

## **◆ 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 5. 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

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

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

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## 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
65076	MP, DP, 2015, G-5	Web-based Learning System (c)***	HUM	2-0-0	M. Murota	A	o
65061	MP, DP, 2015, G-1	Introduction to Brain Science and fMRI	HUM	1-0-0	H. Akama	A	a
65062	MP, DP, 2015, G-1	Introduction to Cognitive Linguistics	HUM	1-0-0	H. Akama	A	o
66065	MP, DP, 2015, J-4	Values in Comparative Culture	VAL	2-0-0	A. Omura	A	a
66064	MP, DP, 2015, J-1	The Philosophy and Practice of Collaborative Deliberation	VAL	2-0-0	M. Toyoda	A	a
66081	MP, DP, 2015, G-3	Decision-making Analysis in the Nuclear Age (c)***	VAL	2-0-0	M. Ikegami	A	a
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, 2015, 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, 2015, J-3	Urban Planning and Development in Japan (c)***	SOC	2-0-0	N. Nakai	A	a

\* MP: Master's Program, DP: Doctoral Program, 2015: course ends in academic year 2015

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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, 2015, 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, 2015: course ends in academic year 2015

### 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			Remarks				
Interdisciplinary Courses (大学院総合科目): Category C-3			See below table for Courses Designated by Program (プログラム指定科目): Category C-1				
Interdepartmental Courses (大学院広域科目): Category C-4							
Arts and Humanities (大学院文明科目): Category C-5							
Career Development Courses (大学院キャリア科目): Category C-6							
Courses for Developing Creativity (大学院創造性育成科目): Category C-7							
Courses for International Students (大学院留学生科目): Category C-8							
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, 2015	Presentation Skills	HUM	1-1-0	K. Matsumoto and S. Mayekawa	S	a
66055	MP, DP, 2015	International Research Internship II	VAL	0-2-0	T. Inohara	A	a

66057	MP, DP, 2015	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

\* MP: Master's Program, DP: Doctoral Program, 2015: course ends in academic year 2015

\*\* "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)

#### 65076

#### Web-based Learning System

Autumn Semester (2-0-0) Even year in Japanese; Odd year in English (Note: This course ends in academic year 2015.)

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.

## 65061

### Introduction to Brain Science and fMRI

Autumn Semester, Intensive Course (1-0-0) (Note: This course ends in academic year 2015.)

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. }
3. } Neurological techniques for brain science (TBA)
4. }
5. }
6. } Advanced themes (TBA)
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 (Note: This course ends in academic year 2015.)

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. }
3. } Cognitive aspects of the lexicon
4. }
5. }
6. } Evolving fields of embodiment theory
7. }

### III. Comments

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

## 66065

### Values in Comparative Culture

Autumn Semester (2-0-0) (Note: This course ends in academic year 2015.)

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.

## 66064

### The Philosophy and Practice of Collaborative Deliberation

Autumn Semester (2-0-0) (Note: This course ends in academic year 2015.)

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.

## **66081**

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

Autumn Semester (2-0-0) (Note: This course ends in academic year 2015.)

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 through 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](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 & Delpesch, 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](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)

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 IJIMA 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) (Note: This course ends in academic year 2015.)

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)

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) (Note: This course ends in academic year 2015.)

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) (Note: This course ends in academic year 2015.)

Prof. Jun-ichi TAKADA and Assoc. 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**

Spring Semester (1-1-0) (Note: This course ends in academic year 2015.)

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.

**66055**

### **International Research Internship II**

Autumn Semester (0-2-0) (Note: This course ends in academic year 2015.)

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](mailto:courses_at_valdes.titech.ac.jp) for more inquiry.

**66057**

**International Research Presentation II**

Autumn Semester (0-2-0) (Note: This course ends in academic year 2015.)

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.

Contact [courses\\_at\\_valdes.titech.ac.jp](mailto:courses_at_valdes.titech.ac.jp) for more inquiry.

[Important]

Following the education reform in April 2016, in principle, new courses equivalent to those currently available will be offered.

Regarding the newly offered courses, please check the cross-reference table that will be available on Tokyo Tech's website at a later date.