grade. It is for the protection of other attendances in the course from frequent absences of specific/uncertain student(s). <u>Cautious information:</u> Whoever provides any suspicious action in any exam will lose his/her entire credits of all coursework in the semester, which is the University law.</p>			
Textbook	Chemistry(John E. McMurry, Robert C. Fay, and Jill K. Robinson), Seventh Edition, : Global edition, 2016 (ISBN 10: 9781292092751)		
Reference Book	None.		

Calculus II			
Registration Code	0055221	Credits	2.0
Course Category	Sciences Basic		
Term (Semester) / Day / Period	G-II (1st year, Spring Semester) / Fri. / 2 (10:30~12:00)		
Instructor	RICHARD Serge		
Target Schools (Programs)	Hu(J)·La(S)·Ec(S)·Sc(P·C·B)·En(P·C·Au)·Ag(B)		
<p>● Objectives of the Course: Analysis is the field of mathematics that describes and analyzes quantitative changes, and the central methods are differential and integral calculus. These methods are essential techniques in natural science, and have recently found increasing applications also in social sciences. The aim of the second half of this one-year course is to provide a solid understanding of functions of several real variables.</p> <p>● Course Prerequisites: Some notions on functions of one variable, as seen in Calculus I. A basic knowledge of linear algebra will be an asset.</p> <p>● Course Content: The basic notions related to the study of functions of several variables, as for example: partial derivatives, maximum and minimum, implicit functions theorem, multiple integrals, change of variables, Jacobian matrix, surface and line integrals. Some elements of vector calculus will also be introduced.</p> <p>● Evaluation Methods and Criteria: The final grade will be determined by quizzes (30%), the midterm (30%) and a final exam (40%). The grading scale will be S: 90-100, A: 80-89, B: 70-79, C: 60-69, F: 0-59. It is necessary to submit a Course Withdrawal Request Form when the student has no intention of finishing the course during the semester.</p> <p>● Notice for Students: It is strongly encouraged to attend the Mathematics Tutorial IIa which is linked to this course.</p>			
Textbook	None.		
Reference Book	Free reference books or lecture notes are available on the website of the course.		