| Code Subject Da                            | iy/Perio<br>d | Categories                             | Credit(<br>s) Object Instructor (Position) Seme<br>ster   | Languag<br>e Used<br>in<br>Course<br>E:Englis<br>h<br>J:Japan | g<br>Class<br>s Subject                     | Object and Summary of Class   | Goal of Study  | Contents and Progress Schedule of the Class   | Evaluation Method  | Textbook 1 -<br>Textbook<br>Title   | - Textbook<br>1 -<br>Publishe<br>r<br>Year | <sup>k</sup> Textbook<br>1-<br>ISBN/ISS<br>N | Textbook<br>1 -<br>Textbook<br>/<br>Referenc<br>e Textbook 2 -<br>Textbook<br>2 -<br>Aurthur<br>Publishe<br>r  | extbook<br>2 -<br>ublicati<br>on<br>Year Xextbook<br>ISBN/ISS<br>N<br>Referenc<br>e | L Preparation and Review   | In Addition   |
|--|---------------|--|---|---|---|---|--|---|--|---|--|--|--|---|--|---|
| CB21207 Economics Fai<br>Tu                | I,<br>e/1st   | Expansion Subjects-<br>Social Sciences | 2 FGL Dan QIN<br>(Graduate School of<br>Economics and Management)<br>*AMB<br>:4<br>seme<br>ster | E   | Japanese<br>Business<br>and<br>Economy A    | This course studies the behavioral foundations of<br>Japanese business and economics. The objective of thi<br>course is twofold. In the first place, students will learn<br>basic microeconomic methods in modelling individual<br>behavior. In the second place, we will introduce and<br>discuss several examples of non-standard behavior that<br>are common among Japanese people. We will then<br>discuss the modelling of such types of behavior. | Upon the completion of this course, students will come to understand the difference between real life<br>is decision making (in the case of Japanese people) and the behavioral patterns assumed by classical<br>economic theory. Students are also expected to be able to build simple models explaining nonstandard<br>behavior.   | We will first introduce the economic sense of "rationality" and then discuss several typical behavior deviating from thi hypothesis. At the end of this class, students will give presentations about typical nonstandard behaviors in their own culture.         1) Orientation and introduction [         2) Rational decision maker in the economic sense: Preference maximization hypothesis [         3) Properties of preference and utility[   | is Students will be evaluated by class participation (40%) and presentation (60%).   | The Japanese<br>Mind:<br>Understanding<br>Contemporary<br>Japanese<br>Culture                     | Tuttle 2002                                | 080483299                                    | Reference       Advanced       Jehle G.       Prentice       20         Microeconomi       A., Reny P.       Hall       Hall </td <td>11 978027373 Reference<br/>1917</td> <td>Students are required to<br/>prepare presentations reflecting<br/>the typical behavior of their own<br/>culture.</td> <td></td> | 11 978027373 Reference<br>1917  | Students are required to<br>prepare presentations reflecting<br>the typical behavior of their own<br>culture.  |   |
| CB22250 Biology A Fal<br>Tu                | I,<br>e/2nd   | Expansion Subjects-<br>Biology         | 2 FGL ROBERT, Martin 2<br>(Institute for Excellence in<br>Higher Education)                     | E   | Essential<br>Cell Biology                   | The cell is the fundamental unit of life. Its understanding<br>is essential for any aspiring student or researcher in the<br>natural sciences. The objective of this course is to learn<br>the fundamental principles of cell biology by studying the<br>cell's structure, organization, and the basic biochemical<br>mechanisms and functions linked to the maintenance,<br>replication and expression of its genetic information.                     | After this course, the student will have a solid grasp of basic cellular and information processing functions<br>including its components, DNA structure, replication and repair, gene expression, cellular communication<br>and the cell cycle. To do this, the main components, structures and information processing systems of the<br>cell will be introduced and explored. In addition, the important connectivity among all cellular components<br>and functions and a view of the cell as a non-reducible system will be emphasized.<br>Some of the specific learning objectives include:<br>•Understand the cell's fundamental role in all living systems<br>•Explain the fundamental differences between prokaryotic and eukaryotic cells from both a structural and<br>evolutionary perspective<br>•Understand the function of the main cellular components and how they are connected to the living proces<br>•Describe the basic components and mechanisms involved in DNA replication and repair, gene expression<br>(transcription and translation) and their regulation<br>•Explain the basic mechanisms of gene and genome evolution<br>•Explain the basic mechanisms of gene and genome evolution<br>•Understand principles of cell signaling and information processing<br>•Describe the main phases of the cell cycle and regulation as well as the properties of cell communities<br>•Realize the importance of studying the cell in order to understand living organisms, ecosystems, as well is<br>health and disease. | <ul> <li>1)The fundamental unit of life (cell theory and the cell as a complex system)         <ul> <li>2)Basic cell structure and architecture (prokaryotic and eukaryotic) 1</li> <li>3)Basic cell structure and architecture (prokaryotic and eukaryotic) 2</li> <li>4)Review of the basic chemical composition of cells</li> <li>5)DNA and chromosomes (structure and function, chromatin remodeling)</li> <li>6)DNA replication, repair, and recombination</li> <li>7)From DNA to RNA (transcription and RNA processing)</li> <li>8)Mid-term examination. From RNA to proteins (the genetic code, translation and protein synthesis)</li> <li>9)Gene and genomes (structure, function, and evolution)</li> <li>10)Analyzing genes and genomes</li> <li>11)Control of gene expression (transcriptional and post-transcriptional mechanisms) and epigenetics</li> <li>n</li> <li>12)Cell signaling 1 (principles and concepts)</li> <li>13)Cell signaling 2 (membrane receptors and signaling mechanisms)</li> <li>14) The cell cycle and cell division (overview, phases, and regulation)</li> </ul> </li> </ul>  | Attendance and active<br>participation (20%), weekly<br>exercises and assignments<br>(30%), examinations (50%).  | Essential Cell<br>Biology D, Lewis J,<br>Raff M, Walte<br>P, Hopkin K,<br>Johnson A,<br>Roberts K | ay Garland<br>Science                      |  | OpenStax,<br>Biology OpenStax CNX.   |   | Students are expected to spend<br>1-2 hours per week, on<br>average, reading relevant<br>textbook material and<br>completing assignments.  | <ul> <li>I)This is a general, entry-level course that is open to all students and is compulsory for first-year FGL students in the AMB program. Although not essential, it is best taken together with Biology B (Essential Biochemistry) to provide an overall view of cellular components and their functions. High school-level familiarity with basic organic chemistry and biology is assumed. Japanese students and exchange students from any field of study are encouraged to enroll, knowing that this is an introductory course which is held in English.□</li> <li>2)Alberts' Essential Cell Biology (4th Edition) is the main reference textbook.□</li> <li>3)Instructor available for questions and consultation upon appointment and during office hours, Thursdays 10:00-12:00 e-mail (mrobert@m.tohoku.ac.jp).</li> </ul> |
| CB23246 Linear Algebra A Fal               | I,<br>e/3rd   | Expansion Subjects-<br>Mathematics     | 2 AMC, TRUSHIN, Igor 2<br>IMAC-U (Institute for Excellence in<br>Higher Education)              | E   | Fundament<br>s of linear<br>algebra         | al The purpose of this class is to learn the basic notions and properties of vectors and matrices   | One should understand and master methods of dealing with matrices and determinants   | 1.Properties of real vectors         2.Linear independence and basis         3.Rank of a matrix, sweeping out method         4-5.Addition, scalar and matrix multiplications         6.Regular matrix and basis         7.Determinants         8-9.Fundamental properties of determinants         10-11.Calculation of determinants         12.Cofactor expansion of a matrix         13.Inverse of a matrix         14.Cramer's rule         15.Final examination  | Evaluation will be based on<br>results of a tests and home<br>work   | Introduction to<br>Linear Algebra   | Springer.                                  |  |  |   | Homeworks  |   |
| CB24209 Physics A Fal<br>Tur<br>I          | I,<br>e/4th   | Expansion Subjects-<br>Physics         | 2 FGL Takeshi KOIKE<br>小池 武志<br>Institute for Excellence in<br>Higher Education 4               | E   | Introductory<br>Physics                     | This course is intended for students without any or little<br>backgorund in physics and calculus. Through Newtoniau<br>mechanincs, improtant concepts in physics such as<br>force, momentum, energy, angular momentum, and law<br>of conservation will be introduced. In addition, how these<br>concepts are described in the language of mathematica<br>equations, in particular, using calculus will be explored.                                     | By the end of the course, you are expected to gain familiarity with Newton's laws of motion, momentum,<br>and energy, and angular momentum as well as their conservation properties. In addition, you are expected<br>to be able to draw a free-body diagram, derive an equation of motion, and solve it using simple vector<br>gates and calculus.  | Schedule of the course:         d       O. Orientation to WileyPlus + ORION system and the course survey         1. Introduction and Ch1: Measurement (unit)         2. Ch2. Motion Along a straight line ( acceleration and free fall)         3. Ch3. Vectors         4. Ch4: Motion in Two and Three Dimensions (Projectile motion under uniform gravity)         5. Ch4. Motion in Two and Three Dimensions (Uniform circular motion, and relative motion)         6. Ch5: Force and Motion I ( Newton's law of motion)         7. Ch5 and Ch6: Force and Motion I & II (free body diagram, frictional force, and centripetal force)         Midterm examination (Ch1-Ch6)         8. Ch7: Kinetic Energy (transformation and transfer of energy, work, work done by gravity, work done by spring, and power)         9. Ch7: Kinetic Energy (transformation and transfer of energy, work, work done by gravity, work done by spring, and power)         10. Ch8: Potential Energy (isolated system, conservation of energy, conservative force and potential energy)         11. Ch9: Center of Mass (a system of particles, center of mass, conservation of total momentum of a system)         12. Ch10: Rotation (Lecture 7-10) | Evaluation will be based on a<br>midterm exam (25%), final<br>exam (25%), homework<br>assignments (20%),<br>attendance (10 %), reading<br>assignemnt and self-practice<br>with ORION system (20%). | Fundamentals<br>of Physics<br>Extended, 10th<br>Edition<br>Walker                                 | y, Wiley 2013                              |  | textbook   | https://weyplus.o   | ww.wil This course requires purchase<br>of the WileyPlus system which<br>costs \$40 USD. The system<br>includes an electronic version<br>of the required textbook with<br>many integrated features to<br>facilitate understanding of the<br>subjects and problem solving<br>skill in physics. The system<br>also comes with a self-<br>diagnostic tool, ORION, with<br>which one will practice problem<br>solving based on his/her own<br>proficiency in each chapter that<br>will be covered in the course.<br>Access to internet is necessary<br>outside of the class.<br>Registration to the WileyPlus<br>and payment method will be<br>announced in the orientation in<br>the first lecture. | If you are planning to take Physics B or/and<br>C, you must register for another Physics A<br>(ZDN-PHY111E), which is targeted for<br>chemistry and engineering majors with<br>highschool-level physics and calclus<br>background. Survey of conceptual<br>understanding of the subject will be<br>conducted at the first and last lecture to<br>assess the effectiveness of the<br>instructional method.□<br>For contact mailto:<br>takeshi.koike.b6@tohoku.ac.jp  |
| CB52227 Calculus A Fal<br>Fri              | l,<br>/2nd    | Expansion Subjects-<br>Mathematics     | 2 FGL TRUSHIN, Igor 2<br>(Institute for Excellence in<br>Higher Education)                      | E   | Calculus of<br>functions of<br>one variable | The purpose of this class is to learn the basic notions of derivative and integral  | f One should understand fundamental definitions and theorems of calculus, master the basic techniques an applications which accompany them.  | nd       1.Properties of real numbers         2.Limits of sequences and functions         3.Basic elementary functions, trigonometric functions, inverse functions         4.Continuous functions         5.The definition of derivative         6.The mean value theorem         7.L'Hospital's rule         8.Higher order derivatives         9.Taylor formula and Taylor series         10.Applications of derivatives, minimum and maximum values.         11.Indefinite integrals, computing basic indefinite integrals         12.Riemann integral and its properties         13.Improper integrals         14.Applications of integration         15.Final examination  | Evaluation will be based on<br>results of a tests and home<br>work   | Calculus: An<br>intuitive and<br>Physical<br>Approach<br>(Second<br>Edition).                     | Dover<br>Publication<br>s                  |  |  |   | Homeworks  |   |
| CB53221 Foundations of Fal<br>Calculus Fri | l,<br>/3rd    | Expansion Subjects-<br>Mathematics     | 2 AMB HANSEN, Frank 2<br>(Institute for Excellence in<br>Higher Education)                      | E   | Foundation<br>of Calculus                   | <ul> <li>1. Academic Aims: An elementary introduction to calculus for functions of one or two variables.</li> <li>2. Keywords: Continuity, derivative, integral, convex function, extreme value problems for functions of one or two variables, double integral.</li> </ul>   | The student will learn the notions of limit, continuity and differentiability, master differentiation, integration<br>and extreme value problems for functions of one or two variables.  | 第1回 Sets and functions, infimum and supremum, sequence and convergence, proof by induction.         第2回 Continuity and differentiability, calculating with derivatives.         第3回 The extreme value theorem, the mean value theorem, De L'Hospital's rule.         第4回 Area and integration.         第5回 The logarithm, the exponential function, and the trigonometric functions.         第6回 Exercises on the blackboard.         第7回 Higher order derivatives. Taylor's and MacLaurin's theorems.         第8回 Convex functions of one variable. Extreme value problems.         第9回 The indefinite integral of rational functions.         第110回 One hour mid-term test, exercises.         第112回 Extreme value problems for functions of two variables.         第120 Extreme value problems for functions of two variables.         第130 Double integrals and polar coordinates         第140 Summary of the course and exercises.         第150 Examination.   | Evaluation: By class<br>participation and by the result<br>of the examination.   | Calculus: An<br>intuitive and<br>Physical<br>Approach<br>2.ed.                                    | Dover<br>Publication<br>s                  |  |  | sites.go<br>m/site/f<br>nsentoh<br>bloc   | ogle.co<br>homework: The students are<br>required to solve excersises for<br>oku.we<br>each lecture.   | The lecturer prepares presentation files for<br>each lecture and post them on the<br>homepage for the course.   |

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|--|--|---|---|--|--|---|--|---|--|--|--|-------------------------------------|---|---|--|--|---|
| CB54209 Physics A Fall, Fri/4th  | h Expansion Subjects-<br>Physics 2                                     | FGL Takeshi KOIKE<br>小池 武志<br>Institute for Excellence in<br>Higher Education   | 2 E   | Classical<br>Mechanics   | This is an introductory course to Newtonian mechanics.<br>By the end of the course, you are expected to gain familiarity with and obtain basic understandings of<br>Newton's laws, work and energy, conservation of energy, linear momentum, and angular momentum,<br>physics B (oscillations and waves, fluid dynamics) and<br>Physics C (electromagnetism). Mechanics deals with this<br>course is applicable to an object or system of particles<br>that is slow moving in comparison to the speed of light<br>(non relativistic) and large enough in physical scale as to<br>be unaffected by quantum fluctuations, hence the name<br>"classical".   | Schedule of the course:<br>0. Orientation to WileyPlus + ORION system and the course survey<br>1. Ch3: Vectors (General introduction to physics, scalar vs vector, addition, dot and cross product, unit vector, and vector and calculus)<br>2. Ch4: Motion in Two and Three Dimensions (Projectile motion under uniform gravity, uniform circular motion, and relative motion)<br>3. Ch5: Force and Motion I( Newton's law of motion, its applicability, Galilean relativity, inertial frame, force and rate of change of linear momentum, and conservation of momentum)<br>4. Ch6: Force and Motion II (free body diagram, frictional force, drag force (viscous and inertial), and centripetal force)<br>5. Ch7: Kinetic Energy (transformation and transfer of energy, work, work done by gravity, work done by spring, and power)<br>6. Ch8: Potential Energy (isolated system, conservation of energy, conservative force and potential energy)<br>7. Ch9: Center of Mass (a system of particles, center of mass, conservation of total momentum of a system, and reduced mass of two body system)<br>8. Ch9: Collision (impulse, elastic and inelastic collision, and rocket equation)<br>9. Ch10: Rotation (coresspondance between linear and angular motion, moment of inertia, parallel and orthogonal axis theorem, center of mass frame, rolling on an inclined plane)<br>10. Ch11: Rolling, Torque, and Angular Momentum (rigid body, torque as a rate of change of angular momentum, torque in the center of mass frame, rolling on an inclined plane)<br>11. Ch11 (rolling on a flat surface, physics of tops, precession, and gyroscopic effect)<br>12. Ch13: Gravitation (gravity near the earth surface, gravitational potential) and Course survey<br>Final examination (Lecture 7-13) | Evaluation will be based on a<br>midterm exam (30%), final<br>exam (30%), homework<br>assignments (20%), reading<br>assignment and self-practice<br>with ORION system (20%).   | Fundamenta<br>of Physics<br>Extended, 10<br>Edition | als David Hallida<br>Robert<br>Oth Resnick, Jean<br>Walker | y, Wiley 2013                          |  | ook                                 |   |   | https://www.w<br>eyplus.com/                                   | I This course requires purchase<br>of the WileyPlus system which<br>costs \$40 USD. The system<br>includes an electronic version<br>of the required textbook with<br>many integrated features to<br>facilitate understanding of the<br>subjects and problem solving<br>skill in physics. The system<br>also comes with a self-<br>diagnostic tool, ORION, with<br>which one will practice problem<br>solving based on his/her own<br>proficiency in each chapter tha<br>will be covered in the course.<br>Access to internet is necessary<br>outside of the class.<br>Registration to the WileyPlus<br>and payment method will be<br>announced in the orientation in<br>the first lecture. | For those planning to take Physics B or/and<br>C, the WileyPlus account that is purchased<br>in this course will be reserved, and no<br>additional payment is necessary. Survey of<br>conceptual understanding of the subject<br>will be conducted at the first and last<br>lecture to assess effectiveness of the<br>instructional method.□<br>For contact mailto:<br>takeshi.koike.b6@tohoku.ac.jp  |
| CB11203 An Introduction to<br>Information<br>Science B                     | Common Subjects<br>Information Sciences 2                              | FGL         Shuji ISOBE, Eisuke KOIZUMI<br>磯辺 秀司、小泉 英介<br>(Center for Information<br>Technology in Education)                                     | 2 E   | Information<br>basics B  | An introductory course to acquire the university-level academic skills through information science and technology. Successful course participants will learn to utilize the information technology for intellectual and productive activities.   | ive       1. Orientation         2. Basics usage of information systems         3. Academic skill I (Basics of intellectual production assisted by information technology, part 1)         4. Academic skill I (Basics of intellectual production assisted by information technology, part 2)         5. Academic skill I (Basics of intellectual production assisted by information technology, part 3)         6. Academic skill I (Basics of intellectual production assisted by information technology, part 3)         7. Academic skill I (Computational thinking, part 1)         8. Academic skill II (Computational thinking, part 2)         9. Academic skill II (Computational thinking, part 3)         10. Academic skill II (Computational thinking, part 4)         11. Academic skill II (Computational thinking, part 5)         12. Academic skill II (Computational thinking, part 6)         13. Academic skill II (Computational thinking, part 7)         14. Academic skill II (Computational thinking, part 8)         15. Academic skill II (Computational thinking, part 9)         16. Academic skill II (Computational thinking, part 10)  | Homework assignments (1 or<br>times): 80-100%<br>Participation in class: at most<br>20%  | 2   |  |  |  |                                     |   |   |  | Students are required to subminion homework assignments.   | t Course materials will be distributed with a web-based information service called ISTU. □<br>Details about the service will be instructed in the course.   |
| CB12240 Mineralogy,<br>Petrology & Mon/2nd<br>Geochemistry                 | Expansion Subjects-<br>Natural Sciences/<br>Earth and Space<br>Science | FGL       ZHANPEISOV, Nurbosyn<br>(Institute for Excellence in<br>Higher Education)   | 2 E   | Fundamenta<br>s of crystal<br>structures of<br>solids  | The chemical crystallography applied to different kinds<br>of solid structures is an important fundamental concept<br>in many fields of chemistry and physics. One will learn<br>the diversity of oxide, salt, metallic as well as organic<br>solids, the nature and types of ordered structures<br>composed of identical repeating units of a group or large<br>atoms, molecules, ions as well as basic principles of<br>defining crystal structures by physical and theoretical<br>methods.  | <ul> <li>1. Introduction to the chemistry and physics of solids, mineralogy <ol> <li>Amorphous solid, glass and polymer (biopolymer)</li> <li>Chemical bonding in solids, coordination number</li> <li>Cohesive energies in solids, formation energy of a unit</li> <li>Interatomic distances in crystal structures</li> <li>Basic structure motifs of crystalline solids</li> <li>7. Anisotropy and the Avogadro constant</li> <li>Examples of crystal structures</li> <li>9. Magnesium oxide, low coordination ions</li> <li>10. Silica and zeolites</li> <li>11. Titanium dioxides (rutile, anatase, brookite)</li> <li>12. Covalent crystals of carbon</li> <li>13. Metals</li> <li>14. Metal-organic frameworks</li> <li>15. Term-end test</li> </ol> </li> </ul>  | Evaluation will be based on<br>class attendance, reports and<br>on the results of term-end test  | Physical<br>Chemistry                               | R.J. Silbey<br>and R.A.<br>Alberty                         | 2000                                   |  |                                     |   |   |  | We will have small and term-<br>end tests. The lecture<br>attendance will be strictly<br>controlled.   |   |
| CB13211 Foundations of<br>Linear Algebra Mon/3rd                           | Expansion Subjects-<br>Mathematics 2                                   | FGL       HANSEN, Frank<br>(Institute for Excellence in<br>Higher Education)  | 2 E   | Foundations<br>of linear<br>algebra  | 1. Academic aims: An elementary introduction to linear algebra.□       The student will learn fundamental notions of elementary linear algebra, master the sweeping-out (echelo method to solve systems of linear equations, invert matrices, calculate determinants and eigenspaces, ar equations, determinants, eigenvalues, diagonalization, quadratic forms.   | <ul> <li>Ion) 第1回 Vectors in the two-dimensional plane, vector calculus, the dot product, Cauchy-Schwartz inequality, orthogonal vectors, the angle between two vectors. □</li> <li>第2回 Vectors in the n-dimensional space, vector calculus, the dot product, Cauchy-Schwartz inequality, orthogonal vectors, the angle between two vectors, lines and hyper planes. □</li> <li>第3回 Matrix addition and scalar multiplication, matrix multiplication, regular matrix, transposed matrix. □</li> <li>第4回 Systems of linear equations, linear equations on matrix form, row operations, echelon form of linear equations. □</li> <li>第5回 Operation matrices, inversion of matrices. □</li> <li>第6回 Exercises on the blackboard. □</li> <li>第7回 Determinants. □</li> <li>第8回 Calculating determinants. □</li> <li>第9回 Eigenvalue and eigenvector. Calculating eigenspaces. □</li> <li>第10回 One hour mid-term test, exercises. □</li> <li>第12回 Quadratic forms. □</li> <li>第13回 Applications in calculus. Interpolation and convex functions of two variables. □</li> <li>第14回 Summary of the course and exercises. □</li> <li>第15回 Examination</li> </ul>  | Evaluation: By class<br>participation and by the result<br>of the examination.   | Introduction<br>Linear Algeb                        | to<br>ora  | Springer<br>Verlag                     |  |                                     |   |   | sites.google.c<br>m/site/frankha<br>nsentohoku.w<br>bloc       | o Homework: The students are<br>required to solve excersises fo<br>e each lecture.   | The lecturer prepares presentation files for<br>each lecture and post them on the<br>homepage for the course.   |
| CB14233 Life and Nature Fall,<br>Mon/4th                                   | Core Subjects-Science 2<br>Studies                                     | FGL       ROBERT, Martin<br>(Institute for Excellence in<br>Higher Education)   | 2 E   | Big History:<br>The<br>organization<br>and evolution<br>of the<br>universe<br>(from the Big<br>Bang to now | This course aims to provide an overview of the natural processes that courred over 13.7 billion years and etco the word that survands us. An important ambition is to help students in various liets appreciate the more finance, interdependence and connections between physical, and special sciences. The course will provide be the volument students in various liets appreciate the transformation is to help students in various liets appreciate the transformation. The will complexely the thirtiest concentration between physical, and special sciences. The course will provide be there   | ents Course subjects and content:<br>2x 1)Introduction: What is Big History?<br>3)Stars light up. New chemical elements<br>4)Our solar system and earth<br>5)Life (1): What is Life?<br>6)Life (2): The origin of life. Common ancestry and diversity<br>7)Life (3): The Biosphere, energy, and biogeochemical cycles<br>8)Life (4): Biodiversity and ecosystems<br>9)Life (5): Evolution and natural selection<br>10)Early humans and collective learning<br>11)Agriculture and civilization<br>12)Expansion and interconnection<br>13)Acceleration<br>14)Cher Future<br>15)Einal examination<br>ess   | Evaluation will be based on<br>weekly attendance and active<br>participation (10%), completio<br>of in-class activities, exercises<br>and assignments (30%), a<br>team project (20%) as well as<br>mid-term and final examination<br>(40%).  | Big History<br>Project web<br>site                  |  |  |  | Cosmic<br>evolution.                | Eric J.<br>Chaisson                     | 2013  | https://school<br>ighistoryproje<br>.com/bhplive               | b Students will be expected to<br>spend 1-2 hours per week, on<br>average, reviewing video and<br>written documents and doing<br>assignments.  | 1)This is a general, entry-level course<br>that is open to all students, regardless of<br>their study program and background. It is a<br>required course for all first-year FGL<br>program students. Japanese students and<br>exchange students from any field of study<br>are encouraged to enroll, knowing that this<br>is an introductory course that is held<br>completely in English. There will be many<br>opportunities to listen, read, write and<br>discuss in English in small groups.□<br>2)Instructor available for questions and<br>consultation upon appointment and during<br>office hours, Thursdays 10:00-12:00<br>(mrobert@m.tohoku.ac.jp). |
| CB15201 Basic Japanese 1 Fall,<br>Mon/5th<br>Tue/5th<br>Thu/5th<br>Fri/5th | Common Subjects-<br>Subjects for<br>International Students             | FGL       Natue SUGAYA,<br>Kei YOSHIMOTO<br>菅谷 奈津恵,<br>吉本 啓<br>(Institute for Excellence in<br>Higher Education)         Atsuko UCHIYAMA<br>内山 敦子 | 2 E   | Japanese fo<br>beginners   | Intended for students who will study Japanese for the<br>first time. This class aims to help students acquire basic<br>knowledge of Japanese language and enhance the four<br>skills of speaking, listening, reading, and writing.<br>Students will<br>skills of speaking, listening, reading, and writing.<br>Students will<br>skills of speaking, listening, reading, and writing.<br>Students will<br>skills of speaking, listening, reading and writing for essential everyday situations<br>skills of speaking, listening, reading, and writing.<br>Students will<br>skills of speaking, listening, reading, and writing.<br>Students will<br>skills of speaking, listening, reading and writing for essential everyday situations<br>skills of speaking, listening, reading, and writing for essential everyday situations<br>skills of speaking, listening, reading, and writing for essential everyday situations<br>skills of speaking, listening, reading, and writing for essential everyday situations<br>skills of speaking, listening, reading, and writing for essential everyday situations<br>skills of speaking, listening, reading, and writing for essential everyday situations<br>skills of speaking, listening, reading, and writing for essential everyday situations<br>skills of speaking, listening, reading, and writing for essential everyday situations<br>skills of speaking, listening, reading, and writing for essential everyday situations<br>skills of speaking, listening, reading, and writing for essential everyday situations<br>skills of speaking, listening, reading, and writing for essential everyday situations<br>skills of speaking, listening, reading, and writing, skills in speaking, listening, reading, and writing for essential everyday situations<br>skills of speaking, listening, reading, and writing, skills in speaking, listening, reading, and skills in | 1. Course orientation, Kana quiz         2-5. Lesson 1 X wa Y desu construction, Question sentences         6-9. Lesson 2 Demonstrative (ko/so/a)         10-13. Lesson 3 Verb types and the present tense         14-18. Lesson 4 Describing where things are, Past tense of verbs         19-23. Lesson 5 Adjectives, Counting         24-28. Lesson 6 Te-form, Describing two activities         29. Midterm exam (Katakana, Kanji, Grammar, Listening)         30. Midterm exam (Speaking)         31-34. Lesson 7 Various meanings of te iru form         35-39. Lesson 8 Short forms (plain forms)         40-44. Lesson 9 Past tense short forms         45-49. Lesson 10 Comparison between two items         50-54. Lesson 11 Describing hope or aspiration (-tai)         55-58. Lesson 12 Explaining things (-n desu)         59-60 Summary  | <ol> <li>Exams(Midterm exam:<br/>Katakana, Kanji, Grammar,<br/>Listening, Speaking; Final<br/>exam (Katakana, Kanji,<br/>Grammar, Listening, Writing,<br/>Speaking) 60%, □</li> <li>Quizzes (Kana, Kanji,<br/>vocabulary,grammar) 20%, □</li> <li>Homework 10% □</li> <li>Class participation 10%</li> </ol> | Genki 1,<br>second editio                           | on Banno et al.  | The Japan 2011<br>Times                | 978-4-<br>7890-<br>1440-3                                      | pook Genki 1<br>Workboo<br>second e | edition Banno et The Japan<br>al. Times | n 2011 978-4-<br>7890-<br>1441-0  | k Genki-Online<br>http://genki.ja<br>antimes.co.jp.<br>ndex_en | <ul> <li>(1)Those who have no knowledge of the Japanese i characters (hiragana, katakana should learn hiragana and katakana as a prerequisite to joining the program by using prescribed materials.□</li> <li>(2) During the course we experised you to: □</li> <li>1. Submit all homework assignments by due dates. Lat work will be marked lower. □</li> <li>2. Prepare for the lessons: Listen CD and learn vocabulary in advance. Read the grammar explanations in advance.</li> </ul>   |   |

|                                      |  |                      |  | Langu                            | lag   |  |  |  |  |                                    |                          | Taxtback   |   | Toythook   |   |   |
|--------------------------------------|--|----------------------|--|----------------------------------|---|--|--|--|--|------------------------------------|--------------------------|--|---|--|---|---|
| Code Subject                         | Day/Perio<br>d<br>Categories   | Credit(<br>s) Object | Instructor (Position)  | ster E:Eng<br>J:Japa<br>ster ase | se Class<br>lis Subject<br>an   | Object and Summary of Class  | Goal of Study  | Contents and Progress Schedule of the Class  | Evaluation Method  | Textbook 1 -<br>Textbook<br>Title  | 1 - 1 -<br>Publishe<br>r | Textbook<br>1 -<br>Publicati<br>on<br>YearTextbook<br>Textbook<br>1-<br>1-<br>N<br>N<br>N<br>Referenc<br>eTextbook<br>Textbook<br>Textbook<br>Textbook<br>Textbook<br>Textbook<br>Textbook<br>Textbook<br>Textbook<br>Textbook<br>Textbook<br>Textbook<br>Textbook<br>Textbook<br>Textbook<br>Textbook<br>Textbook<br>Textbook<br>Textbook<br>Textbook<br>Textbook<br>Textbook<br> | 2 - Textbook<br>k 2 -<br>Aurthur                          | TextbookTextbookTextbook2 -2 -Textbook2 -PublisheOn1SBN/ISS/rYearNReference111 | URL Preparation and Review  | In Addition   |
| CB31228 History and<br>Human Society | Fall,<br>Wed/1st Studies   | 2 FGL                | Manabu NAKAGAWA<br>中川 学<br>(Institute for Excellence in<br>Higher Education) | 2 E                              | History of<br>Tohoku<br>University  | What sort of a university is Tohoku University?<br>This course aims to help students understand the characteristics and uniqueness of Tohoku University from a historical perspective.   | The goal is for each of you to acquire the following knowledge and abilities through these lectures. □<br>(1) To be able to understand and explain Tohoku University's history by using some concrete example. □<br>(2) To be able to survey and describe the features of your university, department and laboratory from a<br>historical point of view.   | This course is centered on a lecture and a field trip.<br>The contents and schedule are as shown below:<br>(1) Introduction<br>(2) Field trip (Sendai City Museum)<br>(3) The Foundation of Tohoku Imperial University<br>(4) Field trip (University Museum)<br>(5) Open Door Policy<br>(6) Development of University I<br>(7) Development of University II<br>(8) Student Life<br>(9) Field trip (University Library)<br>(10) International Students<br>(11) World War II and Postwar Reforms<br>(12) Field trip (University Archives)<br>(13) University Campus<br>(14) University Reforms<br>(15) University Ideals   | <ul> <li>Half of your grade will be based<br/>on attendance and<br/>understanding of the course<br/>(Minute Paper*, 50%), while the<br/>other half will be based on a<br/>final paper (50%). □</li> <li>*Students will be requested to<br/>complete the Minute Paper at<br/>the end of the class.□</li> <li>A student absent more than 5<br/>sessions will not be given any<br/>credit.</li> </ul> |                                    |                          |  |   |  | Students will be requested to write a paper after each field trip.□       The this Students will be requested to of fie write a final paper at the end of than lotte Offic         We could be advanted by the semester.       Offic We could be be advanted by the semester. | must attend the first class session.<br>maximum number of participants for<br>course is 40 due to the circumstances<br>eld trip. If there are more applicants<br>quota, participants will be selected by<br>ry.<br>e hours are from 13:00 to 16:00 on<br>lnesday. Make an appointment in<br>ance via e-mail or other means.<br>ail: manabun@m.tohoku.ac.jp. |
| CB32247 Chemistry A                  | Fall, Expansion Subjects-<br>Wed/2nd Chemistry   | 2 FGL                | ZHANPEISOV, Nurbosyn<br>(Institute for Excellence in<br>Higher Education)    | 2 E                              | Fundamenta<br>s of chemica<br>bond theory                                 | al The nature of chemical bond is the fundamental concept<br>to understand the structure and properties of atoms and<br>molecules as well as any molecular substances. One<br>will learn the electronic structure of atoms depending on<br>its position in periodic table of elements, formation of<br>bonds as well as different molecular associations based<br>on quantum chemistry concepts.   | t One must understand the structure of the atom based on its electronic configuration as well as its relationship with chemical and physical properties of any element. One will learn the concept of wave equation, its application to diatomic molecules and chemical bonds in large molecular associations. Shape or structure of simple polyatomic molecule can be explained via concept on hybridization or hybrid molecular orbital formations as well as relationships between bond length and electronic configuration. One must understand the nature of bonding responsible for stability of molecular associations.   | 1. Introduction         2. Classical quantum theory and atomic model         3. Wave equation and basics of quantum chemistry         4. The particle in a one-dimensional box         5. Electronic configuration and periodic table of elements         6. Covalent bond and ionic bond         7. Electronic structure of positively charged molecular hydrogen and diatomics         8. Mid-term test         9. Hybrid molecular orbital and the shape of the polyatomic molecule         10. Crystal structure motif and crystal field theory         11. Approximation methods, Valence-bond (VB) method         12. Hückel theory for ethylene, allyl         13. Hückel theory for butadiene and trimethylenemethane         14. Modern quantum chemistry         15. Term-end test   | Evaluation will be based on<br>class attendance, reports and<br>on the results of term-end test.   | Physical<br>Chemistry              | 3                        | 2008<br>Physical<br>Chemistry: /<br>Molecular<br>Approach  | D.A.<br>McQuarrie<br>and J.D.<br>Simon                    |  | We will have small quizzes and<br>term-end tests. The lecture<br>attendance will be strictly<br>controlled.   |   |
| CB42224 World of Fine Art            | s Fall, Core Subjects-Human<br>Thu/2nd Studies   | 2 FGL                | Mitsuru HAGA<br>芳賀 満<br>(Institute for Excellence in<br>Higher Education)    | 2 E                              | Japanese Ar<br>History  | Art shows (and encompasses) the way we comprehend<br>and understand this Universe. Therefore Art should be<br>regarded as a visual philosophy; not as a mere<br>illustration of history based on written documents.<br>Thereupon, the importance of learning its history, in this<br>case, Japanese Art History, can never be exaggerated.   | The objective of this course is to provide an outline and basic knowledge about Japanese Art History<br>ranging from the beginnings of human habitation in the Japanese archipelago to the present, including the<br>art of the Jomon, Yayoi, Kofun, Asuka and Nara, Heian, Kamakura, Muromachi, Azuchi-Momoyama, Edo,<br>Meiji, Taisho, Showa and Heisei Periods.   | <ol> <li>Course Orientation. What is Art ?</li> <li>Art of Jomon Period</li> <li>Art of Yayoi and Kofun Periods</li> <li>Asuka Hakuou Art~ the Reception of Buddhism</li> <li>Art of Nara Period</li> <li>Ar of Heian Period 1</li> <li>Art of Heian Period 2</li> <li>Art of Kamakura Period</li> <li>Art of Kamakura Period</li> <li>Art of Nanbokucho/Muromachi Period</li> <li>Art of Momoyama Period</li> <li>Art of Edo Period 1</li> <li>Art of Edo Period 2</li> <li>Art of Meiji Period</li> <li>Art of Taisho, Showa and Heisei Periods (2)</li> </ol>   | Evaluation will be based on<br>final report (70%), performance<br>in the class room (30%).   | A History of<br>Japanese Art TSUDA | Tuttle<br>Publishing     | 2009 978480531<br>0311   |   |  | The session time is limited and<br>therefore self-directed learning<br>is important. Students are<br>required to prepare and review<br>for each class.  |   |
| CB43230 Chemistry B                  | Fall, Expansion Subjects-<br>Thu/3rd Chemistry   | 2 FGL                | ZHANPEISOV, Nurbosyn<br>(Institute for Excellence in<br>Higher Education)    | 2 E                              | Fundamenta<br>s of physical<br>chemistry                                  | Al In this course, main emphasize will be given to the<br>fundamentals and concepts that provide a basis for<br>understanding physical chemistry, underline physical<br>principles that govern the properties and behavior of<br>chemical systems. It would be also as a learning basic<br>course by giving a series of lectures on different topics<br>of physical chemistry.   | One must understand the fundamental relationships between the structure of a chemical compound and its physical (as well as chemical) properties. One must understand main concepts of state equations, main laws of thermodynamics, reaction equilibrium as well as reaction kinetics.  | <ul> <li>I. Quantitative concepts of temperature, work, internal energy and heat</li> <li>2. Classical mechanics and Newton's second law of motion</li> <li>3. First law of thermodynamics</li> <li>4. Barometric formula, van der Waals equation, enthalpy and heat capacity</li> <li>5. Carnot heat engine, the second law of thermodynamics</li> <li>6. Entropy, the third law of thermodynamics, thermodynamic equations of state</li> <li>7. Kinetic theory of gases, model of a perfect gas</li> <li>8. Types of average speeds, collision with a surface</li> <li>9. Mid-term test</li> <li>10. Reaction kinetics and reaction rate equation</li> <li>11. First, second and third order reactions</li> <li>12. Reversible first order reaction, parallel first order reactions</li> <li>14. Radical reactions, unbranched and branched chain reactions</li> <li>15. Term-end test</li> </ul>  | Students must attend all these<br>lectures. Evaluation will be<br>based on class attendance, on<br>the results of short and term-<br>end tests, home works and<br>reports.   | Physical<br>Chemistry              | 3                        | 2008 Physical<br>Chemistry   | R.J.<br>Silbey,<br>R.A.<br>Alberty and<br>M.G.<br>Bawendi |  | We will have small and term-<br>end tests. The lecture<br>attendance will be strictly<br>controlled.  |   |
| CB44214 Health                       | Fall, Common Subjects-<br>Thu/4th Health Sciences  | 2 FGL                | Ryoichi NAGATOMI<br>永富 良一<br>(Graduate School of<br>Biomedical Engineering)  | 2 E                              | Health<br>Science   | Threats to health has long been determined by how well<br>you are fed, and how well you could stay away from<br>contagious bacteria and viruses. Yet, in the world wher<br>we know how successful aging would be accomplished<br>threats to health depend rather on your every day<br>behavior, your life style. Moreover, thanks to the<br>developed way of transportation of today's world, many<br>people should confront with viruses we've never<br>encountered. In this class we will discuss about the<br>latest health care tips and topics with scientific<br>background. We will make full use of multinational<br>class, comparing the health care system in different<br>countries and health tips with different cultural<br>background.  | The aim of the class is to encourage students to understand and interpret flooding amount of health care information based on scientific way of thinking.  | The topics will vary and may be picked up upon discussion in the class. The topics covered in the previous classes were:-□         1. Welcome to the G30 Health Science class: a guide to the class.□         2. How health care systems work 1.□         3. How health care systems work 2.□         4. What are risk factors? □         5. Obesity.□         6. Exercise, physical activity and health.□         7. Food and health.□         8. Aging.□         9. Memory and cognition.□         10. Genes and health.□         11. Common cold and flu.□         12. Physical training; how it works.□         13. Sports injury 1.□         14. Sports injury 2.□         15. Drug abuse and drug allergy.   | Participation is essential. I<br>appreciate an active<br>involvement in the<br>discussion.Instead of an overal<br>exam, Evaluation will therefore<br>be based on participation and<br>brief E-mail based reports<br>about the discussion in the<br>class with their own opinion on<br>the topic after the classes.   |                                    |                          |  |   |  | I will occasionally organize<br>group works, in which each<br>group needs to search for<br>information on a certain topic<br>and report in the next class.  |   |
| CB23263 Sports A                     | Fall,<br>Tue/3rd Common Subjects-<br>Health Sciences   | 1 AMB                | Akira TAMAGAWA<br>玉川 明朗<br>(Graduate School of<br>Medicine)                  | 2 J                              | Badminton   | In this class, students will learn the importance of<br>physical activity and how to exercise appropriately<br>through badminton, a recreational sport with which man<br>students are already familiar. Also, by playing<br>competitively they will experience the importance of<br>expressing intent and relating to and communicating<br>with others. This will foster their initiative and<br>cooperativeness. The class will be conducted so that<br>anyone can take it, regardless of their level of physical<br>fitness or badminton ability. By hitting the shuttlecock<br>back and forth with various partners, I hope that student<br>will learn not only the technical abilities needed to enjoy<br>rallying, but also social skills. The class aims to teach<br>students to enjoy sports activities, and feel confident<br>about engaging in sports in their everyday lives.<br>Badminton uses a shuttlecock. The word "shuttle"<br>means "to come and go." The player hits the<br>shuttlecock, which their partner then returns, so the<br>player then must hit it back to the partner again. This is<br>essentially a form of communication. Both beginners<br>and experts are welcome in this class. | Students will come to enjoy exercising through actively participating in physical activities.<br>All students will learn to enjoy rallying and matches without fear of making mistakes.<br>Y Students will acquire enough skill to participate in doubles matches.<br>In this class, "learning to play" and "technique" do not refer only to skill at hitting the shuttlecock with the<br>racket. They also include playing badminton under various conditions while observing others, in addition to<br>the ability for self-observation. They will learn about "intangibles" that cannot be taught in classroom<br>lectures with the objective of obtaining "awareness" of the present moment. | 1st Class, guidance         2nd What kind of sport is badminton?         3rd Making contact between shuttlecock and racket         4th Misc. strokes pt. 1         5th Misc. strokes pt. 2         6th Misc. strokes pt. 3         7th Misc. strokes pt. 4         8th Misc. strokes pt. 5         9th Misc. strokes pt. 6         10th Basic skills for enjoying doubles games pt. 1         11th Basic skills for enjoying doubles games pt. 2         12th Basic skills for enjoying doubles games pt. 3         13th Basic skills for enjoying doubles games pt. 5         15th Concluding remarks and Trainings         From the 2nd class on, content will be arranged based on assessment of the students' skill level. Also, 1 v. 1 (singles and 2 v. 2 (doubles) practice will be conducted while learning stroke skills. Content of instruction may be changed depending on student proficiency. The pace of the class may also change depending on the speed at which the students progress.  | Needless to say, this class<br>largely assumes participation<br>as it is based on learning skills<br>and practicing. On the15th<br>class there will be a lecture. A<br>test may be given as well.<br>Basically, the class will be<br>graded as Pass - A (excellent)<br>or Fail - D (poor).   |                                    |                          |  |   |  |   |   |
| CB23264 Sports A                     | Fall,<br>Tue/3rd       Common Subjects-<br>Health Sciences         Image: I | 1 AMB                | Akira SATO<br>佐藤 明<br>(Graduate School of<br>Medicine)                       | 2 J                              | Kyudo<br>(Japanese<br>Archery –<br>Rules of<br>Shooting and<br>Etiquette) | As many of the students will be studying Kyudo for the<br>first time, they will learn the basics of handling the bow<br>and arrows, and drawing and releasing the bow.<br>Students will learn how the skills in Kyudo are based or<br>a deep understanding of the mechanics of the human<br>body and the characteristics of the equipment; in<br>addition to learning how to hit a target, they will gain a<br>rational and aesthetic understanding of the postures an<br>movements.   | Because Kyudo techniques and etiquette are very closely related, students will learn shooting techniques<br>and correct movements in formalized situations. Shooting techniques are comprised of a systematic set of<br>rules for handling the bow, while etiquette is composed of modes of traditional behavior. The goal of the<br>class is to enable students to gain a scientific understanding of the rational postures/movements, and to<br>learn to adapt their experiences into daily life.  | Although learning shooting skills is the first priority, etiquette will also be learned step by step in each class as it is fundamental to posture and movement. Students will experience the fun and difficulties of Kyudo through games and competitions.<br>1. Guidance: Hazard prevention and safety measures. Summary of technique and etiquette<br>2. Introduction: Basics of shooting. Basics of standing posture<br>3. Holding the bow and gripping the string / two kinds of sitting posture ("Kiza," "Seiza") / three-breath-bowing<br>4. Principles of positioning the limbs (lower and upper body) / two kinds of bowing in sitting position ("Shikkenrei,"<br>"Seshurei") / two-breath-bowing<br>5. Adjusting the body posture / the "Three Crosses" / two more kinds of bowing in sitting position ("Takushurei",<br>"Soshurei")<br>6. Setting the grip on the bow to control it correctly ("Tenouchi") / one more kind of bowing in sitting position<br>("Goshurei")<br>7. The leather archery glove ("Yugake") and its usage / walking in Kyudo<br>8. "The Five Crosses" and determining correct shooting form / the "Five Crosses" / "Suriashi" -walking<br>9. Drawing the bow / main points of "Uchiokoshi" and "Hikiwake" / synchronization of breathing and movements<br>10. Obtaining full draw length / drawing until "Yazuka" / various types of body turn<br>11. Arms and trunk forming a cross ("Tateyokojumonji," "Hanare no Jumonji") / turning the body while walking<br>12. Tips for reliably hitting the target (the four requirements in "Tsumeai") / moving forward and backward while<br>kneeling ("Shitka," "Shittai")<br>13. Important technical points about hitting or missing the target (vertical and horizontal "Nobia") / "Sonkyo"<br>14. The end of the shot (important aspects of "Zanshin") / synchronization of movements with breathing ("Ikiai")<br>15. Conclusion: Skill test - Hit 1m diameter target at a distance of 28m in the basic posture and movements | Students must attend class, as<br>learning the body movements<br>requires practice. Grades will<br>be based on attendance rate<br>and skill tests. Students will<br>take a practical examination,<br>shooting 79cm diameter target<br>at a distance of 28m, according<br>to the rules of formal technique<br>and etiquette.  |                                    |                          |  |   |  |   |   |

| Code        | Subject Day/Pe         | rio Categories                      | Credit(<br>s) Object | Instructor (Position)  | Langua<br>e Use<br>in<br>Seme Cours<br>ster E:Engl<br>h | ag<br>ed<br>se Class<br>lis Subject                                       | Object and Summary of Class   | Goal of Study  | Contents and Progress Schedule of the Class   | Evaluation Method   | Textbook 1 -<br>Textbook<br>Title | Took 1 -<br>thur P | extbook<br>1 -<br>ublishe<br>r Vear Textbook Textbook Textbook 1 -<br>1-<br>ISBN/ISS /<br>N Referenc Textbook 2 -<br>Textbook Textbook 1 -<br>Textbook 1 -<br>Textbook 1 -<br>Textbook 1 -<br>Textbook 1 -<br>Textbook 1 -<br>Textbook 1 - | Textbook<br>2 -<br>Aurthur | Textbook<br>2-<br>Publicati<br>r<br>N Referenc<br>Vear  |
|-------------|------------------------|-------------------------------------|----------------------|--|---|---|---|--|---|---|-----------------------------------|--------------------|--|----------------------------|---|
| CB23266 Spo | ts A Fall,<br>Tue/3rd  | Common Subjects-<br>Health Sciences | 1 AMB                | Ryoichi NAGATOMI<br>永富 良一<br>(Graduate School of<br>Biomedical Engineering)      | 2 J   | an<br>Soccer<br>(associated<br>football)                                  | Soccer is the most popular sports in the world. Soccer<br>has attracted many people because of its demand on<br>fitness and skills, tactical thinking, and communication<br>among the team members. Depending on one's<br>experience in playing soccer, technical skill may largely<br>differ, and one might feel inferior or alienated when they<br>have less experience. Once you find out your role in the<br>team, however, you will find a totally different world of<br>soccer, in which you find confidence and effectiveness in<br>the team. The sense of effectiveness and efficacy in the<br>team will not be accomplished alone, but sharing ideas<br>and roles among the team members is essential. The<br>role plays in this soccer class will definitely give you a<br>value! Why don't you enjoy playing soccer with us. | <ul> <li>understanding basic skills of soccer</li> <li>different ways of kicking a ball</li> <li>accuracy</li> <li>speed and power</li> <li>trick plays</li> <li>different ways of stopping a ball</li> <li>accuracy</li> <li>transition</li> <li>trick plays</li> <li>understanding basic concept of team plays in soccer</li> <li>ways to communicate among the team members</li> <li>passing and receiving</li> <li>positioning</li> <li>supporting</li> <li>understanding basic roles in soccer</li> <li>attacking</li> <li>defending</li> </ul> | <ul> <li>D1. Guidance</li> <li>In every class a 15-30-min skill up session for understanding basic skills in soccer will be provided. After the warm up and skill up sessions, league matches will be organized. A Man of the Match will be selected in each class. In case of bad weather like raining, indoor activity related soccer will be organized.</li> <li>D2. Skill check</li> <li>D3. Team assignment</li> <li>D4. Ball control: kicking</li> <li>D5. Ball control: shooting</li> <li>D7. The role of a goal keeper</li> <li>D8, Team tactics: passing and receiving, creating pass chances by changing the position</li> <li>D9. Team tactics: creating or depriving attacking spaces</li> <li>D10. Team tactics: team dynamics in defending and attacking with 2~3 players</li> <li>D11. Team tactics: various style of supporting</li> <li>D13. Advanced tactics: various style of defending</li> <li>D14. Advanced tactics: quick transition from defending to attacking (counter-attack)</li> <li>D15. Advanced tactics: taking advantages of the team members</li> <li>The order and the contents of classes may differ depending on the weather, the skills of the students and etc.</li> </ul>   | Participation is essential<br>(80%). Understanding the role<br>in a team of your own as well<br>as that of the teammates is<br>essential, and one's progress<br>will be evaluated (20%).  |                                   |                    |  |                            |   |
| CB23267 Spo | ts A Fall,<br>Tue/3rd  | Common Subjects-<br>Health Sciences | 1 AMB                | Toshihiko FUJIMOTO<br>藤本 敏彦<br>(Institute for Excellence in<br>Higher Education) | 2 J   | Softball  | The aim of "Sports A: Softball class is constructed of two<br>part. First part is "Team management" and Second part<br>is Coaching". Goal of first part is to lean the team<br>management that is how to relation with team member<br>using softball game. Goal of second part is to lean the<br>coaching that is how to make menu of practice and to<br>teach for member.  | The aim of "Sports A: Softball class is constructed of two part. First part is "Team management" and Second part is Coaching". Goal of first part is to lean the team management that is how to relation with team member using softball game. Goal of second part is to lean the coaching that is how to make menu of practice and to teach for member.   | <ul> <li>First part. Team management. Number of classes:1-8.</li> <li>1. Guidance.</li> <li>2. Decision of own objective and team formation.</li> <li>3. Softball practice and Communication with team mate.</li> <li>4. Softball practice and team production.</li> <li>5. Softball game and team condensation.</li> <li>6. Softball game and leadership.</li> <li>7. Softball game and norm within the team.</li> <li>8. Softball game, review and team management.</li> <li>Second part. Coaching. Number of classes: 9-15.</li> <li>9. Softball game and coaching theory 1: Assessment.</li> <li>10. Softball game and coaching theory 2: Feedback.</li> <li>11. Softball game and coaching theory 3: Teaching of softball practice.</li> <li>12. Softball game and coaching theory 5: Reflection.</li> <li>13. Softball game and coaching theory 6: Belief of teaching.</li> <li>15. Softball game and review.</li> </ul>  | Examination 50% and short<br>review report on every class<br>50%.<br>Grades of the course will be<br>assigned as follows:<br>AA······.Excellent (90-<br>100%)<br>A······.Good (80-89%)<br>B······.Fair (70-79%)<br>C······.Passing (60-<br>69%)<br>D·····.Failure (0-59%)   |                                   |                    |  |                            | Image: second |
| CB53247 Spo | ts A Fall,<br>Frii/3rd | Common Subjects-<br>Health Sciences | 1 AMC                | Haruki MOMMA<br>門間 陽樹<br>(Graduate School of<br>Medicine)                        | 2 J   | tennis  | Tennis is a popular recreational sports at all ages. This<br>class aims to acquire basic skills, rules, and manners of<br>tennis, and, most importantly, to enjoy playing tennis<br>regardress of one's skills.   | Students will understand and put in a practice of basic skills, rules, and manners of tennis.  | <ol> <li>Guidance</li> <li>How to use racket and ball</li> <li>Rally with a short distance</li> <li>Strokes (forehand)</li> <li>Strokes (backhand)</li> <li>Servives</li> <li>Serve return</li> <li>Volley (forehand)</li> <li>Volley (backhand)</li> <li>Singles games (half court)</li> <li>Singles games (full court)</li> <li>Doubles games (full court)</li> <li>Doubles games in league match</li> <li>Doubles games in tournament</li> </ol>   | Evaluation is performed<br>comprehensively based on the<br>participation in class (70-80%),<br>the degree of proficiency (10-<br>20%), and a report (10%).  |                                   |                    |  |                            | Upon joining the class, you<br>need to have your own shoes<br>appropriate for playing tennis<br>and also need to wear<br>sportswear when you play.  |
| CB53248 Spo | ts A Fall,<br>Frii/3rd | Common Subjects-<br>Health Sciences | 1 AMC                | Akira SATO<br>佐藤 明<br>(Graduate School of<br>Medicine)                           | 2 J   | Kyudo<br>(Japanese<br>Archery –<br>Rules of<br>Shooting and<br>Etiquette) | As many of the students will be studying Kyudo for the<br>first time, they will learn the basics of handling the bow<br>and arrows, and drawing and releasing the bow.<br>Students will learn how the skills in Kyudo are based on<br>a deep understanding of the mechanics of the human<br>body and the characteristics of the equipment; in<br>addition to learning how to hit a target, they will gain a<br>rational and aesthetic understanding of the postures and<br>movements.   | Because Kyudo techniques and etiquette are very closely related, students will learn shooting techniques<br>and correct movements in formalized situations. Shooting techniques are comprised of a systematic set of<br>rules for handling the bow, while etiquette is composed of modes of traditional behavior. The goal of the<br>class is to enable students to gain a scientific understanding of the rational postures/movements, and to<br>learn to adapt their experiences into daily life.  | Although learning shooting skills is the first priority, etiquette will also be learned step by step in each class as it is fundamental to posture and movement. Students will experience the fun and difficulties of Kyudo through games and competitions.<br>1. Guidance: Hazard prevention and safety measures. Summary of technique and etiquette<br>2. Introduction: Basics of shooting. Basics of standing posture<br>3. Holding the bow and gripping the string / two kinds of sitting posture ("Kiza," "Seiza") / three-breath-bowing<br>4. Principles of positioning the limbs (lower and upper body) / two kinds of bowing in sitting position ("Shikkenrei,"<br>"Sesshurei") / two-breath-bowing<br>5. Adjusting the body posture / the "Three Crosses" / two more kinds of bowing in sitting position ("Takushurei",<br>"Soshurei")<br>6. Setting the grip on the bow to control it correctly ("Tenouchi") / one more kind of bowing in sitting position<br>("Goshurei")<br>7. The leather archery glove ("Yugake") and its usage / walking in Kyudo<br>8. "The Five Crosses" and determining correct shooting form / the "Five Crosses" / "Suriashi" -walking<br>9. Drawing the bow / main points of "Uchiokoshi" and "Hikiwake" / synchronization of breathing and movements<br>10. Obtaining full draw length / drawing until "Yazuka" / various types of body turn<br>11. Arms and trunk forming a cross ("Tateyokojumonji," "Hanare no Jumonji") / turning the body while walking<br>12. Tips for reliably hitting the target (the four requirements in "Tsumeai") / moving forward and backward while<br>kneeling ("Shikko," "Shittai")<br>13. Important technical points about hitting or missing the target (vertical and horizontal "Nobia") / "Sonkyo"<br>14. The end of the shot (important aspects of "Zanshin") / synchronization of movements with breathing ("Ikiai")<br>15. Conclusion: Skill test - Hit 1m diameter target at a distance of 28m in the basic posture and movements | Students must attend class, as<br>learning the body movements<br>requires practice. Grades will<br>be based on attendance rate<br>and skill tests. Students will<br>take a practical examination,<br>shooting 79cm diameter target<br>at a distance of 28m, according<br>to the rules of formal technique<br>and etiquette. |                                   |                    |  |                            |   |
| CB53249 Spo | ts A Fall,<br>Frii/3rd | Common Subjects-<br>Health Sciences | 1 AMC                | Toshihiko FUJIMOTO<br>藤本 敏彦<br>(Institute for Excellence in<br>Higher Education) | 2 J   | Softball  | The aim of "Sports A: Softball class is constructed of two<br>part. First part is "Team management" and Second part<br>is Coaching". Goal of first part is to lean the team<br>management that is how to relation with team member<br>using softball game. Goal of second part is to lean the<br>coaching that is how to make menu of practice and to<br>teach for member.  | The aim of "Sports A: Softball class is constructed of two part. First part is "Team management" and<br>Second part is Coaching". Goal of first part is to lean the team management that is how to relation with<br>team member using softball game. Goal of second part is to lean the coaching that is how to make menu of<br>practice and to teach for member.  | <ul> <li>First part. Team management. Number of classes:1-8.</li> <li>1. Guidance.</li> <li>2. Decision of own objective and team formation.</li> <li>3. Softball practice and Communication with team mate.</li> <li>4. Softball practice and team production.</li> <li>5. Softball game and team condensation.</li> <li>6. Softball game and leadership.</li> <li>7. Softball game and norm within the team.</li> <li>8. Softball game, review and team management.</li> <li>Second part. Coaching. Number of classes: 9-15.</li> <li>9. Softball game and coaching theory 1: Assessment.</li> <li>10. Softball game and coaching theory 2: Feedback.</li> <li>11. Softball game and coaching theory 3: Teaching of softball practice.</li> <li>12. Softball game and coaching theory 5: Reflection.</li> <li>13. Softball game and coaching theory 6: Belief of teaching.</li> <li>15. Softball game and review.</li> </ul>  | Examination 50% and short<br>review report on every class<br>50%.<br>Grades of the course will be<br>assigned as follows:<br>AA······.Excellent (90-<br>100%)<br>A·····.Good (80-89%)<br>B·····.Fair (70-79%)<br>C·····.Passing (60-<br>69%)<br>D·····.Failure (0-59%)  |                                   |                    |  |                            | Place: Kawauchi field.  |