## ◆ International Graduate Program for Global Leaders on Engineering Systems with Humanities, Social Sciences, and Cultural Studies (IGP-GLES)（プログラム名）

### 1. Program Outline（プログラム概要）

Our program aims to bring up future global leaders in such various fields as policy making, national administration, legal institutes, industry, education, and academic research. We accept excellent students from all over the world, and bring them up to be of capability and skills required to solve essential problems on engineering systems with harmonization among human, organizations, societies, cultures, and science and technology. In order to achieve our goals, we provide courses on knowledge of human, organizations, societies, cultures, science and technology, and Japanese style management technologies, which have obtained the world's respects and reputations.

### 2. Course Outlines and Faculty（コース概要及び学習目標）

Subjects in the program are offered by the faculties of the departments below in Graduate School of Decision Science and Technology, utilizing strong and abundant resources related not only to engineering systems but also humanities, social sciences, and cultural studies. In addition, subjects on skills for academic research and knowledge of Japanese language and life will be also offered so as to educate students who will work as a bridge between Japan and their own countries.

Graduate School of Decision Science and Technology:
- Department of Human System Science;
- Department of Value and Decision Science;
- Department of Industrial Engineering and Management;
- Department of Social Engineering.

### 3. Guide to Study in International Graduate Program for Global Leaders on Engineering Systems with Humanities, Social Sciences, and Cultural Studies (IGP-GLES)（学習内容）

Our program is characterized by:

i) Numbers of courses on knowledge of human, organizations, societies, cultures, science and technology, and Japanese style management technologies, all of which are provided in English;

ii) Interactive classes with discussion and presentation on engineering systems problems from global perspectives, in order for the students to obtain skills to utilize the knowledge and the technologies;

iii) Transdisciplinary workshops which involve students, instructors, and experts to build up the visions of future global societies resolving engineering systems problems;

iv) Growing human resource network of the students, the instructors, and the experts who will participate in our program and will be global leaders of the future world.

Courses are categorized according to the University's general rule as follows:

Category A: Research Courses (研究科目群)
- A-1: Seminar Courses (講究科目) : Colloquium
- A-2: Graduate Research Courses (研究関連科目): Workshop, Seminar, and Practical Exercise

Category B: Courses by Departments (専門科目群)
- B-1: Departmental Courses (専攻専門科目)
- B-2: Courses in Other Departments (他専門科目)

Category C: Liberal Arts and General Education (大学院教養・共通科目群)
- C-1: Courses Designated by Program (プログラム指定科目)
- C-2: International Communication (G) (大学院国際コミュニケーション科目)
- C-3: Interdisciplinary Courses (G) (大学院総合科目)
- C-4: Interdepartmental Courses (G) (大学院広域科目)
- C-5: Arts and Humanities (G) (大学院文明科目)
- C-6: Career Development Courses (G) (大学院キャリア科目)
- C-7: Courses for Developing Creativity (G) (大学院創造性育成科目)
- C-8: Courses for International Students (G) (大学院留学生科目)

Courses in Category B (Courses by Departments (専門科目群)) and those in Category C-4 (Interdepartmental Courses (G) (大学院広域科目)) are classified with respect to the combination of approaches and objects as follows (for example, a course with "J-4" as "Contents #" is on "Cultures" with "Japanese style approach"):

Approaches: Japanese (J) or Global (G)
- J-*: Japanese style approach
- G-*: Global standard approach

Objects: From 1 to 6
- *-1: Human
- *-2: Organizations
- *-3: Societies
- *-4: Cultures
- *-5: Science and Technology
- *-6: Management Technology

Courses in Category C-1 (Courses Designated by Program (プログラム指定科目)) and those in Category C-2 (International Communication (G) (大学院国際コミュニケーション科目)) are on skills for academic research, which are assigned "S" as Contents #. Courses in Category C-8 (Courses for International Students (G) (大学院留学生科目)) are on knowledge of Japanese language and life, which are assigned "K" as Contents #.

Skills and Knowledge
- S: Skills for academic research
- K: Knowledge of Japanese language and life

Regarding the Contents # of the courses in other Categories, please kindly consult your supervisor or program manager.

## 4. Graduation Requirements（修了要件）

【Master's degree】

For a Master's degree, following requirements must be met:

I) The University's general rule:

i) 30 credits or more in total from Graduate school courses (大学院授業科目).

ii) 18 credits or more from Category A (Research Courses (研究科目群)) or Category B (Courses by Departments (専門科目群)).

iii) 2 credits or more from Category C (Liberal Arts and General Education (大学院教養・共通科目群)).

iv) Passes Master's-thesis examination and the final examination.

II) Program rule:

i) Category A (Research Courses (研究科目群)):

a) 4 credits of International Colloquium I-IV (in Category A-1 (Seminar Courses (講究科目)))

b) 8 credits of International Workshops I-IV (in Category A-2 (Graduate Research Courses (研究関連科目)))

Within the International Workshops, students are required to attend all seminars which will be held four times in a semester and give at least one presentation on their own research in a year.

c) 1 credit or more (out of 2) of International seminars I-II (in Category A-2 (Graduate Research Courses (研究関連科目)))

d) 1 credit or more (out of 2) of International Practical Exercises I-II (in Category A-2 (Graduate Research Courses (研究関連科目)))

ii) Category B (Courses by Departments (専門科目群)):

a) 6 credits or more from Category B (Courses by Departments (専門科目群))

Students are recommended to take all courses in Category B (Courses by Departments (専門科目群)) with (c), which are core courses in our Program, in the table below (see 4. Tables of Course Subjects).

iii) Category C (Liberal Arts and General Education (大学院教養・共通科目群)):

a) 2 credits or more from Category C-1 (Courses Designated by Program (プログラム指定科目)), Category C-2 (International Communication (G) (大学院国際コミュニケーション科目)), or Category C-8 (Courses for International Students (G) (大学院留学生科目)).

iv) Master's thesis

a) Students must submit a Master's thesis and take the final examination and evaluation of his/her thesis.

【Doctoral degree】

For the doctoral degree, the following requirements must be met:

I) The University's general rule:

i) 12 credits of International Colloquium V-X (in Category A-1 (Seminar Courses (講究科目)))

ii) Passes Doctoral-dissertation examination and the final examination.

II) Program rule:

i) Category A:

a) 12 credits of International Colloquium V-X (in Category A-1 (Seminar Courses (講究科目)))

b) 12 credits of International Workshops V-X (in Category A-2 (Graduate Research Courses (研究関連科目)))

Within the International Workshops, students are required to attend all seminars which will be held four times in a semester and give at least one presentation on their own research in a year.

ii) Other Categories:

a) 10 credits or more from Category B (Courses by Departments (専門科目群)) or International Off-Campus Projects (in Category C-1 (Courses Designated by Program (プログラム指定科目)))

Students are recommended to take all courses in Category B (Courses by Departments (専門科目群)) with (c), which are core courses in our Program, in the table below (see 4. Tables of Course Subjects).

iii) Doctoral dissertation

a) Students must submit Doctoral dissertation and take the final examination and evaluation of his/her thesis. In addition to Doctoral dissertation, students must have two or more published journal papers and one or more academic presentation at international conference, or, one published journal paper and three or more academic presentations at international conferences.

## 5. Tables of Course Subjects

### Research Courses (研究科目群): Category A

**Category A-1: Seminar Courses (講究科目) : Colloquium**

| Course Number | Remarks* (see footnotes) | Subject | Department Offering course*** | Credit | Chair | Semester S: Spring A:Autumn | Opening year a: Annually e: Even o: Odd |
|---|---|---|---|---|---|---|---|
| 65705 (HUM), 66705 (VAL), 67705 (IE&M), 68705 (SOC) | R, MP | International Colloquium in Decision Science and Technology (XXX) I** | HUM, VAL, IE&M, SOC | 0-1-0 | Academic Adviser | A | a |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 65706 (HUM), 66706 (VAL), 67706 (IE&M), 68706 (SOC) | R, MP | International Colloquium in Decision Science and Technology (XXX) II** | HUM, VAL, IE&M, SOC | 0-1-0 | Academic Adviser | S | a |
| 65707 (HUM), 66707 (VAL), 67707 (IE&M), 68707 (SOC) | R, MP | International Colloquium in Decision Science and Technology (XXX) III** | HUM, VAL, IE&M, SOC | 0-1-0 | Academic Adviser | A | a |
| 65708 (HUM), 66708 (VAL), 67708 (IE&M), 68708 (SOC) | R, MP | International Colloquium in Decision Science and Technology (XXX) IV** | HUM, VAL, IE&M, SOC | 0-1-0 | Academic Adviser | S | a |
| 65851 (HUM), 66851 (VAL), 67851 (IE&M), 68851 (SOC) | R, DP | International Colloquium in Decision Science and Technology (XXX) V** | HUM, VAL, IE&M, SOC | 0-2-0 | Academic Adviser | A | a |
| 65852 (HUM), 66852 (VAL), 67852 (IE&M), 68852 (SOC) | R, DP | International Colloquium in Decision Science and Technology (XXX) VI** | HUM, VAL, IE&M, SOC | 0-2-0 | Academic Adviser | S | a |
| 65853 (HUM), 66853 (VAL), 67853 (IE&M), 68853 (SOC) | R, DP | International Colloquium in Decision Science and Technology (XXX) VII** | HUM, VAL, IE&M, SOC | 0-2-0 | Academic Adviser | A | a |
| 65854 (HUM), 66854 (VAL), 67854 (IE&M), 68854 (SOC) | R, DP | International Colloquium in Decision Science and Technology (XXX) VIII** | HUM, VAL, IE&M, SOC | 0-2-0 | Academic Adviser | S | a |
| 65855 (HUM), 66855 (VAL), 67855 (IE&M), 68855 (SOC) | R, DP | International Colloquium in Decision Science and Technology (XXX) IX** | HUM, VAL, IE&M, SOC | 0-2-0 | Academic Adviser | A | a |
| 65856 (HUM), 66856 (VAL), 67856 (IE&M), 68856 (SOC) | R, DP | International Colloquium in Decision Science and Technology (XXX) X** | HUM, VAL, IE&M, SOC | 0-2-0 | Academic Adviser | S | a |

* R: Required, MP: Master's Program, DP: Doctoral Program

** "XXX" is HUM, VAL, IE&M, or SOC, depending on the department to which the student belongs.

*** HUM: Department of Human System Science

*** VAL: Department of Value and Decision Science

*** IE&M: Department of Industrial Engineering and Management

*** SOC: Department of Social Engineering

**Category A-2: Graduate Research Courses (研究関連科目): Workshop, Seminar, and Practical Exercise**

| Course Number | Remarks* (See footnotes ) | Subject | Department Offering course*** | Credit | Chair | Semester S: Spring A:Autumn | Opening year a: Annually e: Even o: Odd |
|---|---|---|---|---|---|---|---|
| 65715 (HUM), 66715 (VAL), 67715 (IE&M), 68715 (SOC) | R, MP | Decision Science and Technology International Workshop (XXX) I** | HUM, VAL, IE&M, SOC | 0-2-0 | Academic Adviser | A | a |
| 65716 (HUM), 66716 (VAL), 67716 (IE&M), 68716 (SOC) | R, MP | Decision Science and Technology International Workshop (XXX) II** | HUM, VAL, IE&M, SOC | 0-2-0 | Academic Adviser | S | a |
| 65717 (HUM), 66717 (VAL), 67717 (IE&M), 68717 (SOC) | R, MP | Decision Science and Technology International Workshop (XXX) III** | HUM, VAL, IE&M, SOC | 0-2-0 | Academic Adviser | A | a |
| 65718 (HUM), 66718 (VAL), 67718 (IE&M), 68718 (SOC) | R, MP | Decision Science and Technology International Workshop (XXX) IV** | HUM, VAL, IE&M, SOC | 0-2-0 | Academic Adviser | S | a |
| 65861 (HUM), 66861 (VAL), 67861 (IE&M), 68861 (SOC) | R, DP | Decision Science and Technology International Workshop (XXX) V** | HUM, VAL, IE&M, SOC | 0-2-0 | Academic Adviser | A | a |
| 65862 (HUM), 66862 (VAL), 67862 (IE&M), 68862 (SOC) | R, DP | Decision Science and Technology International Workshop (XXX) VI** | HUM, VAL, IE&M, SOC | 0-2-0 | Academic Adviser | S | a |
| 65863 (HUM), 66863 (VAL), 67863 (IE&M), 68863 (SOC) | R, DP | Decision Science and Technology International Workshop (XXX) VII** | HUM, VAL, IE&M, SOC | 0-2-0 | Academic Adviser | A | a |
| 65864 (HUM), 66864 (VAL), 67864 (IE&M), 68864 (SOC) | R, DP | Decision Science and Technology International Workshop (XXX) VIII** | HUM, VAL, IE&M, SOC | 0-2-0 | Academic Adviser | S | a |
| 65865 (HUM), 66865 (VAL), 67865 (IE&M), 68865 (SOC) | R, DP | Decision Science and Technology International Workshop (XXX) IX** | HUM, VAL, IE&M, SOC | 0-2-0 | Academic Adviser | A | a |
| 65866 (HUM), 66866 (VAL), 67866 (IE&M), 68866 (SOC) | R, DP | Decision Science and Technology International Workshop (XXX) X** | HUM, VAL, IE&M, SOC | 0-2-0 | Academic Adviser | S | a |

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|---|---|---|---|---|---|---|---|
| 65709 (HUM), 66709 (VAL), 67709 (IE&M), 68709 (SOC) | R, MP (first year) | International Seminar in Decision Science and Technology (XXX) I** | HUM, VAL, IE&M, SOC | 0-1-0 | Academic Adviser | A | a |
| 65710 (HUM), 66710 (VAL), 67710 (IE&M), 68710 (SOC) | R, MP (first year) | International Seminar in Decision Science and Technology (XXX) II** | HUM, VAL, IE&M, SOC | 0-1-0 | Academic Adviser | S | a |
| 65719 (HUM), 66719 (VAL), 67719 (IE&M), 68719 (SOC) | R, MP (first year) | International Practical Exercise in Decision Science and Technology (XXX) I** | HUM, VAL, IE&M, SOC | 0-1-0 | Academic Adviser | A | a |
| 65720 (HUM), 66720 (VAL), 67720 (IE&M), 68720 (SOC) | R, MP (first year) | International Practical Exercise in Decision Science and Technology (XXX) II** | HUM, VAL, IE&M, SOC | 0-1-0 | Academic Adviser | S | a |

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*** SOC: Department of Social Engineering

## Courses by Departments (専門科目群): Category B

### Category B-1: Departmental Courses (専攻専門科目)

| Course Number | Remarks* (See footnotes ) and Contents # | Subject | Department Offering course** | Credit | Chair | Semester S: Spring A:Autumn | Opening year a: Annually e: Even o: Odd |
|---|---|---|---|---|---|---|---|
| 65056 | MP, DP, G-1 | Introductory Cognitive Psychology (c)*** | HUM | 2-0-0 | K. Yamagishi | S | a |
| 65076 | MP, DP, G-5 | Web-based Learning System (c)*** | HUM | 2-0-0 | M. Murota | A | o |
| 65066 | MP, DP, G-5 | Introduction to Bayesian Statistics | HUM | 1-0-0 | S. Mayekawa | S | a |
| 65061 | MP, DP, G-1 | Introduction to Brain Science and fMRI | HUM | 1-0-0 | H. Akama | A | a |
| 65062 | MP, DP, G-1 | Introduction to Cognitive Linguistics | HUM | 1-0-0 | H. Akama | A | o |
| 65067 | MP, DP, G-1 | Computational Brain Science and Complex Networks with Matlab (SPM) | HUM | 0-2-0 | K. Wakita and H. Akama | S | a |
| 65068 | MP, DP, G-1 | Human Economic Science by Mathematica | HUM | 0-2-0 | H. Akama | S | e |
| 65069 | MP, DP, G-5 | Parallel Programming Basics with MPI | HUM | 0-1-0 | (to be arranged) | A | a |
| 66065 | MP, DP, J-4 | Values in Comparative Culture | VAL | 2-0-0 | A. Omura | A | a |
| 66066 | MP, DP, G-6 | International Management | VAL | 2-0-0 | R. Magnier -Watanabe | S | a |
| 66064 | MP, DP, J-1 | The Philosophy and Practice of Collaborative Deliberation | VAL | 2-0-0 | M. Toyoda | A | a |
| 66030 | MP, DP, G-3 | Social Systems Modeling | VAL | 2-0-0 | T. Inohara | A | a |
| 66081 | MP, DP, G-3 | Decision-making Analysis in the Nuclear Age (c)*** | VAL | 2-0-0 | M. Ikegami | A | a |

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|---|---|---|---|---|---|---|---|
| 67056 | MP, DP, G-6 | Marketing | IE&M | 2-0-0 | S. Chung | A | a |
| 67038 | MP, DP, G-6 | Design Thinking (c)*** | IE&M | 2-0-0 | H. Umemuro | S | a |
| 67055 | MP, DP, G-6 | Financial Statement Analysis and Valuation | IE&M | 2-0-0 | K. Nagata | A | s |
| 67006 | MP, DP, G-2 | Ergonomics for Organization and Systems Design (c)*** | IE&M | 2-0-0 | K. Itoh and H. Aoki | A | a |
| 67032 | MP, DP, G-2 | Business Information Systems Project | IE&M | 2-0-0 | D. Senoo | S | a |
| 67062 | MP, DP, J-6 | IT Value in Practice | IE&M | 2-0-0 | J. Iijima and D. Senoo | A | a |
| 67060 | MP, DP, J-2 | Transdisciplinary Collaboration Practice | IE&M | 0-0-2 | D. Senoo and Y. Tou | A | a |
| 67020 | MP, DP, J-5 | History of Science and Technology and Environmental Problems | IE&M | 2-0-0 | M.Kaji | S | a |
| 67082 | MP, DP, G-6 | Design Business | IE&M | 1-1-0 | H. Umemuro | A | a |
| 68059 | MP, DP, G-3 | Recent Developments in Game Theory | SOC | 0-1-0 | S. Muto | S | a |
| 68068 | MP, DP, J-3 | Urban Planning and Development in Japan (c)*** | SOC | 2-0-0 | N. Nakai | A | a |

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** IE&M: Department of Industrial Engineering and Management

** SOC: Department of Social Engineering

*** (c): core course

## Category B-2: Courses in Other Departments (他専門科目)

| Course Number | Remarks* (See footnotes ) and Contents # | Subject | Department Offering course | Credit | Chair | Semester S: Spring A:Autumn | Opening year a: Annually e: Even o: Odd |
|---|---|---|---|---|---|---|---|
| 70020 | MP, DP, G-1 | Rural Telecommunications | Dept. of International Development Engineering | 2-0-0 | J. Takada and T. Aoyagi | A | a |

* MP: Master's Program, DP: Doctoral Program

## Liberal Arts and General Education (大学院教養・共通科目群): Category C

| **International Communication（大学院国際コミュニケーション科目）: Category C-2**<br>**Interdisciplinary Courses（大学院総合科目）: Category C-3**<br>**Interdepartmental Courses（大学院広域科目）: Category C-4**<br>**Arts and Humanities（大学院文明科目）: Category C-5**<br>**Career Development Courses（大学院キャリア科目）: Category C-6**<br>**Courses for Developing Creativity（大学院創造性育成科目）: Category C-7**<br>**Courses for International Students（大学院留学生科目）: Category C-8** | Remarks<br>**See below table for Courses Designated by Program (プログラム指定科目): Category C-1** |
|---|---|

| Course Number | Remarks* (See footnotes ) and Contents # | Subject | Department Offering Course*** | Credit | Chair | Semester S: Spring A:Autumn | Opening year a: Annually e: Even o: Odd |
|---|---|---|---|---|---|---|---|

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 65060 | MP, DP | Presentation Skills | HUM | 1-1-0 | K. Matsumoto and S. Mayekawa | S | a |
| 66045 | MP, DP | Effective Presentations in English | VAL | 1-1-0 | A. Omura | A | a |
| 66054 | MP, DP | International Research Internship I | VAL | 0-2-0 | T. Inohara | S | a |
| 66055 | MP, DP | International Research Internship II | VAL | 0-2-0 | T. Inohara | A | a |
| 66056 | MP, DP | International Research Presentation I | VAL | 0-2-0 | T. Inohara | S | a |
| 66057 | MP, DP | International Research Presentation II | VAL | 0-2-0 | T. Inohara | A | a |
| 65505 (HUM), 66505 (VAL), 67505 (IE&M), 68505 (SOC) | DP | Decision Science and Technology International Off-Campus Project (XXX) I** | HUM, VAL, IE&M, SOC | 0-4-0 | Academic Adviser | A | a |
| 65506 (HUM), 66505 (VAL), 67505 (IE&M), 68505 (SOC) | DP | Decision Science and Technology International Off-Campus Project (XXX) II** | HUM, VAL, IE&M, SOC | 0-4-0 | Academic Adviser | S | a |

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** "XXX" is HUM, VAL, IE&M, or SOC, depending on the department to which the student belongs.

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## 6. Syllabus of Course Subjects

### Category B-1: Departmental Courses (専攻専門科目)

**65056**

**Introductory Cognitive Psychology**

Spring Semester (2-0-0)

Assoc. Prof. Kimihiro YAMAGISHI

I. Objective

This lecture covers basics of cognitive psychology, with emphasis on memory, learning, reasoning, and decision making.

As an introductory course, familiarity with experimental psychology is not necessary prior to registration.

II. Content

Week 1-6: Structure and function of Memory
Week 7: Essay Quiz 1
Week 8-14: Higher-order cognition and development
Week 15: Essay Quiz 2

III. Grading: There will be two quiz sessions, and the evaluation reflects the quality of quiz answers.

Textbook Reference: Books by Kathleen Galotti or Robert Solso bearing “cognitive psychology” in their titles would be helpful. They are not required readings, and the lectures design assumes the necessity of no textbook.

Conditions: Registration for the course requires no prerequisites.

Comments from lecturer: English is the language of instruction.
Students should master written and oral English at the level of 60-64 score in Internet-Based TOEFL.

**65076**

**Web-based Learning System**

Autumn Semester (2-0-0) Even year in Japanese; Odd year in English

Prof. Masao MUROTA

I. Objective

First part of this course includes the essence of the Internet protocols and technologies as a basic knowledge of Web-based learning system. Then this course introduces basic and advanced technologies and learning theories for a Web-based learning system. I will explore network protocols, fundamental application protocols, and guidelines to develop effective multimedia contents based on learning theory.

II. Contents

1: Introduction
2: Introduction to the Internet
3: Network Layer
4: Transport Layer
5: Domain Name System
6: E-mail System
7: World Wide Web
8: Web Interaction Technologies (1): CGI, Cookie
9: Web Interaction Technologies (2): Ajax, DOM
10: Web Interaction Technologies (3): HTML5
11: Guidelines for effective e-Learning contents (1)
12: Guidelines for effective e-Learning contents (2)
13: Guidelines for effective e-Learning contents (3)
14: Advanced e-Learning (1)
15: Advanced e-Learning (2)

Note: Fundamental knowledge on computer system and programming language of Perl, JavaScript, and HTML is recommended, but not mandatory.

**65066**

**Introduction to Bayesian Statistics**

Spring Semester (1-0-0)

Prof. Shinishi MAYEKAWA

I. Objective

Starting from mathematical presentation such as probability distribution, linear algebras, we will study the theory of Bayes and its extension, natural conjugate distribution, hierarchical Bayes, numerical resolution such as MCMC, other logit profit models and Bayesian network.

The credit of this course can be used to complete the International Human Economic Science Special Course that commenced in April 2009.

**65061**

**Introduction to Brain Science and fMRI**

Autumn Semester, Intensive Course (1-0-0)

Assoc. Prof. Hiroyuki AKAMA

I. Objectives

As a new functional magnetic resonance imaging (fMRI) environment will be established in Tokyo Tech, this subject provides skills in neuroimaging data acquisition and analysis using the fMRI scanner (Signa HDxt 3.0T, GE Healthcare) in the O-okayama campus. In the control room of the fMRI laboratory, students will get the basic knowledge about the cognitive brain science from a guest lecturer, fMRI specialist who will be invited from abroad.

II. Contents

1. Basic concepts of brain science
2. } Neurological techniques for brain science (TBA)
3. }
4. }
5. } Advanced themes (TBA)
6. }
7. }

III. Comments

Attention: This course is subject to further revisions.

Feel free to contact Prof. Akama (akama@dp.hum.titech.ac.jp)

**65062**

**Introduction to Cognitive Linguistics**

Autumn Semester, Intensive course (1-0-0) Odd year in English

Assoc. Prof. Hiroyuki AKAMA, and others

I. Objectives

Embodiment theory, which now plays an important role within cognitive linguistics, leads us to situate language capacity within a more general theory of body and mind, action and perception, movement and imagery. The body-based approach within linguistics is founded on biological substrates that seek to understand the language capacity within the total range of human behavior, just as the branches of economics--behavioral economics, cognitive economics and neural economics--are increasingly being oriented in that direction. This course seeks to position and schematize cognitive and neural linguistics within a new research field called "embodied economics" with the perspective of synergizing different domains within the human system sciences.

II. Contents

1. Basic concepts of cognitive linguistics
2. } Cognitive aspects of the lexicon
3. }

4.
5.
6. } Evolving fields of embodiment theory
7.

III. Comments

Feel free to contact Prof. Akama (akama@dp.hum.titech.ac.jp)

**65067**

**Computational Brain Science and Complex Networks with Matlab (SPM)**

Spring Semester (0-2-0)

Assoc. Prof. Ken WAKITA, Assoc. Prof. Hiroyuki AKAMA, and others

I. Objectives

Matlab is a high-level programming language which provides us effective computational methods with matrices and vectors as well as fantastic tools of image analysis and visualization. This has made this software package very useful for the sciences of complex networks as well as the neural sciences targeting the most important example of complex networks, the brain of an animal. Especially Matlab is considered as crucial for the fMRI (functional magnetic resonance imaging) studies that we are now expecting to enhance at Tokyo Tech all the more because the Graduate School Decision Science and Technology has installed an fMRI scanner (Signa HDxt 3.0T, GE Healthcare) in the O-okayama campus. This course provides trainings for Matlab, using the GSIC Educational System and the Tsubame II Grid Cluster, so that students can develop essential knowledge for analyzing human networks, neural networks and finally fMRI brain image data with SPM (statistical parametric mapping), Matlab based package offering plenty of neuroimaging techniques. Students will also learn in the fMRI laboratory the basic literacy of fMRI experiment based on the introductory skills of Matlab programming.

II. Contents

1. Computer literacy and Matlab
   (1) Procedures for obtaining a Tsubame II account and introduction to Tsubame II literacy
   (2) File manipulation techniques
   (3) Basic operations with Matlab
   (4) Computation of data matrices with Matlab
   (5) Complex networks with Matlab
2. fMRI with Matlab (SPM)
   (1) Installation of SPM and basic usage
   (2) fMRI literacy: experiment design
   (3) fMRI literacy: stimulus and trigger signals
   (4) fMRI literacy: experiment
   (5) fMRI literacy: data analysis

III. Comments

Attention: This course is subject to further revisions.

This lecture course will be held in one of the Practical Rooms in the Global Scientific Information and Computing Center (GSIC) (3rd floor) and the fMRI laboratory of the Graduate School of Decision Science and Technology. The access information can be found at the following URLs.

http://www.gsic.titech.ac.jp/contents/campusmap.html.ja

http://www.gsic.titech.ac.jp/contents/campusmap.html.en

No special knowledge about Matlab is required.

Please feel free to contact Prof. Wakita (wakita@is.titech.ac.jp)

**65068**

**Human Economic Science by Mathematica**

Spring Semester (0-2-0)

Assoc. Prof. Hiroyuki AKAMA

I. Objectives

Mathematica is a particularly ingenious, highly precise, and yet very user-friendly, programming language. From the perspective of human economic science, it is most suitable for 1) complicated symbolic computations that include vast amounts of terms, 2) analytical and numerical solutions to equations, differential equations and minimization calculations, 3) and accurate and aesthetic visualizations of graphs and figures. This class provides practice exercises using the GSIC Educational System and the Tsubame Grid Cluster to teach how to utilize Mathematica for economics and cognitive psychology calculations, such as equation solutions, linear algebra (list, vector and matrix manipulations), statistics (descriptive statistics, regressions, ANOVAs), graphs and complex networks, and simulations of complex systems.

II. Contents

1. Procedures for obtaining an Tsubame account and introduction to Tsubame literacy
2. Mathematica: Its features and interfaces--Symbolic programming, use of notebook and math commands for Tsubame computation
3. Basic built-in functions of Mathematica: Numerical calculations and algebraic calculations
4. Basic built-in functions of Mathematica: Linear algebra--List, vector and matrix manipulation
5. Basic built-in functions of Mathematica: Uploading and downloading data; 2-D and 3-D graphics
6. Functional programming, operators and their syntax
7. Functions, packages and batch processing
8. Pattern matching, logical operations and flow controls
9. Application to human economic science: Statistical analyses
10. Application to human economic science: Solving equations
11. Application to human economic science: Differential and integral calculus
12. Application to human economic science : Combinatorica and network computations

13.–15. Practice in more advanced programming

III. Comments

Lecture materials, as used in 2009, can be downloaded from the following URL (only within the campus). However, a total update of the materials is planned for 2010.

http://www.b.cc.titech.ac.jp/~39499864/Mathematica/

This lecture course will be held in one of the Practical Rooms in the Global Scientific Information and Computing Center (GSIC) (3rd floor). The access information can be found at the following URLs.

http://www.gsic.titech.ac.jp/contents/campusmap.html.ja

http://www.gsic.titech.ac.jp/contents/campusmap.html.en

No special knowledge about Mathematica is required.

Please feel free to contact Prof. Akama (akama@dp.hum.titech.ac.jp)

**65069**

**Parallel Programming Basics with MPI**

Spring Semester (0-2-0)

Chair to be arranged

I. Objectives

This course aims to introduce basics of parallel programming with MPI (Message Passing Interface) on a

Supercomputing Grid Cluster named TSUBAME, as well as focusing on the design of parallel algorithms for solving problems in the area of human economic science.

**66065**

**Values in Comparative Culture**

Autumn Semester (2-0-0)

Lecturer, Azusa OMURA

I. Objective

The chief objective of the course is to consider the relationship between Japanese culture and Western culture. By examining descriptions of Western culture in Japanese literature, students will discover how the Japanese have perceived and transformed Western culture into their own culture through modernization.

Another objective is to explore how Western people have observed Japan and the difference between images of ‘traditional Japan’ and ‘modern Japan’ in modern Western literature. The study of Western people’s attitudes toward ‘modern Japan’ will help students to understand present-day Japan as a part of the international society.

This course will encourage students to understand Japanese culture in a comparative way.

II. Contents

This course offers a comparative study on modern Japanese culture (from the Meiji Restoration to the Second World War) from various perspectives, particularly focusing on the influence of Western culture. Students are required to attend all classes and submit two essays in English. All texts are read and discussion is conducted in English.

[Schedule]

Class 1 General Introduction to the Course
Class 2 The Background of Modern Japan
Class 3 Yanagita Kunio, *Tono monogatari* (The Legends of Tono)
Class 4 Yanagita Kunio, *Tono monogatari* (The Legends of Tono)
Class 5 Natsume Soseki, *Michikusa* (Grass by the Wayside)
Class 6 Natsume Soseki, *Michikusa* (Grass by the Wayside)
Class 7 Tanizaki Jun’ichiro, *Aoi hana* (Aguri)
Class 8 Tanizaki Jun’ichiro, *Aoi hana* (Aguri)
Class 9 East and West during World War II 1
Class 10 East and West during World War II 2
Class 11 Yoshimoto Banana, *Kitchen*
Class 12 Yoshimoto Banana, *Kitchen*
Class 13 Murakami Haruki, *Umibe no Kafka* (Kafka on the Shore)
Class 14 Murakami Haruki, *Umibe no Kafka* (Kafka on the Shore)
Class 15 Summary

III. Grading

The course evaluation is based on attendance, participation in discussion and two essays. Students are required to submit two essays discussing topics that will be given later.

**66066**

**International Management**

Spring Semester (2-0-0)

Lecturer, Remy MAGNIER-WATANABE

I. Objective

The International Management course is intended to be a challenging advanced management course for

undergraduate and graduate students. Students will gain a general overview of the process and effect of internationalization in contemporary business, along with an introduction to theories, concepts and skills relevant to managing effectively in today's global environment. Students will be challenged to integrate knowledge they have gained from other courses and apply their accumulated knowledge to business case studies. Students will engage in analytical problem-solving related to managing in the international environment and will frequently be called upon to brief their findings to the class.

The course primarily uses a combination of lecture, class discussion, case analysis, group and individual assignments.

II. Contents

This course focuses on the challenges and opportunities associated with organizational management and business strategy in the global environment. This class is aimed at anyone who wants to understand the people, culture, geography, and politics of international business.

[Schedule]

Part I: Environmental Foundation

1. Globalization and International Linkages
2. The Political, Legal, and Technological Environment
3. Ethics and Social Responsibility

Part II: The Role of Culture

4. The Meanings and Dimensions of Culture
5. Stakeholders, Strategies, and Decision-making
6. Organizational Culture and Diversity
7. Cross-Cultural Communication and Negotiation

Part III: International Strategic Management

8. Strategy Formulation and Implementation
9. Entry Strategies and Organizational Structures
10. Foreign Direct Investment and Managing Political Risk
11. Staffing, Training, and Compensation for Global Operations
12. Capstone Session: Group Project Presentations
13. Capstone Session: Group Project Presentations
14. Final Exam

III. Grading

| | |
|---|---|
| Participation | 20% |
| Group Case Presentation | 20% |
| Group Foreign Entry Strategy Project | 30% |
| Final Exam | 30% |

IV. Textbook and reference

None; all materials will be provided in class.

**66064**

**The Philosophy and Practice of Collaborative Deliberation**

Autumn Semester (2-0-0)

Lecturer, Mitsuyo TOYODA

I. Objective

The aim of this seminar is to strengthen students' understanding of the importance of collaborative deliberation through the practice of dialogical inquiry. The major expectations are: 1) students demonstrate their ability to participate in constructive dialogues, and 2) students deepen their understanding of the value of collaborative deliberation in public decision processes. Both individual and group works will be involved in this course.

II. Contents

This seminar is designed to help students deepen their understanding of the values of collaborative deliberation through the practice of dialogical inquiry. Students learn what conditions are necessary for constructive dialogue, and develop their attitudes and skills for participating in communicative deliberation. They will also explore the importance of collective thinking in public decision processes by studying the cases of democratic decision processes.

[Schedule]

- Introduction
- Safety and community
- Developing a community of inquiry
- Various types of communication
- Different modes of thinking
- Democratic decision processes
- Process of deliberation in public projects
- Philosophy of deliberative democracy
- Reflections

III. Grading

Attendance, Participation (60%)

Presentation (40%)

IV. Comments from lecturer

The contents of the course may change depending on students' abilities and needs. The class will be mostly given in English. Students are expected to actively participate in class activities such as paired and group discussions. Reading and writing assignments will be given.

V. Textbook and reference

Handouts will be distributed in class.

**66030**

**Social Systems Modeling**

Autumn Semester (2-0-0)

Prof. Takehiro INOHARA

I. Objective

Mathematical modeling methods and mathematical analysis methods for social systems are presented through lectures and exercises. This course covers definitions, examples and analysis methods of games in normal form, games in extensive form, option forms, graph models, simple games, games in characteristic function form, and so on, as models for analyzing decision making situations. Methods of coalition analysis and attitude analysis, and a mathematical model of consensus building are also introduced.

Students are required to submit three reports: a report on the background and the detail of a real-world decision making situation (Background Report), that on the model of the situation (Model Report) and that on the analysis of the situation (Analysis Report). Also, they are required to give a poster presentation based on these reports at the end of the term.

This course aims to cultivate the students' abilities to: select an appropriate model for analyzing a focal decision making situation; describe a real-world decision making situation by a model; analyze the model and take out some insights on the situation from the results of the analysis; convey the analysis results to others concisely.

II. Contents

[Schedule]

Week 1: Lecture plan, Preliminaries on mathematical symbols, Classification of decision making situations

Week 2: Competitive decision making situations 1: Games in normal form

Week 3: Competitive decision making situations 2: Games in extensive form with perfect information
Week 4: Competitive decision making situations 3: Games in extensive form with imperfect information
Week 5: Competitive decision making situations 4: Option forms
The deadline for submitting Background Report
Week 6: Feedback on Background Report
Week 7: Competitive decision making situations 5: Graph models
Week 8: Social decision making situations 1: Simple games and committees
Week 9: Social decision making situations 2: Games in characteristic function form
Week 10: Advanced Analysis Methods 1: Coalition analysis of competitive decision making situations
The deadline for submitting Model Report
Week 11: Feedback on Model Report
Week 12: Advanced Analysis Methods 2: Attitude analysis of competitive decision making situations
Week 13: Advanced Analysis Methods 3: A mathematical model of consensus building
Week 14: Presentations
Week 15: Presentations
The deadline for submitting Analysis Report

III. Grading

The course evaluation is based on three reports (20% each), presentation (20%), and poster (20%)

IV. Comments

Prospective students should be familiar with mathematical expression and analysis and have interests in social problems.

This course is designated as one of the elective courses for the Education Program for Consensus Building (http://www.ipcob.org/course/) and for the Education Program for Science of Policy for Science & Technology. The students are recommended to be enrolled in at least one of these Education Programs. Detailed explanations on the enrollment in these courses can be found in each web site.

Contact courses_at_valdes.titech.ac.jp for more inquiry.

**66081**

**Decision-making Analysis in the Nuclear Age**

Autumn Semester (2-0-0)

Prof. Masako IKEGAMI

I. Objective

This course is designed to introduce the historical case studies of critical decision-making over the development and use of nuclear weapons and technology. Main topics include: the Manhattan Project, atomic bombing of Hiroshima and Nagasaki, Cuban missile crisis, nuclear arms race during the Cold War, weapons of mass destruction (WMD) proliferation, North Korean and Iranian nuclear crises, missile defence, arms control & nuclear non-proliferation, and nuclear energy. Some policy issues, such as nuclear arms control and disarmament, nuclear deterrence, nuclear diplomacy and nuclear energy, are also included.

Upon completion of the course, students are expected to be able to:

- acquire the basic concepts and understanding of the topics covered in this course thorough literature reading;
- develop capabilities of analyzing the historical and current cases of critical decision-making over the development and use of nuclear technology;
- demonstrate capabilities of discussing the complexity of specific nuclear policy issues through critical thinking and essay work.

II. Contents

Class 1 Introduction
Class 2 The Manhattan Project: Developing the Atomic bomb
Class 3 Decision-making of the use of the Atomic bomb
Class 4 Origins of the Cold War and initial nuclear proliferation
Class 5 The Cuban Missile Crisis
Class 6 Nuclear arms race, doctrine and strategy
Class 7 Nuclear deterrence theory
Class 8 'Atoms for Peace': Peaceful use of atomic energy
Class 9 Détente and arms control during the Cold War
Class 10 The Strategic Defence Initiative (SDI) and missile defence
Class 11 The end of the Cold War: the INF Treaty
Class 12 Post-Cold War nuclear disarmament
Class 13 Post-Cold War nuclear proliferation
Class 14 'A world without nuclear weapons' or 'nuclear anarchy'?
Class 15 Final paper due and final presentations

III. Grading

Regular class attendance and active participation (20%), Reading response memos (three memos/10% each), Essay work (final paper) (50%)

IV. Comments

Nuclear technology – military or civilian – dominated the world in political, economic, and military terms in the latter half of the 20th century. It is an open question if we are heading toward "a world without nuclear weapons" as coined by President Obama. Knowledge of nuclear issues will deepen your understanding of the contemporary world.

IV. Textbook and reference

- Alperovitz, Gar (1996). The Decision to Use the Atomic Bomb, Vintage Books (selected pages).
- Alperovitz, Gar (1995). 'Hiroshima: Historians Reassess', *Foreign Policy* (Summer 1995) No. 99: 15-34.
- Barton J. Bernstein (1995). 'The Atomic Bombings Reconsidered', *Foreign Affairs*. 74(1) January/February, pp. 135-152.
- Barton J. Bernstein (1986). 'A Postwar Myth: 500,000 U.S. lives saved', *Bulletin of Atomic Scientists* (June-July 1986), pp. 3-8.
- Allison, Graham and Zelikow, Philip (1999). *Essence of Decision: Explaining the Cuban Missile Crisis*, New York: Longman, (selected pages).
- Schelling, Thomas (1966). Arms and Influence, New Haven and London: Yale University Press, (selected pages)
- George, A. L. & R. Smoke (1974). *Deterrence in American Foreign Policy: Theory and Practice*, New York: Columbia University Press (selected chapters)
- Robert Jervis, 'The Utility of Nuclear Deterrence', *International Security* 13: 2 (Fall 1988).
- Henry Kissinger (1957). *Nuclear Weapons and Foreign Policy*, New York: Harper and Brothers (selected chapters).
- Kennan, George F. (1982). *The Nuclear Delusion: Soviet-American Relations in the Atomic Age*, New York: Pantheon Books, (selected chapters).
- Richard Smoke (1992). *National Security and The Nuclear Dilemma: An Introduction to the American Experience in the Cold War* [3rd edition], McGraw-Hill (selected chapters).
- Scott Sagan & Kenneth Waltz (1995). *The Spread of Nuclear Weapons: A Debate Renewed*, New York: W.W. Norton (selected pages)

- Kenneth N. Waltz (1981). *The Spread of Nuclear Weapons: More may be Better*, Adelphi Paper No. 171, London: International Institute of Strategic Studies.
- Kenneth Waltz, 'Why Iran Should Get the Bomb: Nuclear Balancing Would Mean Stability', *Foreign Affairs*, vol. 91, no. 4 (July/August 2012).
- Thomas C. Reed & Danny B. Stillman (2009). *The Nuclear Express: A Political History of the Bomb and its Proliferation*, Minneapolis: Zenith Press (selected chapters).
- Schelling, Thomas (2005) 'An Astonishing Sixty Years: The Legacy of Hiroshima', Nobel Prize Lecture, 8 Dec 2005 <http://nobelprize.org/nobel_prizes/economics/laureates/2005/schelling-lecture.html>
- Jozef Goldblat (2002). *Arms Control: The New Guide to Negotiations and Agreements*, Oslo: International Peace Research Institute, Oslo, (selected pages).
- Allison, Graham, Carmoy De Herve & Delpech, Therese (2007). *Nuclear Proliferation: Risk and Responsibility*, Washington, DC: Trilateral Commission (selected pages).
- Hans Born, Bates Gill and Heiner Hänggi (eds) (2010). Governing the Bomb: Civilian Control and Democratic Accountability of Nuclear Weapons, SIPRI: Oxford University Press [excerpts] <http://books.sipri.org/product_info?c_product_id=412>
- Francis J. Gavin, 'Same as it ever was: Nuclear Alarmism, Proliferation, and the Cold War', *International Security*, vol. 34, no. 3 (Winter 2009/10), pp. 7-37.
- Deborah Welch Larson, 'The Psychology of Nuclear Statecraft', *Diplomatic History*, volume 15, issue 3 (July 1991), pp. 449–54.
- Eugene B. Skolnikoff (1994) The Elusive Transformation: Science, Technology, and the Evolution of International Politics, Princeton University Press, pp. 49-92.
- Richard Rhodes (1986) *The Making of the Atomic Bomb*, New York/London: Simon & Schuster (optional).
- 'The Atomic Bomb and the End of World War II: A Collection of Primary Sources' National Security Archive Electronic Briefing Book No. 162, edited by William Burr <http://www.gwu.edu/~nsarchiv/NSAEBB/NSAEBB162/index.htm>
- E-reference: The Nuclear Threat Initiative <http://www.nti.org/>
- Video: The Fog of War: Eleven Lessons from the Life of Robert S. McNamara (Academy Award for Documentary Feature for 2003)
- Visual reference: AtomCentral.com <http://www.atomcentral.com/default.aspx>; AtomicArchive.com <http://www.atomicarchive.com/sciencemenu.shtml>

A compendium of articles and book chapters may be included as handouts.

**67056**

**Marketing**

Autumn Semester (2-0-0)

Assoc. Prof. Sulin CHUNG

I. Objectives

Marketing is one of the various management processes employed by companies to create value for customers. The skillful marketer is able to identify or create customer needs, and then work with the various other functions within or outside the company to design and deploy capabilities to satisfy those needs better than competitors can. By the end of this course, students will: 1. be familiar with characteristics of marketing and distribution strategies and practices. 2. be able to analyze, synthesize, and integrate basic marketing theories and concepts through the use of cases.

II. Contents

・Marketing strategies and plans

・Marketing environment
・Marketing research
・Consumer value, satisfaction and loyalty
・Branding strategies
・Market segmentation, targeting and positioning
・Product and services strategy
・Pricing strategy and programs
・Marketing channel
・Marketing communications
・International marketing

**67038**

**Design Thinking**

Spring Semester (2-0-0)

Assoc. Prof. Hiroyuki UMEMURO

I. Objective

In today's society, there are a number of problems that can be solved through the thinking way of design, or design thinking, from simple designs to large and complex social problems. The goals of this class are to learn the fundamentals of design thinking, as well as to propose solutions to actual problems in the real world. Students are first to learn the concept and methods of design thinking, and then to form groups and propose solutions through actual practices, including field study, research, ideation, and prototyping.

II. Contents

- Introduction and guidance
- Fundamentals of design thinking
- Group formation and design brief
- Field Studies
- Research
- Ideation
- Prototyping
- Testing
- Refinement
- Final Proposal

III. Evaluation

Course grade will reflect the following emphases: final proposal, project report, and group work contributions.

**67055**

**Financial Statement Analysis and Valuation**

Autumn Semester (2-0-0)

Assoc. Prof. Kyoko NAGATA

I. Objectives

The objective of this course is to develop the ability to use financial statement information effectively in making economic decisions. The intended learning outcomes include

- Ability to use financial statements in ways relevant for applications such as credit analysis and equity valuation,
- Understanding of underlying economic reality behind numbers,
- Ability to detect earnings management.

II. Contents

This course will use a variety of teaching methods including lectures, readings, case assignments, and discussions for better understanding of the following issues:

- Effect of business transactions on financial statements
- Process of preparing financial statements
- Financial statement analysis
- Incentives and conditions for earnings management
- Techniques corporate managers could use in earnings management

III. Evaluation

Course grade will reflect the following emphases:

- Homework/class assignments (60%)
- Class participation (30%)
- Mid-term exam (10%)

**67006**

**Ergonomics for Organization and Systems Design**

Autumn Semester (2-0-0)

Prof. Kenji ITOH and Assoc. Prof. Hirotaka AOKI

I. Objectives

This course aims at obtaining knowledge and basic skills about the disciplines called ergonomics/human factors, their approaches and their applications to actual design of human-machine systems, work and organizations. Among various contents related to ergonomics with which people are working, this class focuses on applications of ergonomic approaches and methods to actual design and evaluation of human-machine systems and organizational aspects. Contents covered in this class are largely divided into three categories, for which some case studies are included: (1) Introduction to ergonomics (2) Human-machine interaction and usability, (3) Human errors and risk management.

II. Contents

・Basics in Ergonomics
・Applications of Ergonomics
・Ergonomic Approaches and Methods
・Human-Machine Systems and Cognitive Engineering
・Direct Manipulation
・Case study: Application to Interface design
・Usability engineering
・Human error
・Safety Culture
・Case study: Applications to Railway Safety

Note: In addition to lectures, some group assignments (+ presentation and discussion) will be made concerning some specific topics for better understanding of ergonomic concepts and approaches. Simple questions – just one page answer required – will be also given every second week in the end of lecture for the same purpose.

III. Grading

Final assignment, individual assignments, group assignments and ordinary attitudes in the class, e.g., participation in discussions and questions (+ attending status in the class).

**67032**

**Business Information Systems Project**

Spring Semester (2-0-0)

Assoc. Prof. Dai SENOO

I. Objective

The overall objectives of this course are to investigate the nature and techniques of business information systems development project. Through a semester-long project, students will learn how to set and formulate a problem and a goal of the target system.

II. Contents

- Fieldwork experience
- KJ method
- Brain storming method
- Concept creation -Metaphor, Analogy, Model
- Presentation skills
- Project management
- Soft Systems methodology

**67062**

**IT Value in Practice**

Autumn Semester (2-0-0)

Prof. Junichi IIJIMA and Assoc. Prof. Dai SENOO

I. Objective

The investments in Information Technology (IT) are increasing, however productivity at the economy, industry, and organization levels are not increasing. In order to escape this “IT Paradox”, the course sets these four objectives.

- Understand how IT generates value in intra- and inter- organizational contexts
- Learn how to formulate business strategies and use IT strategically
- Recognize conversion contingencies in IT value generation
- Describe measurements of IT value

II. Contents

- Developing and Aligning Business and IT Strategies
- Measuring IT Value in Practice
- BPM (Business Process Modeling) and BPO (Business Process Orientation)
- DEMO (Design & Engineering Methodology for Organization)
- Business Models of IT platform
- Co-creation with Customers
- Guest Lectures
- Case Discussions

**67060**

**Transdisciplinary Collaboration Practice**

Autumn Semester (0-0-2)

Assoc. Prof. Dai SENOO and Assoc. Prof. Yuji TOU

I. Objectives

The objectives of this course are to connect the theories and knowledge that students have obtained at the School to real business practices. Each project team is assigned an actual issue faced by actual companies. Through group work, students will formulate the problems and recommend original solutions. After the final presentation, students will review the whole research process based on the feedback provided by the companies, and design further personal growth strategies.

II. Contents

- Orientation
- Teaming
- Research theme assignment
- Group work
- Interim Presentation
- Group work, second phase
- Final Presentation at the company
- Feedback

**67020**

**History of Science and Technology and Environmental Problems**

Spring Semester (2-0-0)

Assoc. Prof. Masanori KAJI

I. Objective

With an emphasis on Japan, this seminar course intends to offer a survey of major environmental problems in the 20th century, while tracing the growth of environmental awareness and environmentalism worldwide. It will highlight the relationship between environmental degradation and technological and industrial development, and the threat to the environment and public health by big businesses. The topics include industrial pollution, toxic chemicals, nuclear tests and disasters, global warming and nuclear energy.

The course hopes to raise student's awareness of growing environmental problems associated with science and technology, and to give them an opportunity to explore and assess these problems critically and from multiple angles. It also aims to help them to improve their conversational and writing skills.

II. Contents

It will focus on four major topics: the issues and debates surrounding the methyl mercury poisoning of Minamata (and other industrial pollution related diseases) in Japan and Rachel Carson's *Silent Spring* (1962) in the US, both of which played a crucial role in shaping the global environmental consciousness, environmental movement and environmental policies. It will also look at the debate over global warming and nuclear energy –via the ongoing catastrophe involving the Fukushima Dai-ichi nuclear power plant- and how they are reshaping our environmental thinking and politics.

III. Grading

This course is conducted in a seminar format and in English. Class attendance and participation in discussions are essential. Students are expected to: (1) read the assigned reading or view the assigned audio-visual material prior to the class; (2) participate in classroom discussions; (3) do a mini-presentation; (4) write short papers, and (5) attend possible field trips (voluntary).

IV. Textbook and reference

- Jun Ui (ed.), *Industrial Pollution in Japan*, 1992.
- Rachel Carson, *Silent Spring*, 1962.
- Alex MacGillivray, *Rachel Carson's Silent Spring*, 2004.
- Lynn White, jr., "Historical Roots of Our Ecologic Crisis," *Science* **155** (1967): 1203-7
- Keibo Oiwa & Masato Ogata, (translated by Karen Colligan-Taylor), *Rowing the Eternal Sea: the Story of a Minamata Fisherman*, 2001.
- Akio Mishima, *Bitter Sea: The Human Cost of Minamata Disease* (Tokyo: Kosei, 1992)
- Marla Cone, *Silent Snow: the Slow Poisoning of the Arctic*, 2005
- Jeffrey Broadbent, *Environmental Politics in Japan: Networks of Power and Protest*, 1999.
- Robert Bud et al, *Inventing the Modern World: Technology since 1750*, 2000.
- Sharon B. McGrayne, *Prometheans in the Lab*, 2001.
- Brett L. Walker, Toxic Archipelago: A History of Industrial Disease in Japan, 2010.

・James Lovelock, *The Revenge of Gaia*, 2006.
・David Nye, *Technology Matters*, 2006.

**67082**

**Design Business**

Autumn Semester (1-1-0)

Assoc. Prof. Hiroyuki UMEMURO

I. Objective

Learn how to plan and establish new businesses, through lectures and hands-on group works. Though basically we will work on the design proposals in the Design Thinking class in spring semester, students who did not take Design Thinking class are also welcome to join; they may join any Design Thinking groups, or they may be given new design ideas on which they will work.

II. Contents

- Introduction and guidance
- Business models
- Marketing
- Competence
- Business plan
- Capital policy
- Final Proposal (Pitch)

III. Evaluation

Course grade will reflect the following emphases: final proposal, project report, and group work contributions.

**68059**

**Recent Developments in Game Theory**

Spring Semester (0-1-0)

Prof. Shigeo MUTO

I. Objective

Students of the master and doctorate courses report on their own research results on game theory. This is an intensive seminar including participants from our collaborated universities: Keio University, Waseda University, Seoul National University, and National Tsing Hua University in Taiwan. Students improve their presentation skills in English through discussions with other participants.

**68068**

**Urban Planning and Development in Japan**

Autumn Semester (2-0-0)

Prof. Norihiro NAKAI

I. Objective

The purpose of the lecture is to allow those overseas students who are not familiar with the Japanese urban development context to understand the Japanese planning system in general. The contents include urban and planning history of Japan, the Japanese urban planning and development system and the urban design in Japan. This lecture is provided in English in an intensive form, usually in January or February. The precise dates of the lectures will be announced in December.

**Category B-2: Courses in Other Departments (他専門科目)**

**70020**
**Rural Telecommunications**
Autumn Semester (2-0-0)
Prof. Jun-ichi TAKADA and Prof. Takahiro AOYAGI

I. Objective

Information and communication technologies enable the transfer of information instantly between any points in the world. Moreover, it has become common understanding that the ICT infrastructure is indispensable for the development of the industry and economy. However, the reality is very severe in the developing world, especially in rural and remote areas. Imbalance of the distribution of ICT infrastructure in the world has been intolerable for the long time. This lecture overviews the history, technologies and applications of ICT infrastructure in rural and remote areas, both in the social and the technical aspects.

**Category C-1: Courses Designated by Program (プログラム指定科目)**

**65060**
**Presentation Skills**
Autumn Semester (1-1-0)
Prof. Kahoko MATSUMOTO and Prof. Shin-ichi MAYEKAWA

I. Objective

The objective of this course is to provide students some basic skills for making academic presentations in English using visual aids.

**66045**
**Effective Presentations in English**
Autumn Semester (1-1-0)
Lecturer, Azusa OMURA

I. Objective

The chief objective of the course is to improve students' skills in presenting their research in academic conferences and classes in English. By gaining a basic knowledge of academic presentations in English, students will be able to compose effective presentations with visual aids. And through the two required presentations, students will study how to respond to questions from audiences and capture the audiences' attention with visual information.

This course will encourage students to present their research in English in an effective way.

II. Contents

This course offers an effective way of giving presentations in English with visual aids. Students are required to attend all classes and give two presentations in English. All texts are read, and discussion and presentations are conducted in English.

[Schedule]

Class 1 General Introduction to the Course
Class 2 Preparation for Presentations
Discussion (1) Food

Class 3 Introduction to Presentations
Discussion (2) Family
Class 4 Body of Presentations
Discussion (3) Education
Class 5 Conclusion of Presentations
Discussion (4) Human Rights
Class 6 Languages for Presentations
Discussion (5) Technology
Class 7 Students' Presentations
Class 8 Students' Presentations
Class 9 How to Use Visual Aids 1
Discussion (6) Art
Class 10 How to Use Visual Aids 2
Discussion (7) Success and happiness
Class 11 Delivering Presentations 1
Discussion (8) Poverty
Class 12 Delivering Presentations 2
Discussion (9) Journalism
Class 13 Students' Presentations
Class 14 Students' Presentations
Class 15 Summary

III. Grading

The course evaluation is based on attendance, participation in discussion and two presentations.

**66054, 66055**

**International Research Internship I and II**

Spring and Autumn Semester (2-0-0)

Prof. Takehiro INOHARA

I. Objective

This course aims to encourage students' research activity outside of Japan. A visit to a research group in a research institute abroad and participation in a summer school provided by a university outside of Japan are examples of the activity.

II. Requirements

Students are required to submit the plan of research activity outside of Japan, to carry out the plan, to submit a report about the activity, and to make a speech on the activity.

III. Comments

This course is designated as one of the courses in the Education Program for Consensus Building (http://www.ipcob.org/course/), in which students are recommended to be enrolled. Detailed explanations on the enrollment in the Education Program can be found in the above web site.

Contact courses_at_valdes.titech.ac.jp for more inquiry.

**66056, 66057**

**International Research Presentation I and II**

Spring and Autumn Semester (2-0-0)

Prof. Takehiro INOHARA

I. Objective

This course aims to encourage students' academic presentations in English in international research seminars or conferences.

II. Requirements

Students are required to submit the plan of presentation, to make the presentation, to submit a report about the presentation, and to make a speech on the presentation.

III. Comments

This course is designated as one of the courses in the Education Program for Consensus Building (http://www.ipcob.org/course/), in which students are recommended to be enrolled. Detailed explanations on the enrollment in the Education Program can be found in the above web site.

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