日本芝浦工业大学

Sandwich Program 招生简章

2024 年春季入学

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*此招生简章为指定校推荐生用。

日本芝浦工业大学

Sandwich Program 招生简章 2024 年 4 月入学

一、项目概况

(一) 大学介绍

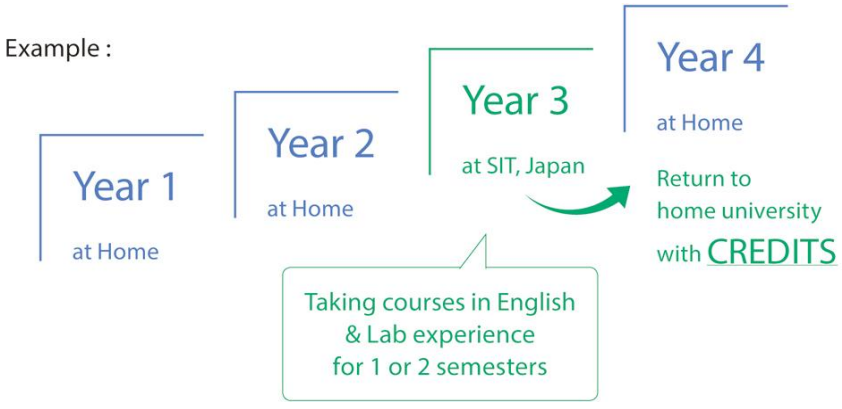
芝浦工业大学简称芝浦工业大，芝浦工大。东京私立理工科四大名校之首，与东京工业大学，早稻田大学，东京理科大学，九州大学等 9 所学校为 MOT 联合学校，是日本科学与科技领域方面最顶尖的学府之一。芝浦工业大学前身是 1927 年设立的东京高等工商学校，现在的芝浦工业大学于 1949 年设置。 是被大学基准协会认定的 34 所国公私立大学之一。

芝浦工业大学以“坚持实学主义，从社会中学习，为社会做贡献”为建学精神，在全球化的社会中致力于培养能够活跃在世界舞台上的技术性人才。

(二) 项目介绍

Sandwich Program is where the student continues to be registered at their home university, while studying for a period of time between six months and a year at Shibaura Institute of Technology. For example, the student may study for their first two years at their home university, study at the College of Engineering at Shibaura Institute of Technology for the third year, and then complete their studies at their home universities. Students have a wide range of study options, from 17 departments and 3 colleges. Classes are taught in English, and Japanese language lessons are also available.

（该项目是学生保留国内学籍身份，同时在芝浦工业大学学习六个月至一年的时间。例如，学生可以在其国内大学学习前两年，在芝浦工业大学的工程学院学习第三年，然后在其原大学最终完成学业。项目学生有我校 17 个系和 3 个学院的广泛的课程选择。课程以英语授课，同时提供日语课程。）



二、学术课程

(一) 学期时段

- 半年课程 ：2024 年 4 月中旬—2024 年 7 月下旬
- 一年课程 ：2024 年 4 月中旬—2025 年 1 月下旬
- *说明：学期时间参考去年数据，具体按照学校实际安排为准，寒暑假期间及短期假期根据校历安排为准。

(二) 入学手续

从报名至顺利获得签证、宿舍申请等所有手续由报名中心指导完成。入学后学生学籍属芝浦工业大学国际部，学生证办理、课程选择等由芝浦工业大学国际部指导完成。

(三) 课程内容

项目参加学生可以选择包括机械理工学，材料工学，电器电子信息学，通讯工学，日语，计算机，建筑，环境等 17 个领域各种课程。※具体科目请参考 2023 全年的选课课表附件：

1. Undergraduate Level

   春季学期 http://timetable.sic.shibaura-it.ac.jp/table/2023/Timetable8X0318Z1.html

   秋季学期 http://timetable.sic.shibaura-it.ac.jp/table/2023/Timetable8X0328Z1.html

2. Graduate Level

   春季学期 http://timetable.sic.shibaura-it.ac.jp/table/2023/Timetable8X0318Z5.html

   秋季学期 http://timetable.sic.shibaura-it.ac.jp/table/2023/Timetable8X0328Z5.html

(四) 学分规定

1. 没有特定的上限要求，但是每周的上课时间最低需要超过 10 个小时；
2. 每周 6 堂课，12 个学分。

三、留学生活

(一) 宿舍安排

合格发表后，宿舍申请指南将发送给合格者，指导办理宿舍申请手续，签订宿舍入住协议，支付宿舍相关费用，费用以当年实际通知为准。

(二) 学生待遇

1. 校园待遇

项目参加学生可使用包括芝浦工业大学图书馆、校园网络、食堂以及其他相关教学设施。

2. 交通

项目参加学生可持芝浦工业大学学生证购买学生票。

3. 关于勤工俭学

项目参加学生持【留学】签证，各项手续完备后，可申请【资格外活动许可】，进行不高于 28 小时/周的勤工俭学，获得合法收入。但勤工俭学只应作为社会实践和课堂学习的补充，所获收入不建议列入留学资金计划。

4. 关于奖学金

芝浦工业大学可以为通过奖学金筛选的学生提供每月 4 万日元的奖学金，由学校决定奖学金的获得者。

更多关于奖学金的资讯：

https://www.shibaura-it.ac.jp/campus_life/tuition_scholarship/scholarship.html

四、报名须知

(一) 申请条件

1. 指定校正规在校学生
2. 英语成绩：CET6 级以上或 TOEFL iBT80 或具有同等以上水平
3. 在校期间未受处分且成绩优异、品行端正的学生
4. 经合作院校推荐，准予赴日交换留学并可获得学分承认的学生。

(二) 报名截至：2023 年 10 月 24 日

(三) 合格发表：2023 年 12 月中旬（暂定）

(四) 项目费用

1. 课程费用

选考费（报名时）/Registration Fee : JPY30,000

准入费（合格后）/Admission Fee : JPY40,000

- 学费/Tuition : JPY15,000 per credit

*以上费用参考 2022 年数据，根据每年的情况有微调的可能性，具体以大学公布的当年信息为准。

2. 项目参加费

- 半年课程:302,500 日币
- 一年课程: 363,000 日币

3. 项目参加费明细

1) 费用包含：课程申请指导费、签证指导费、日本现地服务费、指定日接机费、宿舍安置费、部分课外活动补助费用；

2) 费用不含：国际机票费、日本签证费、在日住宿费、个人消费及以上“包含”中没有涵盖的内容。

4. 各项费用需在规定时限之前汇入指定账户，并提供汇款凭证。

(五) 报名流程

1. 提交报名表至学校相关部门老师处。
2. 报名审核通过后缴付项目参加费。
3. 准备相应申请材料（具体材料将由负责老师另行通知）
4. 合格发表
5. 宿舍申请并交纳宿舍费用、准备在留材料
6. 在留下达
7. 签证办理
8. 出发

五、联系方式

(一) 关于报考、签证手续及日本留学生活指导，请通过以下方式咨询：

咨询邮箱：duanqi@xf-world.org
咨询电话：施老师，18721997405 （微信同号） / 陈老师，13162502532（微信同号）
报名链接：apply.xf-world.org

(二) 关于项目构成以及学习内容请咨询

Division of Global Initiatives

地址:3-7-5 Toyosu, Koto-ku, Tokyo 135-8548, Japan (2F Classroom and Administration Building Toyosu campus)

电话:+81-(0)3-5859-7140（英语和日语专线）

传真:+81-(0)3-5859-7141

邮箱: global-admission@ow.shibaura-it.ac.jp

(三) 关于院校推荐名额请咨询各指定校外事处，或学校指定部门。

六、宣讲会信息

主题：2024 年春季入学-芝浦工业大学 Sandwish 项目宣讲会

时间：2023 年 9 月 20 日 12:30 下午 北京，上海

平台： Zoom 会议

会议号：309 388 2159

密码：654321

附件：可选课程介绍

Course title	Course description	Purpose of class	Goals and objectives
Accessibility of Information and Communication	**This course may be cancelled according to COVID-19 situation, as field works, case studies, and simulated experiences will be undertaken in this course. Disparities in information access between persons who can access information easily and persons who can not causes not only whether you have it but also economical disadvantage and social limitation. All people have equal rights to communicate with each other where "communication" has a big meaning toward in information society. However, as for the reality, a technical and/or a social problem block it. In late years, may efforts for this problem advances in global communities – European, North American, and Asian countries. In many fields including an industry or the construction business, this issue attracts attention rapidly. Therefore, this issue becomes an important topic for students who are looking for jobs in industrial field. In this class, we argue this social issues through simulated experience as persons with disabilities,	Understanding why "information accessibility" is becoming more important in modern society through discussion, field works, case studies, and simulated experience.	1. To understand disparities between "information haves" and "information have-nots" 2. To understand concepts of universal design, barrier-free, and accessibility in information 3. To understand "accessibility" in terms of not only technical model but social and human rights model

	field works, and case studies.		
Acoustic Systems	Sounds penetrates deeply into our daily life, for example, conversation, music and so on. The topics of the class are the estimation of the sound emission, the design principle of the electroacoustic transducer and the sense of hearing. Finally, you practice to calculate frequency characteristics by finite element method and digital signal processing.	The class aims to be able to understand the estimation of the sound emission, the design principle of the electroacoustic transducer and the sense of hearing. Finally, you practice to calculate frequency characteristics by finite element method and digital signal processing.	1. Be able to understand propagation sound and to calculate sound field. 2. Be able to understand operation of electro-acoustic systems and to design the systems. 3. Be able to understand sense of hearing, acoustic parameters and employed unit in acoustics. 4. Be able to understand sense of hearing, acoustic parameters and employed unit in acoustics. 5. Be able to design sound field using finite element analysis.
Advanced Bioscience	This course further extends the coverage of genetics concept in the Bioscience course. The course is intended for students interested in gaining further knowledge in four major areas of Genetics, Microbiology. Molecular Biology and Biochemistry	To understand the advance concepts of Genetics, Microbiology. Molecular Biology and Biochemistry	1. Define the concept of genes and their function in relation to genomics. 2. Analyze the evolution processes at the molecular level. 3. Understand technics used in modern biotechnology.
Applied Economics (Japanese)	The purpose of this course is to help students master a quantitative analytical method and analyze the economic phenomenon that students feel involved in. The course also introduces the input-output analysis and the macroeconometric model analysis to estimate a positive economic effect stemming from economic	Students are expected to acquire statistical and econometric methods, and analyze various kinds of economic phenomena.	1. Acquire an analytical method of statistics and econometrics, and apply them to analyze the actual economy. 2. Acquire an analytical method to estimate economic effects. 3. Learn regression analysis. 4. Be able to use an analytical method that one sets a hypothesis and then tests it

	policies such as fiscal policy. At the end of the course, students will hand in the final paper.		quantitatively.
Applied Mathematics (Japanese(English accepted)) (Prerequisites: You are expected to be capable of programming (coding) using one of any software.)	In terms of technical calculation such as electrical circuit analysis, it may be impossible to obtain solution directly from algebraic or differential equations. Therefore, we have to employ computer-based numerical analysis. This subject offers how to use numerical calculation software, solving method of nonlinear equation, numerical integration method, and these applications for electrical calculations.	*	1. Possible to conduct calculation using a numerical calculation software. 2. Possible to explain purpose and solving method of nonlinear equations. 3. Possible to explain purpose and solving method of differential equations. 4. Possible to apply these method to electrical calculation to obtain solutions.
Applied Mathematics (Prerequisites: Basic knowledge of linear algebra and analysis)	Discrete Fourier transform (DFT) is used for processing sounds and graphics in digital computers. This lecture aims at being able to do Fourier series expansion, which forms the basis for DFT. As an introduction to Fourier series expansion we illustrate the least-square method and the orthogonal function expansion. Fourier series expansion is an instance of the orthogonal function expansion. Understanding Fourier series expansion forms the basis for understanding Fourier transform and DFT, which are topics covered in lectures of signal processing.	By learning the least-square method, the orthogonal function expansion, and Fourier series expansion, we acquire the basics for processing signals like sounds and images.	1. Understanding the least-square method and being able to approximate given sequences of data or functions by linear functions or quadratic functions. 2. Understanding orthogonal functions and being able to do the orthogonal function expansion for given functions by some given set of orthogonal functions. 3. Understanding Gram-Schmidt orthogonalisation, which is a method (algorithm) for orthogonalising a set of vectors in an inner product space, and being able to construct an orthogonal set of functions from a given set of functions. 4. Being able to do Fourier series expansion, which is an

			important instance of the orthogonal function expansion.
Architectural Design Studio (Japanese(English accepted))	The course is an architectural design studio, in which students are to propose a building design in urban context. After a thorough research on the several aspects of built environment in the scale of city planning (e.g. 1: 2,500), students are to propose suitable programs for the building and to develop the urban and architectural design in the scale of regional planning (e.g. 1:500), and/or the scale of architectural design (e.g. 1:200). The class is for International Course Students as well as Foreign Students.	The students are expected to learn the situation of the contemporary urban context through research and to acquire the professional knowledge and techniques necessary to make a convincing proposal to improve the architectural and urban conditions.	1. To be able to read and use the drawings at appropriate scale to convey urban, architecture and landscape concepts. 2. To be able to make a proposal based on logical design approach. 3. To be able to present one's own ideas through various visual means (drawings, models, etc.). 4. To be able to understand and make comments to the other students' works.
Architectural Planning and Design	In this course, students will learn about architecture through the following process: - Lectures on the architectural forms and the analytical methods according to the different building types. - Analysis on Plan Composition and Circulation, etc. - Finding Patterns for Architectural Form - Presentations of findings and Discussions Through this process, students should acquire the professional skill to read and understand architectural	The aim of the course is for students to study various architectural forms and the cultural, functional and structural meanings behind them through analyses and categorization of different architecture, so that they should acquire the architectural language, which is useful for the practice of planning and design.	1. To be able to make diagrams to show the relationship between architectural forms and spaces. 2. To be able to develop the skill to read architectural documents and to explain the knowledge on how architecture is planned and designed. 3. To be able to present the analysis of architecture from various points of view and to exchange the ideas with other students in English.

	documents, as well as deepen their understanding of the relationship between the architectural forms and their functions and meanings. The accumulation of this knowledge should contribute to the design skill. Also, students should learn diverse perspectives on architecture through sharing the findings with the classmates by presentations and discussions. This class is designated as a prerequisite course (Architectural Planning) to take Architect Registration Exam in Japan.		
Assistive Technology	*	*	*
Automotive Engineering	The number of components of a car extends several tens of thousands points and related fields are from the thermodynamics of engine to computers such as ECU and a radar. The instructor lectures, for the purpose of understanding this, the overall picture of the modern cars. In addition, materials, production technologies and future cars are described.	-Understand of automotive technologies from the thermodynamics of engine to computers such as ECU and a radar, materials, production. -Acquire the ability to investigate the details of car -Acquire the ability to discuss the purchasing targets of production car.	1. Understand the basics of automotive engineering. 2. Acquire the ability to investigate the details of car. 3. Acquire the ability to discuss the purchasing targets of production car.
Biomedical Measurements	Measurements of biological structures and functions are necessary in order to understand biological phenomena and life activities. Various sensors and equipment are used in the biomedical measurements, and	Deepen their knowledge on biological characteristics and measurement principle in order to utilize the biological measurement technologies.	1. Be able to explain the basic concepts of biological phenomena and measurements. 2. Be able to explain the working principles of sensors and measurement equipment. 3. Be able to analyze the principles and applications

	understanding of their principles and measuring objects is important if we want to utilize them. This course deals with basic concepts and principles of biomedical measurements through lectures and some simple experiments. In the latter part of this course, students analyse a biomedical measurement technology or medical equipment in small groups. Following group consultations, they are required to present their findings.		of a biomedical measurements on their initiative.
Biosensors	Biosensor is a highly sensitive and specific sensor created by mimicking the mechanism of living organisms to receive and recognize external physical and chemical signals (sense).	This course presents the molecular mechanisms of senses and also describes the principle of biosensor to detect and quantify a certain molecule. Biosensor recognizes the molecule by the detector element consisting of materials such as enzymes, antibodies, nucleic acids and cells, and the physicochemical change on the elements is transduced to electronic signal. We also present the application of biosensor to medicine, chemical engineering and the assessment of environments.	1. Comprehension for fundamental of biomaterials and biosystems 2. Comprehension for concept of biosensors 3. Comprehension for application of biosensors
Calculus with Differential Equations	You will learn what a differential equation is and how to recognize some of the basic different types. You will learn how to apply some common techniques used to obtain general solutions of differential equations and how to fit initial or boundary conditions to obtain a unique	The purpose of this class is to learn how to recognize some of the basic different types of differential equations, to learn how to apply some common techniques used to obtain solutions of differential equations and to appreciate how differential equations arise in applications. This class also	1. You can describe how to recognize some of the basic different types of differential equations. 2. You can describe how to apply some common techniques used to obtain solutions of differential equations. 3. You can describe how differential equations arise

	solution. You will appreciate how differential equations arise in applications and you will gain some experience in applying your knowledge to model a number of engineering problems using differential equations.	includes a review on the content learned in the class of differential equations at the time of first grade.	in applications.
Chemical Spectroscopy	Chemical spectroscopy provides you solid knowledge and exercises about spectroscopy. Spectroscopy is a practical and contemporary way of analytical chemistry. The applications of spectroscopy are used not only in industry but in medical, pharmaceutical, food and environmental duty. You will study about the principle of spectroscopy as a way of structural and quantitative analysis of the compounds.	Understanding for the principle and usage of spectroscopy in quantitative and structural analysis of chemicals.	1. Understand the principle of absorption spectroscopy. 2. Understand the principle of quantitative analysis of the chemical by spectroscopy. 3. Understand the way to analyze the structure of the chemical by spectroscopy.
Color Theory	Color is an essential aspect for practical design. This course teaches color theory for designing. The goal of the course is to enable students to handle colorants, paints and computer colors by understanding color theory and experiencing visual perceptions. First part of the course, ocular systems, optics, color naming, color order systems and harmony will be taught. Then the latter part, color psychology, printing, web design, color management, environmental design, and color culture will be emphasized. This course	In this course, we aim to learn basic principle of color theory. In addition, we also aim to attain the ability to apply color in prospective practical designing based on theoretical knowledge.	1. Being able to observe color as a design aspect. 2. Being able to understand psychological characteristics of color. 3. Being able to understand functions of color communication.

	delves into functions of color communication via practical graphic, product, architecture, and space design.		
Combustion Engineering	In this lecture, the fundamentals of the combustion phenomena are discussed.	Combustion is an important method for obtaining energy of heat or power in our life. Combustion is a complex phenomenon including heat and mass transfer, fluid dynamics, and chemical reactions. In recent years, it has become possible to predict combustion phenomena by numerical simulation. However, there still remain lots of problems to solve. The purpose of the class is to understand the fundamentals of the combustion phenomena.	1. To deepen the knowledge of fuels. 2. To understand the fundamentals of the combustion phenomenon. 3. To understand combustion diagnostics.
Computer Simulation	This course introduces the fundamental and practical concepts of computer simulation as well as how to use MATLAB tool for handling and analyzing the simulation data. The topics include MATLAB programming, queue theory, etc. Assignments require an understanding of network problems and MATLAB programming.	Students get familiar with MATLAB tool and obtain the ability to simulate and analyze the simulation result by using typical simulation technique.	1. Understanding the fundamental concepts of computer simulation. 2. Understanding how to conduct a practical simulation to solve an engineering problem using MATLAB. 3. Understanding how to handle and analyze the data.
Electric Circuits 2	This course provides a basic study on fundamentals on analysis of electric circuit. The course will be given in the form of lectures and exercises to help the students have a better understanding and proficiency in analyzing electric circuit.	Learning the overall knowledge to have the child who asks the voltage and an electric current using loop circuit equation, nodal equation of equilibrium and a law to various electric circuits.	1. The students will be able to understand the characteristics of resonant circuit. 2. The students will be able to proficiently use loop equation and node equation in various electric circuits analysis. 3. The students will be able to understand general circuit theorem.

			4. The students will be able to analyze 2-port circuits.
Electric Railway	Railway in Japan is well-developed. This class focuses on mainly electricrailway techlogy.	The purpose of this study is to understand electrical engineering technologies.	1. Possible to explain development history of electric railway. 2. Possible to explain power supply system of electric railway. 3. Possible to explain electric car structure of electric railway. 4. Possible to explain development operation management technology of electric railway. 5. Possible to explain latest trend of electric railway.
Electrochemistry of Metals (Japanese(English accepted))	At this lecture, a technical or scientific matter required for a surface treatment is explained, and a lecture is given about the foundation and technological application of a surface treatment method.	The purpose of this lecture is to study dry process and wet process in a systematic way.	1. Understanding of Surface Treatments 2. Understanding of Surface Treatment Methods and its Applications 3. Understanding of the Importance and the Necessity for Surface Treatment Technology in Material Engineering
Engineering Mathematics	This course will cover how calculus, Fourier analysis, and other formulas are applied in the field of information and communications engineering. Engineering mathematics is crucial to understand the transmission of information in the field of radio and acoustic wave engineering. Therefore, engineering mathematics will be focused more in class. We will provide the students with as many tasks as possible throughout the course, in order to have	1. Engineering mathematics for radio engineering. Understand how calculus is applied in radio engineering. That includes reviewing the electromagnetic phenomenon that can be expressed by calculus and gaining its functional equation. Then this will be followed by learning the general engineering techniques that are needed to solve the functional equation. 2. Engineering mathematics for acoustic wave engineering. Understand how Fourier analysis is applied in this field.	1. Understand that electromagnetic phenomenon, which can be expressed by calculus, can be transformed into a functional equation. 2. Gain general engineering techniques that can solve the functional equations. 3. Understand and explain terms used in spectral analysis. 4. Solve basic spectral analysis practice questions.

	a better understanding of this topic.	Students will be able to understand and explain the terms used in spectral analysis, followed by solving some basic spectral analysis practice questions.	
Environmental Research Seminar 1	Students will conduct environmental research in English under the supervision of one of a faculty member of the Department of Architecture and Environment Systems.	Through an appropriate research procedure, students will write a research report and make a presentation in English about the subject selected from the field of environmental studies including architectural studies, urban studies, and social studies.	1. Students will set a precise research subject. 2. Students will conduct research through an appropriate procedure for the subject. 3. Students will write a research report and make a presentation in English.
Environmentally Sustainable Engineering	"Sustainable Development Target (SDGs)" was adopted at the international summit of September 2015. Toward a sustainable society, companies as well as the state are required to initiate aggressive behavior with corporate social responsibility. In this lecture, we aim to learn how companies are taking SDGs, what kind of actions and technologies are required for achieving the goals based on an engineering viewpoint.	In this lecture, we aim to learn how companies are taking SDGs, what kind of actions and technologies are required for achieving the goals based on an engineering viewpoint.	1. Students can learn basic knowledge on international framework and efforts on sustainability. 2. Students can learn business activities based on engineering grounds. 3. Students can think and propose what companies should do toward a sustainable society.
Exercise in Architectural Studio 4 (Japanese)	"Design assignment exercises (hand-drawn + CAD). In order to apply and master the skills acquired in the first semester of "Architectural Studio Seminar 3" to more advanced architectural design, two design assignments are performed (office architecture, student hall). Both design objects will be	Design medium- to large-scale facilities (offices, student halls). In the second half of the third year, individual design guidance is provided with the aim of being able to design results equivalent to graduation designs at other universities. "	1. Can design medium- to large-scale facilities (non-residential and non-wooden). 2. Demonstrates modeling, design, and conceptual capabilities from structural planning to equipment planning. 3. Continue to improve the skills of drawing ability, modeling ability, spatial

	non-residential, RC-built, and 3,000-5,000 m2-class facilities, and will be developed from design objects (non-residential, RC-built, total 1000-1600m2 class) in the second half of the second year. Students conduct seminars in a way that is close to one-on-one instruction by individual instruction by teachers, and work on individual work tasks from the conception stage to the study stage and the presentation of the final draft. We will improve the specific skills (drawing ability, modeling ability, spatial grasping ability, and diagramting ability) in the department of architecture. "		grasping ability, and diagramting ability. 4. Be able to explain the space you are envisioning in a language, diagram, etc. 5. Investigates and discusses prior cases and references.
Exercise in Space and Architecture Design 4	*The schedule and the detail of the program in 2020 cannot be fixed because of the coronavirus outbreak in the world. All students who wish to take this course must contact Professor Minami before the spring semester starts by email (ASAP). Please check the official website of SIT regarding the first date of 2020 spring semester, which has been currently postponed till May 11th, 2020. All SIT faciilities are closed during the days when the Japan's government declares the state of emergency in Tokyo. In the first quarter of the	Understand the social problems in our society and propose the solutions for it by the architectural design. You are encouraging to design the urban space and landscape in adjoining environment. By integrating your knowledge in structure, material and mechanical engineering to control our living environment, you are expected to design a cultural complex in the urban context of Tokyo.	1. Understand the purpose and function of public facility. 2. Understand the relationship of public facilities with local community. 3. Understand the city planning of the area and propose the future of the local community. 4. Propose the design based on the needs of the users of the public facility. 5. Acquire the skills of architectural presentation including computer graphics and modeling.

	semester, you are expected to design a new Fukagawa library. https://www.koto-lib.tokyo.jp/023_lib_fuka.html You may design a completely NEW library on the same site or add some annex building and renovate the exiting one. If you think it is necessary, you can move the site for the new library to the different place. You are expected to design the most reasonable and attractive library for the local people. One of the important issue is how to well connect the library with adjoining Kiyosumi Park and Kiyosumi Garden. http://www.tokyo-park.or.jp/park/format/index033.html#googtrans(en) In the second quarter of the semester, you are expected to design a museum in Ueno Park.		
Exercise in Urban and Regional Design (Japanese)	This course requires students to understand changing contemporary urban society through the fieldwork and propose the desirable district plan and architecture to sustain local community. Students will obtain skills to envision a desirable future community and propose district plan and architecture.	-To discover issues about local community. -To obtain skills to envision a desirable future community and propose district plan and architecture.	1. To have better observation skills to understand contemporary social issues. 2. To collect appropriate data and to grasp current situation through the data analysis. 3. To obtain visions to create better future community. 4. To present the concrete proposal of plan and architecture for local community and process to realize them. 5. To have better skills of

			presentation to communicate with local citizen.
Exercise in Urban Architecture Design 4 (Japanese)	Exercises on design issues. In order to apply the skills learned in "Urban architectural design exercise 3" in the latter part of the second year to more sophisticated urban architecture, design a number of design issues. The first quarter is dwellings with RC construction and total surface of 3000 to 5000 m 2, and it keeps continuity from the design object of the second year (public, RC construction, asurface of 1000 ~ 1600 m 2). In the 2nd quarter, it corresponds with 5 programs of the public and the private. Students are divided into about 20 persons each group and are instructed by one faculty member and students will skill up their skills (drawing ability, modeling ability, spatial grasping ability, graphicizing ability) in the Department of Architecture. Also, at the time of submitting tasks, carefully conduct the final review committee and also communicate design ethics.	(The first quarter) Students learn from design of dwelling unit, way of gathering, relationship with urban area and design the dwellings which are important elements of urban landscape. (The 2nd quarter) Students understand diverse programs on urban and architecture, master the architectural design while reading the context of the surrounding environment.	1. Learn the design skills of public and medium-sized facilities. 2. Understand management concepts specialized in architecture such as VE and FM. 3. To improve drawing capacity, modeling ability, space grasping ability, diagrammatizing ability, and logic. 4. Acquire the ability to explain a project with languages, diagrams, etc. 5. Acquire survey ability and critique eyes of precedent cases and reference cases.
Hydrodynamics 1	The course is compulsory for the second year students at the department of mechanical engineering. In this lecture, the students will learn the fundamentals of fluid mechanics. The lecture consists of basic properties	1. To learn the basic knowledge on fluid properties (continuity, density, viscosity, and surface tension). 2. To learn the fundamentals of fluid statics (absolute/gauge pressure, manometers, Pascal's law, pressure distribution,	1. To understand the concept of fluid and to be able to explain the properties of fluid. 2. To understand the hydrostatic forces acting on a solid surface immersed in liquid and to be able to

	of fluids, static and dynamical aspects of fluids. In addition, dimensional analysis will be taught with examples.	forces acting on a solid surface immersed in liquid, buoyancy, Archimedes' principle). 3. To learn the fundamentals of fluid dynamics (different types of flows (steady/unsteady, viscous/inviscid, laminar/turbulent), stream/path/streak lines), flowrate and hydrodynamic conservation laws (continuity equation, Euler's equation of motion, Bernoulli's theorem, Torricelli's law, Pitot/ Venturi tubes, momentum theorem). 4. To learn the dimensional analysis (basic/derived quantities, Buckingham's pi-theorem, similarity parameters). 5. To learn the applications of the above concepts to fluid flow problems.	calculate them in a specific situation. 3. To understand the basic equations of the conservation laws (continuity equation, Euler's equation and Bernoulli's theorem, momentum theorem) and to be able to apply them in a specific problem. 4. To understand the concept of dimensional analysis and to be able to apply it in a specific situation.
Hydrology	This class will provide you with basic concepts of hydrology (water cycle and water resources).	The goals of this course are to - Be able to understand basic knowledge of each component in water cycle - Be able to understand and explain how to monitor and model water cycle	1. At the end of the course, participants are expected to obtain basic knowledge of water and energy cycle. 2. They are expected to understand the latest technological advancement of monitoring and modeling of hydrologic cycle. 3. They are expected to explain the latest technological advancement of monitoring and modeling of hydrologic cycle
Information Communication Technology	*	*	*
Interaction Design	Interaction design is incorporated into a product's overall design from the very beginning to optimize the	To offer a cross-disciplinary, practical, and process-oriented introduction to the field. The target students need no	1. The students can understand the basic idea of user interface, user experience, and HCI.

	product functionality and the user experience the product offers. This course offers a cross-disciplinary, practical, and process-oriented introduction to the field, showing not just what principles ought to apply to interaction design, but crucially how they can be applied. Group works, exercises, and presentations take a large part of this course.	preliminary background and can be from the various field.	2. The students can explain the principles of Interaction design 3. The students can apply the principles and frameworks to design interactive products for user experiences.
International Development Engineering	This course addresses the causes and nature of current major environmental problems from several interrelated perspectives, including scientific facts, social background, complicated relations among stakeholders, availability of technologies and systems, and international framework. A recognition of the complex of environmental problems needed to address current international development is the primary focus of this course. Students will learn the basic knowledge of major environmental problems and their measures including air pollution, water pollution, waste problems, and climate change, and comprehensive approach for sustainable development which is a fundamental concept in current international	This course objective is to acquire a basic view for understanding major environmental problems and measures in line with the concept of Sustainable Development Goals (SDGs).	1. Students can describe the complex interdisciplinary nature of the field of environmental studies, and discuss the international development in line with concept of sustainable development 2. Students can understand some basic aspects of environmental science and environmental policy as presented in class 3. Students can use fundamental skills of project management

	development, and skills of the project management, examining best mix of policies and technologies in line with the concept of sustainable development.		
Introduction of Electrical Engineering Research	This course aims to provide students with an understanding of the role of electrical engineering in real life and the future. This course consists of 4 fields, power and energy system, electrical materials and devices, information/IoT system, and robotics. This course is provided by 6 faculties from all faculty of the department of electrical engineering.	The objective of this course is to - understand and explain the basic contents of each field - understand and explain the social background and technical background of each field. - understand and explain the issues and future trends in each field.	-understand and explain the basic contents of each field -understand and explain the social background and technical background of each field. -understand and explain the issues and future trends in each field.
Introduction to Control Engineering	This course provides fundamentals of the control engineering, which is applied to various automation devices. The main topics of the class are Laplace transforms, transfer functions, transient characteristics, block diagrams and frequency characteristics.	Topics covers linear system theory; mainly responses of 1st/2nd order system, stability and frequency analyses.	1. student can solve simple differential equations applying of the Laplace transformation, and derive transfer function of the system 2. student can obtain time response for system up to 3rd order 3. student can determine stability of system 4. student can obtain frequency response and Bode diagram including physical interpretations 5. students can draw a block diagram of given system
Introduction to Electromagnetism	This is an introductory course of Electromagnetism. The characteristic of this course is that we start from Maxwell equations from the beginning and explain all	The purpose of this lecture is to understand physical phenomena of electricity, magnetism, and light in a unified theory of Maxwell.	1. Understand the notion of electromagnetic field both from qualitative and quantitative points of view. 2. Understand Maxwell equations and master how to

	phenomena of electricity and magnetism based on the equations. However, in order for the course to be introductory, we take much time for the study of stationary cases. Experimental demonstrations will also be given during the lecture.		use them. 3. Understand the force acting on a charged particle in electromagnetic field.
Introduction to Embedded Programming (International Training)	Students firstly learn three fundamental concepts for programming; variables, conditional jump, and loop processing, then, functions, arrays. In second half, memories and I/O device access techniques are introduced. On these steps, popular control board is used together for practical device controls. Finally, students are divided into groups and system using the micro-controller and I/O devices should be developed. And presentation should be processed by the members of the groups.	This course provides a basic knowledge and skill of embedded programming. Programming is now one of common skills for engineers and this also leads to a practice of logical thinking ability for problem solving.	1. Learn and understand the fundamentals of flow chart and processing. 2. Acquire skills of use of variables, conditional jump, and loop processing in program code. 3. Acquire skills of I/O device control.
Introduction to Industrial Design	Based on design perspective and design thinking, students will learn about industrial design procedures and basic methods with small practice. This course provides an overview of industrial design. To understand industrial design critically, student should have the view point of design history, material culture and user centered design. Based on this criteria, introducing the structured method to	This course aims to give an overview of the history, function, and actual of industrial design, deepen understanding of its pluralistic functions and meanings.	1. Understand the necessity of man – machine system through modern design history and design survey. 2. Understanding the significance of design in society, we will be able to choose the way to evaluate design appropriately. 3. Understand the methods of industrial design and become able to use technical terms properly.

	analyze industrial design process.		
Introduction to Information and Communication Engineering	This course aims to understand the overview of advanced research topics about information and communications engineering. 6 of 12 faculty members give lectures biweekly about their research themes and topics in omnibus form. Not only faculty member's specialty but also the basic and wide knowledge about communications engineering can be acquired.	The students taking this course will be able to understand the overview of advanced research topics on information and communication engineering.	1. Acquire an overview of advanced research topics about information and communication engineering. 2. Understand the basic principles of information and communication technology. 3. Develop skills to understand the implications of information and communication technologies applied in the society
Mechanics of Materials Exercises	When mechanical engineers design various mechanical structures and investigate accident causes, they have to always use knowledge with regard to Mechanics of Materials. Hence it is very important to solve various practice exercises based on actual structures to learn Material Mechanics. In this course, students solve the various practical exercises with regard to Mechanics of Materials, which are prepared, everytime. Answers and ways to solve these problems are also explained.	The subject of the lecture is that students can solve any problems with regard to Mechanics of Materials. And the students can also model actual structures and machines to enable to solve by means of Mechanics of Materials theoretically.	1. To calculate displacements of truss structures which are receiving loads. 2. To calculate twisting angle of circular bar which is receiving loads. 3. To calculate deflection and deflection angle of beams which are receiving loads. 4. To calculate deformations and stresses of beams which are receiving combined stress. 5. To calculate deformations and stresses of complex structures which are receiving loads.
Mechatronics (Prerequisites: Basic electronics, Mechanism, Control system 1 Prepare your own laptop.	Mechatronics is a combination of mechanical and electronic engineering in Japanese and English. In this course, you will study sequence control using a programmable logic controller (PLC) as a mechatronics system and its	There are several ways to build a mechatronics system. As a basis of mechatronics, you will learn three parts: mechanical parts, electrical parts, and software parts. Then, build a PLC system that combines them. In addition, you will learn how to control the	1. Construction of sequence control system using electromagnetic relay. 2. PLC Programming with ladder language. 3. Programming for H8 microcomputer with C language.

Programming is done on your own laptop.)	related applications. Topics include ladder logic diagrams, input / output modules, power supplies, controller and instrument interfaces. In addition, using the H8 microcomputer system, you will practice C language programming running on the microcomputer.	system using C language using the H8 microcomputer system.	
Mechatronics (Prerequisites: N/A)	Mechatronics, when regarded from the standpoint of mechanical engineer, said to be a methodology of integrated mechanical design combined with control, which consists of mechanical plus electronic elements. Typically, adding the sensor and the microprocessor in the machine often realizes systems with high controllability and intelligent behavior has become easier than that comprise of pure mechanical elements + mechanism only. Thus, mechatronics is convenient and essential, rather than new, methodology of mechanical design. The course covers topics of mechatronic elements including microcontrollers and motors, and an introduction to software design particularly useful in the context of mechatronics. It deals with fundamentals in event-driven programming, electrical and electronic engineering, DC motors, mechanical and solid-state switching devices,	This course will put an emphasis on the acquisition of the knowledge and experience in software, electrical and electronic engineering, because students who major mechanical engineering and try mechatronic design should focus on master them. This course will NOT cover fundamental topics in machine elements and mechanisms.	1. Students should be familiar with the concepts of microcontrollers, event driven programming, and should be able to read and write state diagrams and C programs that configure and use microcontrollers. 2. Students should be familiar with the principles and functions, be able to select and use mechanical switches, relays, motors, diodes, transistors, FETs and op amps. 3. Students should be understood the working principles and operation of the DC motors, motor drivers, and basic feedback control.

	operational amplifier, power supply circuits, and microcontrollers, with examples.		
Numerical Thermo-Fluid Engineering	*	*	*
Opto-Electronics	The field of Optoelectronics, also referred to as photonics, has continued to evolve during several decades. Optoelectronics is an electronic technology concerning light waves emitted from laser diodes. Optoelectronics is widespread among a various kinds of fields, such as optical communication, optical information technology, optical measurement technology, and so on. In this course, concepts of optoelectronics are introduced and optical devices which support significant progress in optoelectronics are studied.	Concepts of optoelectronics are studied.	1. will comprehend basic theories of lightwaves and be able to derive wave equations from Maxwell's equations. 2. will comprehend refraction and reflection of lightwaves and be able to explain total reflection. 3. will comprehend light emitting diodes and laser diodes and be able to explain their structures and characteristics. 4. will comprehend polarization of lightwaves and be able to explain propagation of lightwaves. 5. will comprehend optical devices and be able to explain their structures and characteristics.
Organic Materials Chemistry (Japanese(English accepted))	In material engineering, knowledge of organic reaction is important in order to understand the polymerization reaction. it is also essential for understanding recent topics of advanced organic materials such as chemical modification to materials, supramolecular polymers, and bio-functional material. This course provides the opportunity to review fundamental concepts of organic reaction.	Review of Fundamental concepts of nomenclature, structure and reaction mechanism of organic compounds through the active learning method	1. Understanding and appreciation of both chemical structures and organic reaction mechanisms in terms of electronic theory 2. Checking basic knowledge which is essential to understanding organic chemistry, such as nomenclature of organic compounds and stereochemical projection 3. Describing chemical reaction using the terms such as transition state and reaction intermediates, and

			understanding chemical kinetics and equilibrium
Phase Transitions in Materials (Japanese)	The casting or crystal growth are important processings of the solidification from molten state, therefore, the understanding of molten state is important for the material processings. In this lecture, the thermodynamics and statistical physics of molten state is introduced.	The importance of thermodynamics of molten matters will be understood. Students of this lecture can calculate the structure and properties of molten state of matters in typical cases.	1. Review the properties of liquid metals, colloidal liquid, ionic liquid. 2. Overlook thermodynamics of condensed matters. 3. Get the topics of molten materials of the latest research
Planning for Community Resilience	A lot of communities and cities in Japan and across the globe are exposed to the risk of disasters. This lecture will deal with the basic concept, technical analysis and integration methods, and planning strategies in relation to planning for community resilience, mainly focusing on natural disasters. Each class will be conducted in English with a lecture, presentations and discussions by students. The number of students will be limited to around 40 at a maximum. If the enrollment entry exceeds 40, those who have a higher score of TOEIC or equivalent English proficiency test will be accepted. The students in the Global Program will be given priority enrollment.	This course deals with the basic concept, technical analysis and integration methods, and planning strategies in relation to planning for community resilience, focusing on natural disasters such as floods, earthquakes, tsunamis, and landslides.	1. Students will learn the basic concept of planning for community resilience. 2. Students will learn about the technical analysis and integration methods of planning for community resilience. 3. Students will learn about the strategies of planning for community resilience.
Practice on Design Project 3	In this practice, you will study the principle of machine tools, actually operate them, and acquire the operation skills. Machine tools used in this practice	We learn to develop the sense of manufacturing.	1. You can understand the principles of various machine tools and explain their characteristics. 2. You can safely operate various machine tools.

	are lathes, milling machines, wire-cut electric discharge machines etc. And we will use various measuring equipments (hardness, strength, roughness, CCD, SEM) etc. We will manufacture the target product (for example, gyroscope) by using these machine tools and measuring equipments. We discuss the merits and demerits of each product.		3. You can manufacture the parts by machine tools based on the drawings.
Principles of Communication Systems	The course introduces the various methods of communication which are analog modulation/demodulation method, coding method, and digital modulation/demodulation method.	The aim of this course is to help students acquire an understanding of the basic modulation/demodulation.	1. At the end of the course, participants are able to understand some analog modulation/demodulation methods. 2. At the end of the course, participants are able to understand some coding methods. 3. At the end of the course, participants are able to understand some digital modulation/demodulation methods. 4. At the end of the course, participants are able to understand the basic of digital transmission (bit rate and error rate).
Recent Trends on Electronic Systems	This class presents recent research topics in the field of information systems. The research field includes: software engineering, constraint programming, image processing, network engineering, and social networking. Seven (7) professors in	This class is an English course to study the recent topics in the field of information systems and network systems.	1. Understand recent research topics in the field of information systems. 2. Acquire fundamental knowledge to understand recent research topics in the field of information systems. 3. Write appropriate reports according to professors' instruction.

	Department of Electronic Information Systems will serve the classes about recent trends in their research fields. Classes of each professor basically consist of a lecture and an exercise (two weeks). Follow the professors' instruction about their assignments, reports, and discussion.		
Recent Trends on Information Systems	This class presents recent research topics in the field of electronic systems. The research field includes: compound semiconductor devices, signal processing, antenna technology, electric circuit, control theory, media processing and astrophysics. Seven (7) professors in Department of Electronic Information Systems will serve the classes about recent trends in their research fields. Classes of each professor basically consist of a lecture and an exercise (two weeks). Follow the professors' instruction about their assignments, reports, and discussions.	This class is an English course to study the recent topics in the field of electronic systems and related physics.	1. Understand recent research topics in the field of electronic systems. 2. Acquire fundamental knowledge to understand recent research topics in the field of electronic systems. 3. Write appropriate reports according to professors' instruction.
Robotics (Japanese(English accepted))	A robot is a system consisting of basic technologies such as mechanism, control, material, electrical and information. To apply the robot technology to the target work, it needs to design the system according to the objective. We will study how to systemize the	The student can learn the methodologoly of a robot according to the social needs. The students can understand the elemental technoloy consisting of a robot and get the ability of system integration to meet the purpose.	1. To understand the design of a robot. 2. To understand basic technologies for a robot. 3. To understand the robot system and applications.

	basic technologies and how to find a solution for the social problem. In the class, we will discuss the actual problems and their solutions in the practical use of a robot to acquire the ability of solving a problem.		
Semiconductor Materials	In this lecture, emphasis is put on understanding the physics of semiconductors in terms of the behavior of electrons.	*	1. To understand electronic structure of semiconductors. 2. To understand carrier generation mechanism. 3. To understand physics of carrier transport.
Seminar on Mechanical Engineering 2 (Japanese(English accepted))	In this course, students in small group will learn technical writing methods and oral presentation skills in the context of a real engineering problem under the supervisor. This course also enhances the development of essential skills for oral and written communications and teamwork.	To develop the ability of technical writing methods, oral presentation skills and teamwork.	1. Students will be able to consider research results on the theme and make a presentation about them theoretically. 2. Students will be able to investigate information about the theme actively and improve your own skills. 3. Students will be able to collect information and/or reference from various databases and use them effectively. 4. Students will be able to complete the project according to schedule. 5. Students will be able to select relevant methods to solve engineering problems and carry out them.
Seminar on Technology and Society 1	This seminar gives overviews of social aspect and/or human aspect of technologies. Students consider how technology relates to society through discussion. Students in this course will also develop skills in research work and they will conduct	Students understand how technology relates to society through discussion. Students in this course will develop basic abilities and skills in research work according to their specialties. Students also develop abilities to deliver their research achievements to	1. Developing skills in gathering and analyzing information for research works from a social scientific view point. 2. Developing the problem solving ability by selecting relevant method through discussion in this course.

	research on topics of their specialties.	the others by written and oral communication.	3. Developing the problem solving ability through report writing, presentation.
Soft Materials Engineering	This course is an introduction to Science and Engineering on Soft Materials. Topics include soft mechanics, physical chemistry of soft materials and soft robots.	Soft materials include liquid, polymer gel, rubber and bio-polymers. They are stretchable and flexible in character. Various kinds of gels have been developed and applied to soft sensors and actuators. Recently soft rotoics are rapidly growing, and becomes interdisciplinary area. Students will study soft machines and robots based on soft materials. The goal of this course is to let students understand the states-of-art soft machines and discuss together.	1. To investigate articles about soft robots from database and understand them. 2. To understand mechanics of soft materials. 3. To understand mechanical, physical and chemical properties of soft materials.
Software Design	Software engineering is the application of a systematic, disciplined, quantifiable approach to the development, operation and maintenance of software. This course covers the basics of the software engineering and introduces what is designing software actually. We focus on the purpose and various techniques of software modelling, which is highly important in software design.	The aim of this course is to help students acquire basic knowledge of software engineering, It also enhances the development of students' skill in software modeling, which is fundamental of software design.	1. To understand the basics of software design. 2. To be able to read correctly documents described in UML (unified modeling languages). 3. To understand methods of describing various aspects of software.
Soil Mechanics A	(Outline and purpose of class) Construction structures are constructed on or under the ground. There are also structures that are built with soil, such as embankments. "Soil mechanics" is a study of the ground in the construction	Learn the basics of soil mechanics.	1. Understand the physical quantity of the soil and perform basic calculations. 2. Understand how to classify soil, and perform classification and analysis using appropriate indices. 3. Understand the basic mechanical concepts of soil and calculate effective

	field. The main purpose of "Mechanics of soil" is to recognize the properties of the soil material that composes this ground and to understand the properties and behavior of the soil. In particular, the study focuses on understanding the nature of soil as a granular material, the concept of water permeability and effective stress in the ground. (Attainment target) As stated in the above objectives, the goal is to recognize the properties of soil as granular material and to fully understand the concept of soil permeability and effective stress.		stress. 4. Understand the permeability and influence factors, and calculate the osmotic pressure and amount.
Spatial Modeling and Analysis	This lecture will introduce the existing urban models for understanding the structure and dynamics of cities. It will further look at how to develop models to investigate different spatial or socio-economic phenomena in the built environment. Computer-based analysis techniques will also be used to find spatial patterns and relations across different elements.	This course aims to develop modeling skills essential for theoretical research in urban planning. It is aimed at students entering into research, and introduces the approach of solving real urban planning problems through the use of models and spatial analysis. Majority of the classes will include a lecture and group discussion based on weekly readings in English.	1. Students will learn established existing urban models. 2. Students will learn the application of modeling in urban planning. 3. Students will be able to utilize complex systems theory and simulation modeling as an approach to explain emergent spatial patterns.
Theory of Computation (Japanese)	This subject deals the computations as mathematical objects. At present we have powerful computers, but they are limited by finite memories and finite calculation times. From a	To understand the fundamental theories of computation.	1. To understand the concept of Turing machines and to be able to discuss the theories of computation by using them. 2. To understand the concept of computability (Turin decidability) and to be able

	practical point of view it is desirable to develop efficient algorithms, while from a theoretical point of view it is important to determine whether or not the objective problem can be solved by our computers (computability) at first. Next, it becomes a problem whether or not the problem can be solved in a realistic time (computational complexity). In this course, we will formulate computational models such as Turing machine or While programs and will discuss the computability theory and the computational complexity theory.		to show the decidability/undecidability of a given elemental problem. 3. To understand the classes of computational complexites.
Urban and Regional Studies	This course will provide the basic knowledge of urban and regional planning in Japan and some foreign countries. History and development process of Tokyo Metropolitan Region will also be taught and discussed. Students will work on research project of one region, of urban and regional planning and do resentations in the class.	The course is designed so that the students will acquire basic knowledge of urban and reginal planning used in the world, and understand the current problems and future tasks. Students will also learn the skill to conduct a research and presentation in the topic, using English.	1. Students understand and can explain the basic concept and methodologies of urban planning in Japan 2. Students understand and can explain the basic difference of planning concept by countries. 3. Students has acquired the basic skills to do a research and can do presentation in English.