

日本芝浦工业大学 Sandwich Program 招生简章 2022 年 4 月入学

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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

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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 : 2022 年 4 月中旬—2022 年 7 月下旬
- 一年课程 : 2022 年 4 月中旬—2023 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 2021 全年的选课课表附件:

1. Undergraduate Level

春季学期 <u>http://timetable.sic.shibaura-it.ac.jp/table/2021/Timetable8X0318Z1.html</u> 秋季学期 http://timetable.sic.shibaura-it.ac.jp/table/2021/Timetable8X0328Z1.html

2. Graduate Level

春季学期 http://timetable.sic.shibaura-it.ac.jp/table/2021/Timetable8X0318Z5.html

秋季学期 http://timetable.sic.shibaura-it.ac.jp/table/2021/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: 2021 年 10 月 15 日

- (三) 合格发表: 2021 年 12 月中旬
- (四) 项目费用
 - 1. 课程费用
 - 准入费/Admission Fee : JPY40,000
 - 注册费/Registration Fee : JPY30,000

• 学费/Tuition : JPY12,000 per credit

*以上费用参考 2021 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。 ※以上费用及学费面向合作校学生。

- 2. 项目参加费
 - 半年课程:275,000 日币
 - 一年课程: 330,000 日币
- 3. 项目参加费明细
 - 费用包含:课程申请指导费、签证指导费、医疗保险、日本现地服务费、宿舍安置费、国际 邮寄费、部分课外活动补助费用;
 - 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: shdq@xf-world.org

咨询电话: 18621119787

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。

附件: 可选课程介绍

| Course title | Course description | Purpose of class | Goals and objectives |
|------------------|--------------------------------|----------------------------------|-------------------------------|
| | **This course may be | Understanding why "information | 1. To understand disparities |
| | cancelled according to | accessibility" is becoming more | between "information haves" |
| | COVID-19 situation, as field | important in modern society | and "information have-nots" |
| | works, case studies, and | through discussion, field works, | 2. To understand concepts of |
| | simulated experiences will be | case studies, and simulated | universal design, |
| | undertaken in this course. | experience. | barrier-free, and |
| | | | accessibility in information |
| | Disparities in information | | 3.To understand |
| | access between persons who | | "accessibility" in terms of |
| | can access information easily | | not only technical model but |
| | and persons who can not causes | | social and human rights model |
| | not only whether you have it | | |
| | but also economical | | |
| | disadvantage and social | | |
| | limitation. | | |
| Accessibility of | All people have equal rights | | |
| Information and | 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, 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. | Be able to understand propagation sound and to calculate sound field. Be able to understand operation of electro-acoustic systems and to design the systems. Be able to understand sense of hearing, acoustic parameters and employed unit in acoustics. Be able to understand sense of hearing, acoustic parameters and employed unit in acoustics. Be able to understand sense of hearing, acoustic parameters and employed unit in acoustics. 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 | Define the concept of genes and their function in relation to genomics. Analyze the evolution processes at the molecular level. 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 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. |

| | students feel involved in. The course also introduces | | 2. Acquire an analytical method to estimate economic |
|------------------------|----------------------------------------------------------|----------------------------------|---------------------------------------------------------|
| | the macroeconometric model | | 3 Learn regression analysis |
| | analysis to estimate a | | 4. Be able to use an analytical |
| | positive economic effect | | method that one sets a |
| | stemming from economic | | hypothesis and then tests it |
| | policies such as fiscal | | quantitatively. |
| | policy. At the end of the | | |
| | course, students will hand in | | |
| | the final paper. | | |
| | In terms of technical | * | 1.Possible to conduct |
| | calculation such as | | calculation using a numerical |
| | electrical circuit analysis, | | calculation software. |
| Applied | it may be impossible to obtain | | 2. Possible to explain purpose |
| Mathematics | solution directly from | | and solving method of |
| (Japanese (Engli | algebraic or differential | | nonlinear equations. |
| sh accepted)) | equations. Therefore, we have | | 3. Possible to explain purpose |
| (Prerequisites: | to employ computer-based | | and solving method of |
| You are expected | numerical analysis. This | | differential equations. |
| to be capable of | subject offers how to use | | 4. Possible to apply these |
| programming | numerical calculation | | method to electrical |
| (coding) using | software, solving method of | | calculation to obtain |
| one of any | nonlinear equation, | | solutions. |
| software.) | numerical integration | | |
| | method, and these | | |
| | applications for electrical | | |
| | calculations. | | |
| | Discrete Fourier transform | By learning the least-square | 1.Understanding the |
| | (DFT) is used for processing | method, the orthogonal function | least-square method and being |
| | sounds and graphics in | expansion, and Fourier series | able to approximate given |
| Annitist | digital computers. This | expansion, we acquire the basics | sequences of data or |
| Applied Nothematics | lecture aims at being able to | Tor processing signals like | Tunctions by linear functions |
| Mathematics | ao rourier series expansion, | sounds and images. | or quadratic functions. |
| (rrerequisites: | which forms the basis for DFI. | | 2. Understanding orthogonal |
| Dasic Knowledge | As an introduction to Fourier | | the extension of functions and being able to do |
| ol linear | series expansion we | | expansion for given function |
| angoura anu | method and the orthogonal | | by some given set of |
| ana 1 y 5 1 5/ | function expansion Fourier | | orthogonal functions |
| | series expansion is an | | 3 Understanding Gram-Schmidt |
| | instance of the orthogonal | | orthogonalisation which is a |
| | | | |

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| | Understanding Fourier series expansion forms the basis for understanding Fourier transform and DFT, which are topics covered in lectures of signal processing. | | 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 |
|--------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Architectural Design Studio (Japanese(Engli sh 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. | expansion. 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 | <pre>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</pre> | 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 | To be able to make diagrams to show the relationship between architectural forms and spaces. To be able to develop the skill to read architectural documents and to explain the knowledge on how architecture |
| | types. - Analysis on Plan Composition and Circulation, | acquire the architectural language, which is useful for the practice of planning and design. | Is planned and designed.3. To be able to present the analysis of architecture from |

| | 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 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. | | various points of view and to exchange the ideas with other students in English. |
|---------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 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, | -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. | Understand the basics of automotive engineering. Acquire the ability to investigate the details of car. Acquire the ability to discuss the purchasing targets of production car. |

| | production technologies and | | |
|--------------|-------------------------------|-----------------------------------|---------------------------------|
| | future cars are described. | | |
| | Measurements of biological | Deepen their knowledge on | 1. Be able to explain the basic |
| | structures and functions are | biological characteristics and | concepts of biological |
| | necessary in order to | measurement principle in order to | phenomena and measurements. |
| | understand biological | utilize the biological | 2.Be able to explain the |
| | phenomena and life | measurement technologies. | working principles of sensors |
| | activities. Various sensors | | and measurement equipment. |
| | and equipment are used in the | | 3.Be able to analyze the |
| | biomedical measurements, and | | principles and applications |
| | understanding of their | | of a biomedical measurements |
| | principles and measuring | | on their initiative. |
| | objects is important if we | | |
| Dismodiant | want to utilize them. This | | |
| Biomedical | course deals with basic | | |
| measurements | 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. | | |
| | Biosensor is a highly | This course presents the | 1.Comprehension for |
| | sensitive and specific sensor | molecular mechanisms of senses | fundamental of biomaterials |
| | created by mimicking the | and also describes the principle | and biosystems |
| | mechanism of living organisms | of biosensor to detect and | 2.Comprehension for concept |
| | to receive and recognize | quantify a certain molecule. | of biosensors |
| | external physical and | Biosensor recognizes the | 3.Comprehension for |
| | chemical signals (sense). | molecule by the detector element | application of biosensors |
| Biosensors | | 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. | |
|---------------|--------------------------------|------------------------------------|--------------------------------|
| | You will learn what a | The purpose of this class is to | 1.You can describe how to |
| | differential equation is and | learn how to recognize some of the | recognize some of the basic |
| | how to recognize some of the | basic different types of | different types of |
| | basic different types. You | differential equations, to learn | differential equations. |
| | will learn how to apply some | how to apply some common | 2.You can describe how to |
| | common techniques used to | techniques used to obtain | apply some common techniques |
| | obtain general solutions of | solutions of differential | used to obtain solutions of |
| Oslaulus with | differential equations and | equations and to appreciate how | differential equations. |
| | how to fit initial or boundary | differential equations arise in | 3.You can describe how |
| Equations | conditions to obtain a unique | applications. This class also | differential equations arise |
| Equations | solution. You will appreciate | includes a review on the content | in applications. |
| | how differential equations | learned in the class of | |
| | arise in applications and you | differential equations at the | |
| | will gain some experience in | time of first grade. | |
| | applying your knowledge to | | |
| | model a number of engineering | | |
| | problems using differential | | |
| | equations. | | |
| | Chemical spectroscopy | Understanding for the principle | 1. Understand the principle of |
| | provides you solid knowledge | and usage of spectroscopy in | absorption spectroscopy. |
| | and exercises about | quantitative and structural | 2. Understand the principle of |
| | spectroscopy. Spectroscopy | analysis of chemicals. | quantitative analysis of the |
| | is a practical and | | chemical by spectroscopy. |
| | contemporary way of | | 3.Understand the way to |
| | analytical chemistry. The | | analyze the structure of the |
| Chemical | applications of spectroscopy | | chemical by spectroscopy. |
| 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. | | |
| | Color is an essential aspect | In this course, we aim to learn | 1.Being able to observe color |
| | Tor practical design. This | pasic principle of color theory. | as a design aspect. |
| | course teaches color theory | in addition, we also aim to attain | 2. Being able to understand |
| Color Theory | for designing. The goal of the | the ability to apply color in | psychological |
| | to bondle sub- | prospective practical designing | 2 Deiner ebbe to of color. |
| | and computer colore by | based on theoretical knowledge. | functions of color |
| | understanding solar these | | communication |
| | understanding color theory | | communication. |

| | 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 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. | To deepen the knowledge of fuels. To understand the fundamentals of the combustion phenomenon. 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 | Students get familiar with MATLAB tool and obtain the ability to simulate and analyze the simulation result by using typical simulation technique. | Understanding the fundamental concepts of computer simulation. Understanding how to conduct a practical simulation to solve an engineering problem using MATLAB. Understanding how to handle and analyze the data. |

| | programming. | | |
|------------------|-------------------------------|-----------------------------------|---------------------------------|
| | This course provides a basic | Learning the overall knowledge to | 1. The students will be able to |
| | study on fundamentals on | have the child who asks the | understand the |
| | analysis of electric circuit. | voltage and an electric current | characteristics of resonant |
| | The course will be given in | using loop circuit equation, | circuit. |
| | the form of lectures and | nodal equation of equilibrium and | 2. The students will be able to |
| | exercises to help the | a law to various electric | proficiently use loop |
| Electric | students have a better | circuits. | equation and node equation in |
| Circuits 2 | understanding and | | various electric circuits |
| | proficiency in analyzing | | analysis. |
| | electric circuit. | | 3. The students will be able to |
| | | | understand general circuit |
| | | | theorem. |
| | | | 4. The students will be able to |
| | | | analyze 2-port circuits. |
| | Railway in Japan is | The purpose of this study is to | 1. Possible to explain |
| | well-developed. This class | understand electrical | development history of |
| | focuses on mainly | engineering technologies. | electric railway. |
| | electricrailway techlogy. | | 2. Possible to explain power |
| | | | supply system of electric |
| | | | railway. |
| | | | 3. Possible to explain |
| Electric Railway | | | 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. |
| | At this lecture, a technical | The purpose of this lecture is to | 1.Understanding of Surface |
| | or scientific matter required | study dry process and wet process | Treatments |
| | for a surface treatment is | in a systematic way. | 2.Understanding of Surface |
| Electrochemistr | explained, and a lecture is | | Treatment Methods and its |
| y of Metals | given about the foundation | | Applications |
| (Japanese (Engli | and technological | | 3.Understanding of the |
| sh accepted)) | application of a surface | | Importance and the Necessity |
| | treatment method. | | for Surface Treatment |
| | | | Technology in Material |
| | | | Engineering |
| Engineering | This course will cover how | 1. Engineering mathematics for | 1.Understand that |
| Mathematics | calculus, Fourier analysis, | radio engineering. | electromagnetic phenomenon, |
| | and other formulas are | Understand how calculus is | which can be expressed by |

| | applied in the field of | applied in radio engineering. | calculus, can be transformed |
|------------------|--------------------------------|-----------------------------------|--------------------------------|
| | information and | That includes reviewing the | into a functional equation. |
| | communications engineering. | electromagnetic phenomenon that | 2.Gain general engineering |
| | Engineering mathematics is | can be expressed by calculus and | techniques that can solve the |
| | crucial to understand the | gaining its functional equation. | functional equations. |
| | transmission of information | Then this will be followed by | 3.Understand and explain |
| | in the field of radio and | learning the general engineering | terms used in spectral |
| | acoustic wave engineering. | techniques that are needed to | analysis. |
| | Therefore, engineering | solve the functional equation. | 4.Solve basic spectral |
| | mathematics will be focused | | analysis practice questions. |
| | more in class. We will provide | 2. Engineering mathematics for | |
| | the students with as many | acoustic wave engineering. | |
| | tasks as possible throughout | Understand how Fourier analysis | |
| | the course. in order to have | is applied in this field. | |
| | a better understanding of | Students will be able to | |
| | this topic. | understand and explain the terms | |
| | | used in spectral analysis. | |
| | | followed by solving some basic | |
| | | spectral analysis practice | |
| | | questions. | |
| | Students will conduct | Through an appropriate research | 1. Students will set a precise |
| | environmental research in | procedure. students will write a | research subject. |
| | English under the supervision | research report and make a | 2. Students will conduct |
| Environmental | of one of a faculty member of | presentation in English about the | research through an |
| Research Seminar | the Department of | subject selected from the field | appropriate procedure for the |
| 1 | Architecture and Environment | of environmental studies | subject. |
| | Systems. | including architectural studies, | 3.Students will write a |
| | - | urban studies, and social | research report and make a |
| | | studies. | presentation in English. |
| | "Sustainable Development | In this lecture, we aim to learn | 1. Students can learn basic |
| | Target (SDGs)" was adopted at | how companies are taking SDGs, | knowledge on international |
| | the international summit of | what kind of actions and | framework and efforts on |
| | September 2015. | technologies are required for | sustainability. |
| | Toward a sustainable society, | achieving the goals based on an | 2. Students can learn business |
| | companies as well as the state | engineering viewpoint. | activities based on |
| Environmentally | are required to initiate | | engineering grounds. |
| Sustainable | aggressive behavior with | | 3.Students can think and |
| Engineering | corporate social | | propose what companies should |
| | responsibility. | | do toward a sustainable |
| | In this lecture, we aim to | | society. |
| | learn how companies are | | |
| | taking SDGs, what kind of | | |
| | actions and technologies are | | |

| | required for achieving the | | |
|--------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| | goals based on an engineering | | |
| | viewpoint. | | |
| Exercise in Architectural Studio 4 (Japanese) | <pre>goals based on an engineering viewpoint. "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 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,</pre> | 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. " | Can design medium- to large-scale facilities (non-residential and non-wooden). Demonstrates modeling, design, and conceptual capabilities from structural planning to equipment planning. Continue to improve the skills of drawing ability, modeling ability, spatial grasping ability, and diagramting ability. Be able to explain the space you are envisioning in a language, diagram, etc. Investigates and discusses prior cases and references. |
| | diagramting ability) in the | | |
| | department of architecture " | | |
| | *The schedule and the dotail | Understand the social problems in | 1 Understand the nurness and |
| Exercise in | of the program in 2020 connet | our society and propose the | function of public facility |
| Space and | be fixed because of the | solutions for it by the | runderon of public facility. |
| Architecture | opropovirus outbrook in the | architectural design Vou are | 2 Understand the |
| Design 4 | world All students who wish | anonicectural design. Tou are | z. Understand the |
| | world. All students who wish | encouraging to design the urban | relationship of public |

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 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

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. 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.

| | design a museum in Ueno Park. | | |
|-----------------|--------------------------------|----------------------------------|--------------------------------|
| | This course requires students | -To discover issues about local | 1. To have better observation |
| | to understand changing | community. | skills to understand |
| | contemporary urban society | -To obtain skills to envision a | contemporary social issues. |
| | through the fieldwork and | desirable future community and | 2. To collect appropriate data |
| | propose the desirable | propose district plan and | and to grasp current |
| | district plan and | architecture. | situation through the data |
| Eveneice in | architecture to sustain local | | analysis. |
| Exercise in | community. Students will | | 3. To obtain visions to create |
| Pogional Dasign | obtain skills to envision a | | better future community. |
| (lenenece) | desirable future community | | 4. To present the concrete |
| (Japanese) | and propose district plan and | | proposal of plan and |
| | architecture. | | architecture for local |
| | | | community and process to |
| | | | realize them. |
| | | | 5.To have better skills of |
| | | | presentation to communicate |
| | | | with local citizen. |
| | Exercises on design issues. | (The first quarter) Students | 1.Learn the design skills of |
| | In order to apply the skills | learn from design of dwelling | public and medium-sized |
| | learned in "Urban | unit, way of gathering, | facilities. |
| | architectural design | relationship with urban area and | 2. Understand management |
| | exercise 3" in the latter part | design the dwellings which are | concepts specialized in |
| | of the second year to more | important elements of urban | architecture such as VE and |
| | sophisticated urban | landscape. | FM. |
| | architecture, design a number | (The 2nd quarter) Students | 3.To improve drawing |
| | of design issues. The first | understand diverse programs on | capacity, modeling ability, |
| | quarter is dwellings with RC | urban and architecture, master | space grasping ability, |
| Exercise in | construction and total | the architectural design while | diagrammatizing ability, and |
| Urban | surface of 3000 to 5000 m 2, | reading the context of the | logic. |
| Architecture | and it keeps continuity from | surrounding environment. | 4. Acquire the ability to |
| Design 4 | the design object of the | | explain a project with |
| (Japanese) | second year (public, RC | | languages, diagrams, etc. |
| | construction, asurface of | | 5. Acquire survey ability and |
| | 1000 ~ 1600 m 2). In the 2nd | | critique eyes of precedent |
| | quarter, it corresponds with | | cases and reference cases. |
| | 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. | | |
|-----------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 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 of fluids, static and dynamical aspects of fluids. In addition, dimensional analysis will be taught with examples. | To learn the basic knowledge on fluid properties (continuity, density, viscosity, and surface tension). To learn the fundamentals of fluid statics (absolute/gauge pressure, manometers, Pascal's law, pressure distribution, forces acting on a solid surface immersed in liquid, buoyancy, Archimedes' principle). 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). To learn the dimensional analysis (basic/derived quantities, Buckingham's pi-theorem, similarity parameters). To learn the applications of the above concepts to fluid flow problems. | To understand the concept of fluid and to be able to explain the properties of fluid. To understand the hydrostatic forces acting on a solid surface immersed in liquid and to be able to calculate them in a specific situation. 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. 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 | The goals of this course are to - Be able to understand basic knowledge of each component in | At the end of the course, participants are expected to obtain basic knowledge of |

| Information | <pre>water resources). *</pre> | <pre>water cycle - Be able to understand and explain how to monitor and model water cycle *</pre> | <pre>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 *</pre> |
|---------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Communication Technology | | | |
| Interaction Design | Interaction design is incorporated into a product' s overall design from the very beginning to optimize the 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. | To offer a cross-disciplinary, practical, and process-oriented introduction to the field. The target students need no preliminary background and can be from the various field. | The students can understand the basic idea of user interface, user experience, and HCI. The students can explain the principles of Interaction design 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 | 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). | 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 Students can understand |

| | of technologies and systems, | | some basic aspects of |
|-----------------|-------------------------------|------------------------------------|------------------------------------|
| | and international framework. | | environmental science and |
| | A recognition of the complex | | environmental policy as |
| | of environmental problems | | presented in class |
| | needed to address current | | 3.Students can use |
| | international development is | | fundamental skills of project |
| | the primary focus of this | | management |
| | 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 | | |
| | development, and skills of | | |
| | the project management, | | |
| | examining best mix of | | |
| | policies and technologies in | | |
| | line with the concept of | | |
| | sustainable development. | | |
| | This course aims to provide | The objective of this course is to | -understand and explain the |
| | students with an | - understand and explain the | basic contents of each field |
| | understanding of the role of | basic contents of each field | |
| | electrical engineering in | - understand and explain the | -understand and explain the |
| | real life and the future. | social background and technical | social background and |
| Introduction of | This course consists of 4 | background of each field. | technical background of each |
| Electrical | fields, power and energy | - understand and explain the | field. |
| Engineering | system, electrical materials | issues and future trends in each | and a straight and some later that |
| Research | and devices, information/loT | field. | -understand and explain the |
| | system, and robotics. | | assues and future trends in |
| | This course is provided by 6 | | |
| | taculties from all faculty of | | |
| | the department of electrical | | |
| | engineering. | | |
| Introduction to | This course provides | Topics covers linear system | 1. student can solve simple |
| Control | fundamentals of the control | theory; mainly responses of | differential equations |
| Engineering | engineering. which is applied | 1st/2nd order system. stability | applying of the Laplace |
| | | | -FF. Jung of the Edhidoo |

| | to various automation devices. The main topics of the class are Laplace transforms, transfer functions, transient characteristics, block diagrams and frequency characteristics. | and frequency analyses. | <pre>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</pre> |
|---------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Introduction to Electromagnetis m | 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 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. | The purpose of this lecture is to understand physical phenomena of electricity, magnetism, and light in a unified theory of Maxwell. | <pre>diagram of given system 1. Understand the notion of electromagnetic field both from qualitative and quantitative points of view. 2. Understand Maxwell equations and master how to use them. 3. Understand the force acting on a charged particle in electromagnetic field.</pre> |
| 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 1/0 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 | 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. | Learn and understand the fundamentals of flow chart and processing. Acquire skills of use of variables, conditional jump, and loop processing in program code. Acquire skills of 1/0 device control. |

| 1 | | knowledge about communications engineering | | applied in the society |
|----------------------------------|----------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Intro Infoi Commu Engir | oduction to rmation and unication neering | 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 | The students taking this course will be able to understand the overview of advanced research topics on information and communication engineering. | Acquire an overview of advanced research topics about information and communication engineering. Understand the basic principles of information and communication technology. Develop skills to understand the implications of information and |
| Intro Indus Desig | oduction to strial gn | micro-controller and 1/0 devices should be developed. And presentation should be processed by the members of the groups. 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 analyze industrial design process. | This course aims to give an overview of the history, function, and actual of industrial design, deepen understanding of its pluralistic functions and meanings. | Understand the necessity of man - machine system through modern design history and design survey. Understanding the significance of design in society, we will be able to choose the way to evaluate design appropriately. Understand the methods of industrial design and become able to use technical terms properly. |

| | 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. | means of Mechanics of Materials theoretically. | 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. Programming is done on 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 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. | 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 system using C language using the H8 microcomputer system. | Construction of sequence control system using electromagnetic relay. PLC Programming with ladder language. Programming for H8 microcomputer with C language. |
| 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 | 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. | 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. Students should be familiar with the principles and functions, be able to select |

| | avatama with high | | and was mashenical switches |
|-----------------|-------------------------------|---------------------------------|-------------------------------|
| | systems with high | | and use mechanical switches, |
| | controllability and | | relays, motors, diodes, |
| | intelligent behavior has | | transistors, FEIs and op |
| | become easier than that | | amps. |
| | comprise of pure mechanical | | 3.Students should be |
| | elements + mechanism only. | | understood the working |
| | Thus, mechatronics is | | principles and operation of |
| | convenient and essential, | | the DC motors, motor drivers, |
| | rather than new, methodology | | and basic feedback control. |
| | 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 | | |
| | switching devices, | | |
| | operational ampriller, power | | |
| | supply circuits, and | | |
| | microcontrollers, with | | |
| | examples. | - | |
| Numerical | * | * | * |
| Thermo-Fluid | | | |
| Engineering | | | |
| | The field of Optoelectronics, | Concepts of optoelectronics are | 1.will comprehend basic |
| | also referred to as | studied. | theories of lightwaves and be |
| | photonics, has continued to | | able to derive wave equations |
| | evolve during several | | from Maxwell's equations. |
| | decades. Optoelectronics is | | 2.will comprehend refraction |
| Onto-Electronic | an electronic technology | | and reflection of lightwaves |
| | concerning light waves | | and be able to explain total |
| 5 | emitted from laser diodes. | | reflection. |
| | Optoelectronics is | | 3.will comprehend light |
| | widespread among a various | | emitting diodes and laser |
| | kinds of fields, such as | | diodes and be able to explain |
| | optical communication, | | their structures and |
| | optical information | | characteristics. |

| | 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. | | 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(Engli sh 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 | Understanding and appreciation of both chemical structures and organic reaction mechanisms in terms of electronic theory Checking basic knowledge which is essential to understanding organic chemistry, such as nomenclature of organic compounds and stereochemical projection 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. A lot of communities and | 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. | Review the properties of liquid metals, colloidal liquid, ionic liquid. Overlook thermodynamics of condensed matters. Get the topics of molten materials of the latest research Students will learn the |
| 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 | concept, technical analysis and integration methods, and planning strategies in relation to planning for community resilience, focusing on natural disasters such as floods, | basic concept of planning for community resilience. 2. Students will learn about the technical analysis and integration methods of planning for community |

| | planning strategies in | earthquakes, tsunamis, and | resilience. |
|------------------|--------------------------------|-----------------------------------|-------------------------------|
| | relation to planning for | landslides. | 3.Students will learn about |
| | community resilience, mainly | | the strategies of planning |
| | focusing on natural | | for community resilience. |
| | 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. | | |
| | In this practice, you will | We learn to develop the sense of | 1.You can understand the |
| | study the principle of | manufacturing. | principles of various machine |
| | machine tools, actually | | tools and explain their |
| | operate them, and acquire the | | characteristics. |
| | operation skills. Machine | | 2.You can safely operate |
| | tools used in this practice | | various machine tools. |
| | are lathes, milling machines, | | 3.You can manufacture the |
| | wire-cut electric discharge | | parts by machine tools based |
| | machines etc. | | on the drawings. |
| Practice on | And we will use various | | |
| Design Project 3 | 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. | | |
| Principles of | The course introduces the | The aim of this course is to help | 1.At the end of the course, |
| Communication | various methods of | students acquire an | participants are able to |
| Systems | communication which are | understanding of the basic | understand some analog |
| | analog | modulation/demodulation. | modulation/demodulation |

| | modulation/demodulation method, coding method, and digital modulation/demodulation method. | | 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 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. | This class is an English course to study the recent topics in the field of information systems and network systems. | Understand recent research topics in the field of information systems. Acquire fundamental knowledge to understand recent research topics in the field of information systems. Write appropriate reports according to professors' instruction. |
| 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, | This class is an English course to study the recent topics in the field of electronic systems and related physics. | Understand recent research topics in the field of electronic systems. Acquire fundamental knowledge to understand recent research topics in the |

| | 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. | | field of electronic systems. 3. Write appropriate reports according to professors' instruction. |
|----------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Robotics (Japanese(Engli sh 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 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. | 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. | To understand the design of a robot. To understand basic technologies for a robot. To understand the robot system and applications. |
| Semiconductor Materials | In this lecture, emphasis is put on understanding the physics of semiconductors in terms of the behavior of electrons. | * | To understand electronic structure of semiconductors. To understand carrier generation mechanism. To understand physics of carrier transport. |
| Seminar on Mechanical | In this course, students in small group will learn | To develop the ability of technical writing methods, oral | 1.Students will be able to consider research results on |

| Engineering 2 (Japanese(Engli sh accepted)) | 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. | presentation skills and teamwork. | <pre>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.</pre> |
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| 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 research on topics of their specialties. | 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 the others by written and oral communication. | Developing skills in gathering and analyzing information for research works from a social scientific view point. Developing the problem solving ability by selecting relevant method through discussion in this course. 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 | To investigate articles about soft robots from database and understand them. To understand mechanics of soft materials. To understand mechanical, physical and chemical properties of soft materials. |

| | | robots based on soft materials. The goal of this course is to let students understand the states-of-art soft machines and discuss together. | |
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| 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. | To understand the basics of software design. To be able to read correctly documents described in UML (unified modeling languages). 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 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 | Learn the basics of soil mechanics. | Understand the physical quantity of the soil and perform basic calculations. Understand how to classify soil, and perform classification and analysis using appropriate indices. Understand the basic mechanical concepts of soil and calculate effective stress. Understand the permeability and influence factors, and calculate the osmotic pressure and amount. |

| | 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. | | |
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| 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. | Students will learn established existing urban models. Students will learn the application of modeling in urban planning. 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 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). | To understand the fundamental theories of computation. | To understand the concept of Turing machines and to be able to discuss the theories of computation by using them. To understand the concept of computability (Turin decidability) and to be able to show the decidability/undecidability of a given elemental problem. To understand the classes of computational complexites. |

| | 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. | | |
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| | This course will provide the | The course is designed so that the | 1. Students understand and can |
| | basic knowledge of urban and | students will acquire basic | explain the basic concept and |
| | regional planning in Japan | knowledge of urban and reginal | methodologies of urban |
| | and some foreign countries. | planning used in the world, and | planning in Japan |
| | History and development | understand the current problems | 2. Students understand and can |
| Urban and | process of Tokyo Metropolitan | and future tasks. Students will | explain the basic difference |
| Regional Studies | Region will also be taught and | also learn the skill to conduct a | of planning concept by |
| | discussed. Students will work | research and presentation in the | countries. |
| | on research project of one | topic, using English. | 3.Students has acquired the |
| | region, of urban and regional | | basic skills to do a research |
| | planning and do resentations | | and can do presentation in |
| | in the class. | | English. |