

V. COMMON COURSE DESCRIPTIONS

The Common Course Descriptions define the contents of KIKAN education courses. These courses include KIKAN Education Seminar; Interdisciplinary Collaborative Learning of Social Issues; Subjects for Language and Cultures; Subjects in Humanities and Social Science; ; Subjects in Science; Cybersecurity; Subjects on Health and Sports Science and General Subjects. Course instructors are expected to follow the Common Course Descriptions while keeping their own teaching approaches.

• **KIKAN Education Seminar**

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The KIKAN Education Seminar is an introduction to learning in a university setting. "What does it mean to study at a university?" "What should I learn here?" "How should I approach learning?" In this course, students think and reflect about fundamental questions like these, share and discuss their thoughts with other students through various group activities, and learn how to express their realizations in a communicative way. One of the highlights of this course is a presentation each student gives in front of around 17 fellow students, on his or her views about learning. By both giving and listening to these presentations, as well as through the other activities in this course, students increase their understanding, self-awareness, sense of involvement, and motivation for university learning, thus building a foundation for learning that is adaptive, continuous, critical, and creative.

• **Interdisciplinary Collaborative Learning of Social Issues**

Interdisciplinary Collaborative Learning of Social Issues

In this subject, three professors with different areas of expertise take turns in teaching the three classes. Each professor presents cooperation challenges from his or her point of view related to the classroom theme they provide. In addition to listening to a lecture that helps them to understand the cooperation challenges, students do individualized tasks and group works as well. This subject aims to cultivate a positive attitude to discovering problems from a wide perspective, resoluteness and skills to continue learning to solve the problems, and the ability to cooperate with others with different specialties.

• **Subjects for Language and Cultures**

Intensive English

This course focuses on improving language management skills with English as the first foreign language within the framework of this subject. In this course, the first half of the first year will be spent reading and listening to English news on global affairs (Global Issues) while summarizing the content and thoughts individually. While cultivating the ability to present your material, you will foster a foundation that enables you to read, write and present academic content in English. The second half of the year will be spent reading and listening to English news on the subject of Japanese affairs

(Japanese Issues) while giving additional explanations on the content. The ability to digest, summarize and present your opinions in English will be cultivated while also cultivating the foundation to read, write and present academic material in English.

Japanese (Integrated Courses, Kanji Courses)

The main purpose of this course is to help students accomplish the tasks they will encounter in their daily life. This course divide levels (6 of Integrated Course and 4 of Kanji Course) based on their proficiency in Japanese. At each level students will learn grammar, vocabulary and Kanji, and how to make and use expressions appropriately through classroom activities. By the end of the course, students should be able to handle the Japanese-language skills (speaking, listening, reading and writing) appropriate to each level, and communicate with Japanese people using the expressions they have learned.

• **Subjects in Humanities and Social Science**

Introduction to Philosophy

In this course we will look at the big questions of philosophical inquiry from ancient times to the present. Although the course is grounded in philosophy, much from other disciplines in the humanities will be utilized in our approach including literary works, art, history and so forth. It is hoped that this rather wholistic approach will spark interest in a variety of themes and issues and that students will find pleasure in considering the great philosophical questions and how various thinkers and cultures have addressed them. We will proceed chronologically from the ancient world (the Epic of Gilgamesh, Plato, Aristotle, etc.) to the modern world (Nietzsche, Existentialism, and so forth). The focus will be mainly on the meaning of life. We shall not pretend to come up with a final answer, but we shall sample various answers and consider them for ourselves.

Introduction to Psychology

The course introduces psychology as a science devoted to human and social issues: an academic and applied discipline that incorporates empirical research from the social sciences, natural sciences, and humanities. Using a wide variety of experiments, observations, and surveys, psychologists attempt to understand the role of mental functions in individual and social behavior, while also exploring the underlying physiological and neural processes.

The course broadly divides into two sections. The first section, on basic functions, offers an introduction to the principal phenomena of psychology, including those pertaining to perception, attention, motivation, emotion, learning, and memory. Here the focus is on such questions as: How does the brain work? Do we really see the world the way it is? How come two people can see the same event but remember entirely different things? Are you the same person now that you were on the day you were born?

The second section, on social processes, offers an introduction to such topics as individual and cultural differences, abnormal behavior, human development, and language. Questions in this section include: Are we able to imagine exactly what another person thinks or feels? Why are some people prejudiced? What is the influence of nature versus nurture?

Introduction to Economics

This is an introductory course in economic principles and global economic issues. It explores fundamental human and social questions such as how people decide to allocate their scarce resources (e.g., time, money, attention, energy), how people interact to satisfy their needs, and how an economy works as a whole. Through the lens of simple economic models and empirical evidence, students will analyze the power of incentives, the virtues and limitations of markets, and the sources of human prosperity.

By the end of the course, students will be able to use microeconomic principles to critically evaluate everyday choices, interactions, and social issues. In addition, they will be able to use macroeconomic principles to critically evaluate the overall economic performance of a country, the effects of economic shocks, and the effects of government policies.

Global Issues

This course aims to expand students' understanding of the global issues and challenges that exist and affect our lives both in industrial and developing countries. Applying an international perspective and comparative framework, the course will examine basic human needs, social problems, and public policies and welfare programs in Japan, the U.S. and selected Asian Countries. Tentative topics covered include: globalization and social welfare, poverty and inequality, population and aging, and economic security and vulnerable groups. It will also introduce some of the key concepts and approaches in international social development.

Introduction to Law

This course encourages students to get some basic understanding of the law and law-related topics, while at the same time offering students a chance to improve on their communication skills. It will cover very basic fields of law to enable students to get a first impression of what the law is, how it influences daily life, and how it interacts with the students own field of interest.

Intercultural Encounters

This course gives students a selected exposure to cultural theory and cultural studies with an emphasis on intercultural interactions and transcultural phenomena including subcultures, popular culture, intercultural competencies, mass media, youth cultures, and public culture. Students will finish the course by writing their own original cultural analyses on a research topic of their choice.

Introduction to Japanese History

The course will provide students with an overview of Japan's history, and prepare you for any future investigations of the society in which we live. The first half of the class will examine the “pre-modern period” of Japan from its origins in the Jomon Period through to the mid-19th century, by focusing upon the emergence of the imperial state, the rise of the warrior class, and the developments of the early modern Edo period. Not only will we examine the rulership, religions, and lifestyles of the upper class courtiers and warriors, the course also explores the cultural context within which elites, commoners, and those in between lived and prospered. This includes an examination of the literature and aesthetics of the pre-modern period. This section will include a field trip to a nearby historical site.

In the second half of the course we will follow Japanese history from 1853 to the present day, including political, military, social, and economic changes. We will examine the sudden shift to Westernization in the 19th century, Japan's colonial practices in Asia in the early 20th century, the devastations of World War II, and the economic successes of the late 20th century. We will discuss Japan's current political system and economic position, and investigate the causes behind Japan's current clashes with its Asian neighbors.

Language and Communication in Society

This course explores various topics about language and communication in human society including: What is language? What is communication? How does language and communication function in society? Students will learn basic theories and discuss real-world examples of issues involving languages and communication.

• **Subjects in Science**

Computer Programming Exercise

This course mainly consists of two parts: (1) Computer Literacy and (2) Introduction of Programming. The first part provides a basic understanding of computer concepts for students to have the technical skills and knowledge about computers required in today's information age. The topics cover usages of application software (word processors, spreadsheets, presentation tools) and E-mail, how to make Web pages, computer ethics, security, and search of the Internet. The second part provides key concepts of computer programming and essentials of the C programming language such as variables, strings, assignments, loops, functions, arrays, etc. This enables students to obtain fundamental knowledge and skills in software development and an understanding of the concepts of algorithms.

Calculus (I . II . III . IV)

Calculus is considered to be a fundamental part of the education of all science and engineering students. In Calculus A, students will study in more detail the concepts that they may have learnt in calculus at high school. This means, studying more deeply the concepts of limit, differentiation, integration, and various relations and applications of these concepts. In Calculus B, students will continue their study of calculus covering further techniques of integration, sequences and series, properties and partial derivatives of functions of multiple variables, and some applications of these concepts. The contents of Calculus A and B will introduce students to methods and applications of calculus along with a mathematical way of thinking.

Linear Algebra (I . II . III . IV)

Knowledge of linear algebra is fundamental to almost every field of mathematics. Moreover, methods and techniques of linear algebra are widely used in engineering, physics, natural sciences, computer science, economics, and social sciences. In this course, students will learn the main concepts and methods in linear algebra. The topics we will cover include systems of linear equations, matrices and matrix operations, LU-factorization, vector spaces and subspaces, basis, orthogonality, projections, determinants, eigenvalues and eigenvectors, diagonalization, singular

value decomposition (SVD), linear transformations, and various applications.

Fundamental Physics (I ~ VIII)

This course will introduce the basic mechanics of particles, particle systems and rigid bodies, which are essential for science and engineering subjects. The course will put emphasis on understanding the physical concepts such as equations of motion, laws of conservation of energy, momentum and angular momentum, etc. It will mainly cover the following topics: 1) Newton's equation of motion; 2) Conservative forces; 3) Momentum; 4) Relativity of motion; 5) Gravitational forces; 6) Particle systems; 7) Angular momentum; and 8) Equilibrium of rigid bodies.

Basic Chemistry(I . II)

This course covers the most fundamental concepts of general chemistry as a foundation for the application of chemistry in all disciplines of science and engineering. Students do not need to have studied chemistry previously to take part in this course.

Fundamental Inorganic Chemistry(I . II)

This course covers a range of general chemistry for application in all areas of science and engineering. The topics covered are broadly the same as those covered in the Basic Chemistry for Engineering/Fundamental Inorganic Chemistry course but in more detail and with a greater emphasis on developing chemistry-related skills. Students must have passed the Basic Chemistry for Engineering/Fundamental Inorganic Chemistry course to take this course. The assessment for this course is entirely project-based.

Fundamental Organic Chemistry(I . II)

Organic chemistry is the branch of chemistry that deals with the study of structure, properties, composition, reactions and preparations of carbon-based compounds and their derivatives, better known as organic compounds. Acquiring understanding of these organic molecules is important for the comprehension of numerous and different phenomena, from biological and biochemical processes, to medicine, to the properties of materials (dyes, polymers, paints, petroleum, etc.). This course covers the fundamental principles and theories concerning organic compounds which will help the students to learn the basic concepts allowing them to have a systematic understanding of the structures, classification and reactions of organic compounds.

Introductory Biology(I . II)

Students will receive an overview of biology and the fields of study it covers, including its history and fundamental concepts. These will include cell theory, evolution, genetics, homeostasis, energy transformation, and other subjects related to the world of living organisms.

Fundamental Cell Biology(I . II)

We are made of cells, we feed on cells, and our world is made habitable by cells. Thus, we need to understand cell biology to understand ourselves; to look after our health; to take care of our food supplies; and to protect our endangered ecosystems. Cell biology is a big subject we therefore focus on providing a digestible, straightforward, and engaging account of only the essential principles of cell biology in this module. Both 'lecture system' and 'idea-based learning system' will be followed for teaching and learning this course.

Environmental Geoscience

In this course, students will gain comprehensive understanding of the physical/chemical processes and material cycles which control the structure of the atmosphere/hydrosphere/lithosphere making up the Earth. In particular, weather phenomena and heat balance at the Earth's crust related to climatic changes occurring on various timescales and feedback systems that control climatic conditions are explained in detail. Also, as well as basic knowledge about rocks and fossils, the 4.5 billion year "development" of the Earth recorded in them is explained for each age, and students deepen their understanding of the mutual interaction between life and the global environment.

Drawings on Technical Design (I. II)

As seen from modern H2A rockets, the Honshu-Shikoku Bridge, and the Tokyo Metropolitan Government Building to traditional wooden architectures such as western temple precinct of Horyu-ji, all of these three-dimensional objects were built on the basis of information presented on two-dimensional design drawings. For students who may be involved in the design of these kinds of objects in the future, the ability to represent three-dimensional objects as graphics on two-dimensional surfaces and, conversely, the ability to understand and analyze objects three-dimensionally from drawn graphics, are obviously fundamental skills to be learnt. The aim of this course is for students to acquire these skills through lectures and exercises.

In the first half of the course, taking points and straight lines/planes/solids as examples, students learn the concept of projection and the rules of orthographic representation, which are fundamental to graphic representation and analysis. In the second half, as well as applications of the contents learned in the first half such as cutting, intersection and development of solids, etc., students learn projection methods other than orthographic representation (axonometrical projection, oblique projection, indexed projection, perspective projection, shadow) as considered necessary by the relevant departments.

• **Cybersecurity**

Primary Course of Cyber Security – How to Survive the Cyber

Understanding of Cybersecurity becomes important according to deployments of Internet and ICT. The area of Cyberspace is spread to off-line when you do not use Internet on-line but just carry your personal computer and USB memory or use ATM of the bank. In those situations, a law for Cybersecurity has been enforced by Japanese government and education for Cybersecurity in university and personal efforts for improvements of the literacy for Cybersecurity become mandatory. During this lecture, students can study for whole primary Cybersecurity matters include basic technologies, laws and morals about Cybersecurity.

• **Subject for Health and Sports Science**

Laboratory of Health and Sports Science

This course introduces students to ways of dealing with diseases originated from life habits, in

particular sedentary life, as well as with mental disorders resulting from various forms of stress. The course also introduces students to find ways of improving communication skills through sports activities. The goals are (1) to learn and understand effective ways of coping against diseases originated from life habits and mental disorders; (2) to learn manners and etiquette for enjoying sports activities and entertainments in life; and (3) to learn how to improve communications and relationships with others through sports activities. To attain these goals, the course offers students (a) ways of measuring their own physical fitness; (b) appropriate training methods to improve physical fitness; and (c) lectures for understanding physiological and/or psychological backgrounds behind physical fitness and training methods.

*Note: These course descriptions only concern KIKAN Education period (first year and a half). Students should contact their respective school for the upper division of their study (following the first year and a half).