1. Class Subject

History of Tohoku University

2. Object and Summary of Class

What sort of a university is Tohoku University? This course covers the history of Tohoku University to help students understand the characteristics of this University from a historical perspective.

3. Goal of Study

The goal is for each of you to acquire the following knowledge and abilities through this course.

(a) To be able to understand and explain Tohoku University’s history by using some concrete examples.
(b) To be able to survey and describe the features of your university, department and laboratory from a historical point of view.

4. Contents and Progress Schedule

This course is centered on a lecture and a field trip. The contents and schedule are as shown below.

1. Introduction
2. Field trip (Sendai City Museum)
3. The Foundation (Tohoku University Museum)
4. Open Door Policy
5. Development of University I
6. Development of University II
7. Student Life
8. Field trip (University Library)
9. Student Union
10. (World War II and Peace) Reforms
11. Field trip (University Archives)
12. University Campus
13. University Refectory
14. University Idols

5. Evaluation Method

Half of your grade will be based on attendance and understanding of the course (Minute Paper, 50%), while the other half will be based on the final report (50%). *Students will be requested to complete the Minute Paper at the end of the first class session. The maximum number of participants for this course is 40 due to the limitation of the number of students that can be enrolled in this course. Successful course participants will earn the credit for this course.

6. Textbook and References

No textbooks will be used. References are handed out at every class.

Office hour: from 12:00 to 16:00 on Wednesday. Make an appointment in advance via e-mail or other means.

7. URL

https://www.wileyplus.com/

This course requires purchase of the WileyPlus system which costs $40 USD. The system includes an electronic version of the required textbook with many integrated features to facilitate understanding of the subjects and problem solving skill in physics. The system also comes with a self-diagnostic tool, ORION, with which one will practice problem solving based on his/her own proficiency in each chapter that will be covered in the course. Evaluation of the students will be based on their performance in the WileyPlus and payment method will be announced in the course and the first lecture.

In Addition

For those planning to take Physics B on and C, the WileyPlus account that is purchased in this course will be reserved, and no additional payment is necessary. A survey of conceptual understanding of the subject will be conducted at the first and last lecture to assess the effectiveness of the instructional method.

8. Preparation and Review

Students will be requested to write a short essay after each field trip. Students will be requested to write the final report at the end of the semester.

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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)

9. Evaluation Method

Homework assignments (1 or 2 times): 80-100%
Participation in class: at most 20%
Final report (50%)
1. Class Subject
The course uses the evolution of the universe from Big Bang to now to introduce various scientific subjects. It is important to help students understand the major concepts of the course and the important issue of evolution. The course will use the reference book "The Big History Project" which has been adapted for first-year students. The course will include discussions about the evolution of life, the origin of life, and the development of the universe.

2. Object and Summary of Class
The course will cover a variety of topics, including the evolution of life, the origin of life, and the development of the universe. The course will be divided into two parts: the first part will focus on the evolution of life, and the second part will focus on the development of the universe.

3. Goal of Study
The goal of the course is to help students understand the evolution of life and the development of the universe. This will be done through discussions, lectures, and group work.

4. Contents and Progress Schedule
The course will cover the following topics:

- Introduction to the evolution of life
- The origin of life
- The development of the universe
- The role of humans in the universe

5. Evaluation Method
The course will be evaluated based on class attendance, reports, and on the results of the final examination.
World of Fine Arts

Object: FGL. Language: E

1. Class Subject

Japanese Art History

2. Object and Summary of Class

Art shows (and encompasses) the way we comprehend and understand this Universe. Therefore Art should be regarded as a visual philosophy, not as a mere illustration of history based on written documents. Therefore, the importance of learning its history, in this case, Japanese Art History, can never be exaggerated.

3. Goal of Study

The objective of this course is to provide an outline and basic knowledge about Japanese Art History ranging from the beginning of human habitation in the Japanese archipelago to the present, including the art of the Jomon, Yayoi, Kofun, Asuka and Nara, Heian, Kamakura, Muromachi, Azuchi-Momoyama, Edo, Meiji, Taisho, Showa and Heito Periods.

4. Contents and Progress Schedule

1. Course Orientation: What is Art?
   2. Art of Jomon Period
   3. Art of Yayoi and Kofun Periods
   4. Asuka-Hakone Art: the Reception of Buddhism
   5. Art of Nara Period
   6. Art of Heian Period
   7. Art of Kamakura Period
   8. Art of Nanbokucho/Momoyama Period
   9. Art of Momoyama Period
   10. Art of Edo Period I
   11. Art of Edo Period II
   12. Art of Meiji Period
   13. Art of Taisho, Showa and Heito Periods (1)
   14. Art of Taisho, Showa and Heito Periods (2)

5. Evaluation Method

Evaluation will be based on final report (70%), performance in the class room (30%).

6. Textbook and References


7. URL

Chemistry B

Object: FGL. Language: E

1. Class Subject

General and physical chemistry

2. Object and Summary of Class

In this course, main emphasis will be given to the fundamentals and concepts that provide a basis for understanding physical chemistry, underpin physical principles that govern the properties and behavior of chemical systems. It would be also an essential course by giving a series of lectures on different topics of physical chemistry.

3. Goal of Study

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 equilibrum as well as reaction kinetics.

4. Contents and Progress Schedule

1. Quantitative concepts of temperature, work, internal energy and heat
2. Classical mechanics and Newton’s second law of motion
3. First law of thermodynamics
4. Barometric formula, van der Waals equation, enthalpy and heat capacity
5. Contour lines, the second law of thermodynamics
6. Entropy, the third law of thermodynamics, thermodynamic equations of state
7. Kinetic theory of gases, model of a perfect gas
8. Types of average speeds, collision with a surface
9. Mid-term test
10. Reaction kinetics and reaction rate equation
11. First, second and third order reactions
12. Reversible first order reaction, parallel first order reaction
13. Comparative first order reaction, mechanisms of chemical reactions
14. Radical reactions, unbranched and branched chain reactions
15. Term-end test

5. Evaluation Method

Evaluation will be based on class attendance, on the results of short quizzes, mid-term and term-end tests.

6. Textbook and References

Physical Chemistry Ira N. Levine 2008 Atkins Physical Chemistry P. Atkins, J. de Paula, J. Keeler 2014

7. URL

Calculus A

Object: FGL. Language: E

1. Class Subject

Fundamentals of Calculus

2. Object and Summary of Class

This class is a gentle introduction to the fundamental concepts of calculus (differentiation and integration) and focus mostly on practical skills with examples, in order to apply these tools on real problems.

3. Goal of Study

The student will learn the basic notions of limits of a function, of the derivative of an integral of a function. And to some extent how to apply these tools on practical problems.

4. Contents and Progress Schedule

The class will follow the tentative schedule below:

1. Limits of functions, continuity
2. Differentiation of functions, the derivative
3. Chain rule of functions, the derivative of functions
4. Higher-order derivatives of functions
5. Applications of derivatives
6. Second-order derivative, convex, concave functions
7. Taylor series of functions
8. Approximate calculation of definite integrals
9. Mid-term exam
10. Logarithmic and exponential functions. Their derivatives
11. Integral and areas. Definitions and concepts
12. Computation of integrals
13. Computation of integrals, areas, volume
14. Application of integrals
15. Summatory and review
16. Final exam

5. Evaluation Method

Based on the scores of final and mid-term exams as well as participation in class (homework submission).

6. Textbook and References

7. URL

8. Preparation and Review

Homework will be given on a regular basis to check the understanding of the materials taught.
**<13> Economics**

**Object:** FGL. **Language:** E

Course Code: CBI2128. Fall, Tue/Thu (2 credits) .
Instructor: Dan QIN (Graduate School of Economics and Management)

1. **Class Subject**
   - Introduction to Basic Principles of Economics
   - Time Series Analysis and Forecasting

2. **Object and Summary of Class**
   This course covers the fundamental principles of microeconomics, which focuses on individual and market behavior. The course begins with an introduction to supply and demand, and then covers the concepts of demand, supply, and equilibrium. The course also covers topics such as market structures, price determination, and consumer surplus.

3. **Goal of Study**
   The purpose of this course is to provide students with a solid understanding of microeconomic principles that are relevant to their future careers.

4. **Contents and Progress Schedule**
   - Week 1: Introduction to Microeconomics
   - Week 2: Supply and Demand
   - Week 3: Demand and Elasticity
   - Week 4: Market Structures
   - Week 5: Price Determination
   - Week 6: Consumer Surplus

5. **Evaluation Method**
   - 20% Class Attendance
   - 30% Midterm Exam
   - 50% Final Exam

**<14> Foundations of Linear Algebra**

**Object:** FGL. **Language:** E

Course Code: CBI2268. Fall, Mon/Thu (2 credits) .
Instructor: Marcin SCHROEDER (Institute for Excellence in Higher Education)

1. **Class Subject**
   - Introduction to Linear Algebra

2. **Object and Summary of Class**
   - This course is an introduction to the fundamental concepts of linear algebra, including vector spaces, linear transformations, and matrix theory. The course will cover topics such as systems of linear equations, matrix operations, determinants, eigenvalues, and eigenvectors.

3. **Goal of Study**
   - The goal of this course is to provide students with a solid understanding of linear algebra concepts and their applications.

4. **Contents and Progress Schedule**
   - Week 1: Introduction to Linear Algebra
   - Week 2: Vector Spaces
   - Week 3: Linear Mappings
   - Week 4: Matrices
   - Week 5: Determinants
   - Week 6: Eigenvalues and Eigenvectors
   - Week 7: Additional Topics

5. **Evaluation Method**
   - 20% Midterm Exam
   - 30% Final Exam

**<15> Linear Algebra A**

**Object:** FGL. **Language:** E

Course Code: CB3255. Fall, Tue/Thu (2 credits) .
Instructor: Marcin SCHROEDER (Institute for Excellence in Higher Education)

1. **Class Subject**
   - Linear Algebra

2. **Object and Summary of Class**
   - This course is an introduction to the fundamental concepts of linear algebra, including vector spaces, linear transformations, and matrix theory. The course will cover topics such as systems of linear equations, matrix operations, determinants, eigenvalues, and eigenvectors.

3. **Goal of Study**
   - The goal of this course is to provide students with a solid understanding of linear algebra concepts and their applications.

4. **Contents and Progress Schedule**
   - Week 1: Introduction to Linear Algebra
   - Week 2: Vector Spaces
   - Week 3: Linear Mappings
   - Week 4: Matrices
   - Week 5: Determinants

5. **Evaluation Method**
   - 20% Midterm Exam
   - 30% Final Exam

**<16> Basic Japanese A**

**Object:** FGL. **Language:** E

Course Code: CB4201. Fall, Mon/Thu, Tue/Thu, Thu/Fri (4 credits) .
Instructor: Natsuki Sugaya, Kei YOSHIMOTO (Institute for Excellence in Higher Education), Atsuko UCHIYAMA

1. **Class Subject**
   - Japanese Language

2. **Object and Summary of Class**
   - This course is designed for students who are new to Japanese language and culture. The course will cover basic Japanese grammar, vocabulary, and sentence structures.

3. **Goal of Study**
   - The goal of this course is to provide students with a solid foundation in Japanese language skills.

4. **Contents and Progress Schedule**
   - Week 1: Introduction to Japanese Language
   - Week 2: Basic Japanese Grammar
   - Week 3: Basic Japanese Vocabulary
   - Week 4: Basic Japanese Sentence Structures

5. **Evaluation Method**
   - 20% Class Attendance
   - 20% Midterm Exam
   - 60% Final Exam
Health

Object: FGL. Language: E

1. Class Subject

Health

2. Object and Summary of Class

Health

1. Course Code: CB4215. Fall, Thu/4th (2 credit).
2. Instructor: Ryoichi NAGATOMI (Graduate School of Biomedical Engineering)

3. 7th Misc. strokes pt. 4

4. 8th Misc. strokes pt. 5

5. 9th Misc. strokes pt. 6

6. 10th Basic skills for enjoying doubles games pt. 1

7. 11th Basic skills for enjoying doubles games pt. 2

8. 12th Basic skills for enjoying doubles games pt. 3

9. 13th Basic skills for enjoying doubles games pt. 4

10. 14th Basic skills for enjoying doubles games pt. 5

11. 15th Concluding remarks and Trainings

From the 2nd class on, content will be arranged based on assessment of

FGL

AMB

Language: J

Students will come to enjoy exercising through actively participating in sports

Tennis, Badminton, Soccer (associated football)

Course Code: CB23253. Fall, Tue/3rd (1 credit).
Instructor: Akira SATO (Graduate School of Medicine)

Objective: Jumonji”) / turning the body while walking

12. Tips for reliably hitting the target (the four requirements in "Nobori") / "Sonkyo"

13. The end of the shot (important aspects of "Zanshin") /

14. D15. Advanced tactics: taking advantages of the team members

15. The player hits the shuttlecock, which their partner then returns, so the player then hits it back to the partner again. This is essentially a form of communication. Both beginners and experts are welcome in this class.

9. Contents and Progress Schedule

1. Course Code: CB23254. Fall, Tue/3rd (1 credit).
Instructor: Ryoichi NAGATOMI (Graduate School of Biomedical Engineering)

6. Textbook and References

7. URL

8. Preparation and Review

9. In Addition

Sports A

Object: AMB. Language: J

1. Class Subject

Sports A

2. Object and Summary of Class

Sports A

1. Course Code: CB23252. Fall, Tue/3rd (1 credit).
Instructor: Akira TAMAGAWA (Graduate School of Medicine)

6. Textbook and References

7. URL

8. Preparation and Review

9. In Addition

Sports A

Object: AMB. Language: J

1. Class Subject

Sports A

2. Object and Summary of Class

Sports A

1. Course Code: CB23254. Fall, Tue/3rd (1 credit).
Instructor: Ryoichi NAGATOMI (Graduate School of Biomedical Engineering)
Sports A

Course Code: CB3255. Fall, Tue/3rd (1 credit).
Instructor: Toshihiko FUJIMOTO (Institute for Excellence in Higher Education)

1. Class Subject

Kendo (Japanese Archery - Rules of Shooting and Etiquette)

Object: AMB. Language: J

2. Object and Summary of Class

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 learn the team management that is how to relate with team member using softball game. Goal of second part is to learn the coaching that is how to make norms of practice and to train for member.

3. Goal of Study

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 learn the team management that is how to relate with team member using softball game. Goal of second part is to learn the coaching that is how to make norms of practice and to train for member.

4. Contents and Progress Schedule

2. Division of own objective and team formation.
3. Softball practical and Coaches with team mate.
4. Softball practice and team production.
5. Softball game and team combination games.
6. Softball game and team competition games.
7. Softball game and norm within the team.
8. Softball game, review team management.
9. Softball game and coaching theory 3: Team management.
10. Softball game and coaching theory 2: Feedback.
12. Softball game and coaching theory 4: Study form.

8. Preparation and Review

Place: Kawasaki field.

5. Evaluation Method

Examination 50% and short review report on every class 50%
Grades of the course will be assigned as follows:
AA-----Excellent (90-100%)
A------Good (80-89%)
B------Favorable (70-79%)
C-----Passing (60-69%)
D------Failure (0-59%)

Sports A

Course Code: CB53217. Fall, Fri/3rd (1 credit).
Instructor: Akira SATO (Graduate School of Medicine)

Kyudo (Japanese Archery - Rules of Shooting and Etiquette)

Object: AMC. Language: J

1. Class Subject

Kyudo (Japanese Archery - Rules of Shooting and Etiquette)

Object: AMB. Language: J

2. Object and Summary of Class

As many of the students will be studying Kyudo for the first time, they will learn the basics of handling the bow and arrows, and drawing and releasing the arrow. Students will also be learning about the basic rules and etiquette that are part of Kyudo. This class is based on a deep understanding of the mechanics of the human body and the characteristics of the bow and arrow. The goal of the class is to enable students to gain a rational and aesthetic understanding of the postures and movements.

3. Goal of Study

Because Kyudo techniques and etiquette are very closely related, students will learn shooting techniques and correct movements in formalized situations. Shooting techniques are improved on a systematic set of rules and the correct way to handle the bow. The goal of the class is to enable students to gain a rational and aesthetic understanding of the postures and movements. Students will experience the joy of Kyudo through guidance and competition.

4. Contents and Progress Schedule

Although learning shooting skills is the first priority, etiquette will also be taught, as Kyudo is a traditional sport with specific cultural traditions and protocols. Students will experience the fun and difficulty of Kyudo through games and competitions.
2. Introduction: Basics of shooting, Basics of standing posture
3. Holding the bow and gripping the string / two kinds of sitting posture ("Kiri" / "Shita") / three breath-bowing
4. Principles of positioning the limbs (lower and upper body) / two kinds of bowing in sitting position ("Shikkenkiri", "Zenkuri") / two breath-bowing
5. Adjusting the body posture / the "Three Crosses" / two more kinds of bowing in sitting position ("Takashima", "Shishin")
6. Setting the grip on the bow / using correct grip / bowing in sitting position ("Kake"") / "Shita"
7. Setting the grip on the bow (correct grip) / bowing in sitting position ("Takashima", "Shishin")
8. The "Five Crosses" and determining correct shooting form / the "Five Crosses" / Shikko" / "Shita"
9. Drawing the bow / main points of "Ichikohitsuki" and "Hikinake" / "Shita"
10. Staying in proper shooting position / the "Five Crosses" / "Shita"
11. Drawing the bow / main points of "Ichikohitsuki" and "Hikinake" / "Shita"
12. Drawing the bow / main points of "Ichikohitsuki" and "Hikinake" / "Shita"
13. Important technical points about sitting or missing the target (vertical and horizontal) / "Shita"
14. The end of the class / important points of "Zan" / "Zan"
15. Conclusion: Skill test - Hit 1m diameter target at a distance of 28m in the basic posture and movements

5. Evaluation Method

Students must attend class, as the learning body movements requires practice. Grades will be based on attendance rate and skill tests. Students will take a practical examination, shooting 75cm diameter target at a distance of 28m, according to the rules of formal technique and etiquette.

6. Textbook and References

7. URL

8. Preparation and Review

Place: Kawasaki field.

9. In Addition

Evaluation is performed comprehensively based on the participation in class (70-80%), the degree of proficiency (10-20%), and a report (10%).

Sports A

Course Code: CB32516. Fall, Fri/3rd (1 credit).
Instructor: Hanni MOMMA (Graduate School of Medicine)

1. Class Subject

Object: AMB. Language: J

2. Object and Summary of Class

"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 learn the team management that is how to relate with team member using softball game. Goal of second part is to learn the coaching that is how to make norms of practice and to train for member.

3. Goal of Study

Students will understand and put in a practice of basic skills, rules, and manners of tennis.

4. Contents and Progress Schedule

1. Guidance
2. How to use the bat and ball
3. Rally with a short distance
4. Strokes (forehand)
5. Strokes (backhand)
6. Strokes (loft)
7. Serve return
8. Volley (forehand)
9. Volley (backhand)
10. Doubles games (half court)
11. Doubles games in league match
12. Doubles games in league match
13. Doubles games in league match
14. Doubles games in league match
15. Mixed doubles

5. Evaluation Method

Examination is performed comprehensively based on the participation in class (70-80%), the degree of proficiency (10-20%), and a report (10%).

6. Textbook and References

7. URL

8. Preparation and Review

Upon joining the class, you need to have your own shoes appropriate for playing tennis and also need to wear sweatwear when you play.