

# Faculty of Symbiotic Systems Science

## Admissions policy

### [Ideal student]

A student who is interested in people, manufacturing, management, nature or the environment and who is concerned with the issues that face humanity.



## Goals of Learning

### Exploring the Science and Technology of Symbiosis

Superseding **the boundaries of humanities or science and technology, creating a sustainable and recycling society built on self-motivated** discoveries.

*Symbiosis of people, industry and environment; a cross-disciplinary angle on a new breed of science and technology education*

The Faculty of Symbiotic Systems Science was established in October 2004, with the aim of developing human resources with the requisite knowledge and executive qualities to deal with 21st century issues such as the ageing society, the global environment, and energy crisis; and contributing to the creation of a sustainable and recycling society where people can live in safety. This cross-disciplinary department is the newest science and technology field within the national university system. Our three-pronged approach of people, industry and environment handles issues that were not dealt with sufficiently in a vertically segmented academic system. This approach is how we are vastly different from most science and technology departments.

*A broad education which integrates humanities and sciences to select a major that interests you*

Students are admitted into the entire faculty not into specific majors. In the first year, students gain a wide breadth of knowledge from subjects in the humanities as well as science & technology, while learning in detail about the three majors: *Human Support System, Industrial System and Environmental System Management*. Students select a major that interests them and learn within the major starting in the second year, acquiring a sound skill base through practical experience and training. Students who have a clear idea about their field of interest at the time of admission may consult with teaching staff

directly during the first year of study. Our high level of flexibility and proximity to teaching staff are features that are only possible in a small-scale university such as ours.

*Self-directed discovery leads to more sophisticated research*

The Faculty of Symbiotic Systems Science employs teaching staff from a wide range of disciplines including engineering, science, medicine and psychology. We sincerely hope that students will accumulate self-directed discoveries from a broader perspective than a paradigm that segregates the humanities from the sciences. As you deepen your knowledge you will come across some concepts that are beyond your comprehension. These junctures are an opportunity for growth. Instead of giving up on the concept, identify what it is that you do not understand and discuss this with the teaching staff. Our staff will actively guide you to an understanding of the concept. *Science* can be described as a methodology that connects small discoveries to lead to more significant discoveries. Research areas in the Faculty of Symbiotic Systems Science include a number of areas that may contribute to reconstruction following an earthquake disaster. Medical industry agglomeration, renewable energy and environmental conservation, which encompasses radioactive material disposal, are some examples. Our graduate school is developing a PhD program that will commence in spring 2013. Cutting edge research programs, state of the art educational facilities and collaborative research with external researchers come together in this faculty where we are striving for a more sophisticated research output.

## Overview of the Faculty



### About the Faculty of Symbiotic Systems Science

**We develop people who are educated in a wide array of sciences and technologies that can solve the myriad issues we will face in the 21st century using new methods.**

The traditional mode of single subject knowledge and techniques alone cannot deal with the challenges facing science and technology today. Conservation of the global environment or functionality support for disabled people requires a multilateral approach. At the Faculty of Symbiotic Systems Science, we integrate the humanities with the sciences, and research and teaching is carried out from a triple major perspective of the symbiosis of people, industry and environment. In the *Human Support System* major, our aim is to develop support systems for human sensory and movement functions by using information and electronic technology. In the *Industrial System* major, the focus is not on mass-production and mass-consumption, but on researching resource conservation, and sustainable and recycling-oriented industry systems. Finally, in the *Environmental System Management* major, we research and analyze the impact of human activity and the workings of our society on the environment with the aim of solving various environmental issues surrounding systems in nature. Our faculty is best suited to students who want to learn a broad array of sciences and technologies and grapple with new ideas.

#### Qualifications that can be acquired

##### Teaching certification

- **Junior high school teaching certificate**  
(science / technology / mathematics\*)
- **High school teaching certificate**  
(science / technology / information)

\*Student is required to obtain units from other faculties to qualify for this certificate.

#### Assistance for various accreditation tests

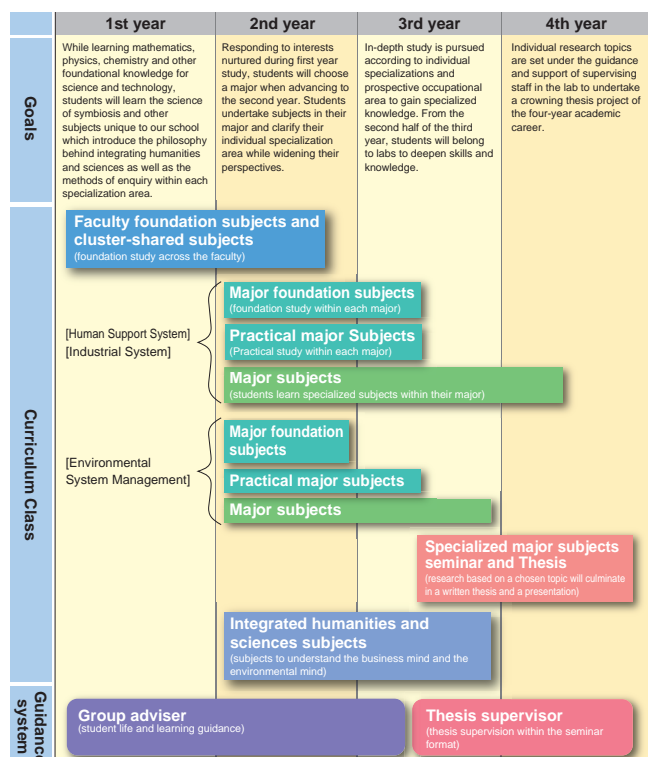
If course units obtained from the Faculty of Symbiotic Systems Science lead you to a pass in one of the certification examinations below, the faculty will assist you in paying the entire test fee for one exam sitting.

- **Information-Technology Engineers Examination**
- **Test in Practical English Proficiency**
- **TOEIC®**
- **TOEFL®**

### Curriculum Features

The main focus at the Faculty of Symbiotic Systems Science is *an education that emphasizes foundations, sets individual goals and engages in problem solving; an integrative education that fosters students with a broad perspective; an education with global qualities that will enable students to contribute internationally; and a practical education that gives students concrete skills.* There are five specialization domains; *Foundation Subjects, Major Subjects (Lecture Subjects and Integrated Humanities and Sciences Subjects), Free Elective Subjects, Practicum Classes and Thesis.* While there are required basic units for each domain, we have extended our range of elective subjects as far as possible and provide detailed academic guidance to accommodate the varied academic needs of each student.

### Curriculum and support system



## Obtaining specialized education

Within the specialization areas of the Faculty of Symbiotic Systems Science, there are *cluster-shared subjects*, *faculty foundation subjects* and *major foundation subjects* which provide introductory and foundational knowledge on human understanding, industry and environmental science. Further study in *practical major subjects* and *specialized major subjects* provides specialization for career building at the bachelor level. Integrated humanities and sciences curricula are offered at the specialized education level in other faculties as well.

### ■ Faculty Foundation Subjects

- **Faculty Foundation Subjects A:** Physics I (Dynamics), Chemistry I (Basic Chemistry), Foundation of Laboratory Science Faculty
  - **Faculty Foundation Subjects B:** Foundation of Mathematics, \*Analysis I
  - **Faculty Foundation Subjects C:** Foundation Geometry, Linear Algebra
  - **Faculty Foundation Subjects D:** Earth Science, Biology, Foundation of Computer Programming
  - **Faculty Foundation Subjects E:** \*Analysis II, Probability and Statistics, Physics II (Electromagnetism), Physics III (Thermodynamics), Chemistry II (Physical Chemistry)
- \*Shared Subject with the Faculty of Human Development and Culture

### ■ Cluster-Shared Subjects

Science of Symbiosis / Overview of Human Support System / Overview of Industrial System / Overview of Environmental System Management

### Science of Symbiosis (First Year)

The aim in this lecture subject is to alter and develop the knowledge gained in high school from an exam oriented skill set to one that is useful for studying *symbiotic systems science*. In concrete terms, this subject confirms basic concepts in mathematics, physics and related areas for a deeper understanding of the significance of modern science.



### Global Environment Science Experiment (Second Year)

This image shows the observation of volcanic geomorphology and fumes at Mount Azuma-kofuji. Emphasis is placed on understanding nature through observation outdoors. Students learn about local geology, underground geology of plains and basins, observation of atmospheric activity and phenomena surrounding the diffusion of materials.



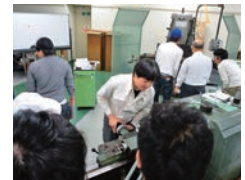
### Industrial System Experiment (Second Year)

This subject carries out practicum and experiments along four themes: *manufacturing rubber with magnetic components*, *assembly system design*, *plastic synthesis*, and *product development*, *product design and marketing*.



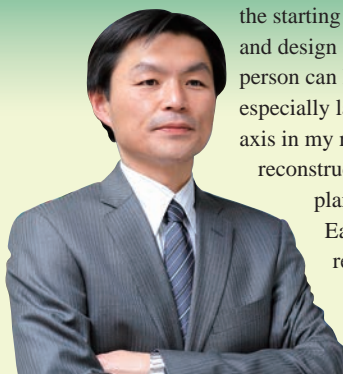
### CAD/CAM Practice (Third Year)

In order to bring your own ideas into reality, designs must satisfy a variety of different conditions. Through this lecture subject, students will understand design, drawing and production methods and put this understanding into practice using computers and machine tools.



### Research Introduction

## Planning and designing a place



My specialty is urban design and community building. I believe the starting point for urban design and community building is to plan and design a place using an extensive time axis that shows how each person can lead a more enriching lifestyle. Urban planning systems, especially land utilization planning systems, have been the main axis in my research, which has encompassed urban and regional reconstruction, inner city revitalization, urban planning litigation, planning theory and American urban planning. After the Great

East Japan Earthquake, my interests have expanded to include decontamination and tourism. My research themes cover a mix of interests these days, but urban design and community building is fundamentally a research area that encompasses the entirety of a city, town or village, or in other words, the entirety of our lifestyle and activities. Even if a topic may seem incongruous, if it is necessary, I think it is important to have the gumption to include and tackle such research



Visit to Germany to study its advanced utilization of renewable energy in 2012

**Major in Environmental System Management Urban Design Lab**  
**Associate Professor Kota Kawasaki**

Professor Kawasaki graduated from the Faculty of Education at Shinshu University with a major in Junior High School English in 1993. He then moved on to the Graduate School of Education at the same university to gain a Master of Education with a Pedagogy Major in 1995. He completed his PhD in Engineering from the Graduate School of Systems and Information Engineering at the University of Tsukuba in 2008 (Doctor of Engineering). From 1995 to 2010, Professor Kawasaki was an urban design consultant, engaged in research, planning and projects related to urban planning and community building throughout Japan. He has worked at the University of Fukushima since October 2010.

topics. In Fukushima, many people have lost their homes and many areas suffered significant damage, both physical and imagined. There are a multitude of activities underway towards rebuilding Fukushima, but rather than government initiatives, true reconstruction of Fukushima requires the residents of each place to bring their own vision into practice and engage in the reconstruction process.