

## Premedical Course

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### Japanese

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Ikuko Noro, *Associate Professor*

#### General Summary

##### *Suitability for patients of printed materials written in Japanese*

Two kinds of informed-consent documents used in a regional hospital in Nishinomiya City were evaluated by 400 patients. At the same time, 100 physicians and nurses working at the hospital attempted to predict the results of patients' evaluation. There were 3 main findings: patients understood only 60% of the contents, patients regard the feeling of ease to be as important as readability when reading informed consent documents, and physicians and nurses underestimated the degree of patients' understanding.

##### *Methodology for analyzing medical interviews in Japanese*

I held a workshop about how to use the Roter Interactional Analysis System, a well-known method for analyzing medical interviews, with other researchers.

#### Research Activities

##### *Presentations*

"Modifying SAM's readability component for the Japanese language." Bull Hijiya Univ No. 13, 2006.

## Social Science (Law)

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Ryuichi Ozawa, *Professor*

#### General Summary

Problems of constitutional law in present-day Japan.

#### Research Activities

I addressed the problems of constitutional law in present-day Japan, especially pacifism, parliamentary democracy, the welfare state, and the judicial system. I presented a paper at a seminar titled "Democracy Representative and Government of Opinion" at the 7<sup>th</sup> seminar on French-Japanese public law sponsored by the University of Montpellier I. I also reported at a seminar titled "Unequal Society and Constitutional Law" at the

“Unequal Society and the Safety-Net” working party of the Legal Committee of the Science Council of Japan.

### Publications

**Ozawa R.** Judicial reform and Japanese constitutional law. *Ho no Kagaku* 2006; **36**: 14-20.

**Ozawa R.** Constitutional reform vision of Japanese business circles. *Jichi to Bunken* 2006; **25**: 78-86.

**Ozawa R.** Legal profession in critical era. *Kenpou Riron Sosho* 2006; **15**: 151-63.

**Ozawa R.** A case of posting in Katushika. Extra edition of Houritu-jihou. 2006. p. 279-83.

## Human Science

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Takao Fukuyama, *Professor*

### General Summary

The study of modern German philosophy and ethics.

### Research Activities

I have been working with other Japanese scholars of philosophy on a Japanese translation of Jürgen Habermas’s anthology, *Between Naturalism and Religion*, which is to be published in 2008. In particular, I worked on the two chapters, “Public Space and Political Publicity” and “Pre-political Foundation of the Democratic Constitutional State?” Habermas is a leader of the Frankfurt School, which was founded 1924 and studies the relation of economy, culture, and the individual in a comprehensive program called “critical theory.” Recently Habermas published *Facticity and Validity*, in which he searches for the ethics of discussion in the constitutional state and emphasizes the importance of solidarity in democracy.

## English

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Osamu Ohara, *Professor*

Tetsuro Fujii, *Associate Professor*

### General Summary

*English audiovisual education and the history of the English language (Ohara)*

*English Language Communication and Education: Material Analysis and Development (Fujii)*

Ohara continued his study of graphology concerning the letters of Margaret Paston and the letters of the Celys in the fifteenth century. Ohara also continued an investigation

of how to make useful digitized images and XML files of fifteenth century manuscripts, especially of the *Cely Letters*, together with Dr. Karina H. van Dalen-Oskam of the Huygens Institute (The Hague, the Netherlands) and Professor Katsuhide Sonoda of the University of Hokkaido. The results of this investigation were presented at a session of the 78th Conference of the English Literary Society of Japan at Chukyo University. Fujii studied the communicative and learning strategies for second-language learners. He also analyzed materials for learners, with a focus on dictionaries, vocabulary, testing, and extensive reading. He took an action research approach to find ways of making students autonomous language-learners and to develop materials that facilitate language acquisition.

### Research Activities

Ohara read a paper at a session titled “Making Electronic Files of Medieval Documents and their Use” at the 78th General Meeting of the English Literary Society of Japan held at Chukyo University in Nagoya. In this paper, Ohara compared the graphemic and graphetic characteristics of Richard I and Richard II, showed that there are three different hands under the name of Richard I, and demonstrated that we could revise the current edition and make the useful XML text of the letters.

Fujii compiled two vocabulary textbooks for second-language learners which are based on teaching theories and research findings on vocabulary usage on the Test of English for International Communication. Fujii also presented about lexicography in “The Characteristics of Sample Sentences that Best Illustrate Target Lexemes” at the 45<sup>th</sup> national conference of the Japan Association of College English Teachers in Osaka in September 2006 and about “Comprehensible Example Sentences from Learner Perspectives” at the 3<sup>rd</sup> Vocabulary Research Conference of the Japan Association of College English Teachers in Tokyo in December 2006.

### Publications

**Ohara O.** “Re-examination of the amanuenses of Margaret Paston.” in: *English Corpus Studies*, No. 13. 2006. p. 131–5.

### Books

**Fujii T, Miyano T.** *Ultimate vocabulary for TOEIC TEST basic 2200* (in Japanese). Tokyo: Goken Publishing Co; 2006.

**Fujii T, Miyano T.** *Ultimate vocabulary for TOEIC TEST advanced 2700* (in Japanese). Tokyo: Goken Publishing Co; 2006.

## German

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Yoshiaki Shirasaki, *Associate Professor*

### Research Activities

#### *Literature in the era of poetical realism*

On the basis of earlier historical and regional research on German poems of the 19<sup>th</sup> century, I have concentrated on clarifying realism as a Pan-European concept of literature with reference to the traditional thoughts of the ancient Greeks and the scholarly ideas of realism.

#### *Schiller*

Friedrich Schiller has been regarded merely as a representative poet of German classicism or as a typical dramatist of German idealism. I intend to show his versatility by using a comparative method that would clarify his various influences upon European literature and political history.

#### *Noh and German literature*

Noh, one of Japan's traditional theater forms with a consistent style and high artistry, includes a general character that is understood in the West. Noh is traditionally discussed in relationship with modern European theatres, and Paul Claudel and Yeats have also produced some great works that show Eastern influences. However, in addition to direct connections, both theatres' forms can be identified in German literature, such as the works Brecht and Hofmansthal. Here, I intend to clarify the relationship between Noh and Baroque theater through structural comparison.

### Reviews

**Shirasaki Y.** Schiller und Europa, Eine Forschungsbericht aufgrund eines Aufsatzes von P.M. Luetzterer Schiller u. Europa, Tokyo 2006.

## Mathematics

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Kanji Suzuki, *Professor*

### General Summary

1. Mathematical Logic: We have considered how the if-then statement  $P(x) \rightarrow Q(x)$  should be defined and concluded that, at the first stage of higher mathematical education, the definition in mathematical logic should not be introduced. Our assertions are

described below.

2. Calculus: In the double integral, there is a pair of changes of variables: one change is to polar coordinates, and the other change is  $x=uv$ ,  $y=u(1-v)$ . It is reasonable to teach these two concepts correspondingly.

### Research Activities

1. The statement  $P(x) \rightarrow Q(x)$  means  $[\forall x, (P(x) \rightarrow Q(x))]$  in mathematical logic, while, in our assertions it means [When we put  $A=\{x \mid P(x)\}$ ,  $\forall x \in A, P(x)$ ].

2. The measure of angles and the ratio of line segments are two fundamental concepts in elementary geometry. Using the angle  $\theta$ , the change to polar coordinates is described geometrically. Similarly, the change  $x=uv$ ,  $y=u(1-v)$  can be expressed geometrically using the ratio of line segments and should not be omitted.

### Publications

**Suzuki K, Fukuda K (Tokyo Metrop Univ), Eto K (Nippon Technol Univ).** On 'any' and 'some': a proposal of teaching methods different from that in mathematical logic (in Japanese). Tokyo: Mathematics Education Society of Japan (a special edition); 2006, 9.

**Suzuki K, Fukuda K, Eto K.** Two typical ways

concerning change of variables in multiple integral: polar coordinates and 'simplicial' coordinates (In Japanese). Tokyo: Mathematics Education Society of Japan (a special edition); 2007, 3.

## Physics

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Koichi Satoh, *Associate Professor*

Katsumi Kasono, *Lecturer*

### General Summary

Phospholipid membranes have been studied from several points of view, including form formation, phase transitions, interaction with ions, and optical characteristics.

### Research Activities

*Investigations of the biaxial liquid crystal phase of rectangular molecules*

A simple simulation model is assumed to be presented by tightly connected rigid spheres. We have performed Monte Carlo simulations with constant pressures on a system of 512 molecules consisting of  $5 \times 2$  spheres. We have found a crystal phase and smectic phases at low densities ( $< 50\%$ ).

### Review and Books

**Satoh K, Fujishiro T.** Physics for college students in medical and its related fields (in

Japanese). Tokyo: Tokyo Kyogakusha; 2007.

## Chemistry

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Tomoyoshi Takahashi, *Professor*

Chikao Hashimoto, *Associate Professor*

### General Summary

The research of our laboratory is focused on the synthesis of biologically active compounds and the modification of synthetic reactions.

### Research Activities

#### *Reaction of $\alpha$ -halo ketone with 2-aminothiol*

We previously reported a new type of condensation between  $\alpha$ -bromosteroidal ketones and 2-aminothiol which yields  $\alpha$ -ketospirothiazolidine derivatives. In the resulting product, the oxo group has migrated to the original position occupied by the bromine atom. Moreover, to clarify the generality of the migration of the oxo group, the reaction of cyclic and acyclic  $\alpha$ -halo alkanones with aminothiols yielded the corresponding thiazolidine derivatives. In addition, the use of microwaves was found to improve yields and shorten the reaction time in comparison with the usual conditions.

#### *Synthesis of *N*-protected dipeptide acids using amino acid-metal salts*

The application of amino acids ( $\text{H}_2\text{N-AA-COOM}$ ; M: metal ion) with a carboxyl group protected by a metal ion as an amino component has been investigated for the synthesis of *N*-protected dipeptide acids. The use of metal ions to protect the carboxyl group saves the time needed to introduce and remove the protecting group and prevents side reactions caused by the use of esters. Therefore, we examined the couplings between various amino-acid-alkali-metal salts and active esters of Boc amino acids. We found that the coupling of Boc-Ala-ONp and  $\text{H}_2\text{N-AA-COONa}$  in dimethylformamide water as a reaction solvent yields a desired dipeptide, Boc-Ala-AA-OH, in large quantities.

### Publications

**Hashimoto C, Takeguchi K<sup>1</sup>, Kodomari M<sup>1</sup> (<sup>1</sup>Shibaura Inst Technol).** An efficient synthesis of *N*-protected peptide acids using the Ca-carboxylate salts of amino acids and peptides. *Peptide Sci* 2006; 40-1.

**Horiuchi CA, Saitoh Y, Utsukihara T, Takahashi S, Matushita M, He L, Takahashi T, Hashimoto C,**

**Sugiyama T<sup>1</sup> (<sup>1</sup>Kyoto Univ), Nozaki S<sup>2</sup> (<sup>2</sup>Josai Univ).** Reaction of  $\alpha, \beta$ -unsaturated ketones with cerium (IV) salts in alcohol. *Appl Organometal Chem* 2006; **20**: 663-8.

## Biology

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Osamu Terasaka, *Professor*

Rie Hiratsuka, *Lecturer*

### General Summary

The main research subject of our laboratory is the reproductive system of seed plants. Our research is now focused on the relation between pollen tube growth and the programmed cell death of pollen tube conducting tissue.

### Research Activities

*Involvement of nucellar cell death in pollen tube elongation in gymnosperms: A comparison between Pinus densiflora and Cryptomeria japonica*

To clarify the relation between pollen tube elongation and nucellar cell death in gymnosperms, we compared *P. densiflora* and *C. japonica*, which require 14 months and 3 months, respectively, from pollination to fertilization. Pollen tube branches formed in both species, but the tube protrusion that invades the nucellar cell was observed only in *P. densiflora*. The release of vesicles from dying nucellar cells and endocytosis of the vesicles by tube occurred in both species. Tube walls in both species were labeled with the monoclonal antibody JIM13 (against arabinogalactan protein) but not with JIM7 (against pectin). In *P. densiflora*, nucellar cells in the layer around the tube died and were TUNEL-positive, but in *C. japonica* only cells in direct contact with the tube died and were TUNEL-negative. During nucellar cell death, chromatin condensation, autophagy, and secondary wall formation were observed only in *P. densiflora*. Starch grains accumulated in the nucellar cells around the tube tip of *P. densiflora* but not in *C. japonica*. These findings suggest that nucellar cell death in *P. densiflora* is apoptosis-like and participates in the formation of the aisle and the supply of nutritional materials for tube elongation. In *C. japonica*, nucellar cell death is not apoptosis-like, and the dead cells supply nutrient materials to the pollen tube less actively than do those in *P. densiflora*. We assume that the differences between *P. densiflora* and *C. japonica* result from differences in the required interval from pollination to fertilization.