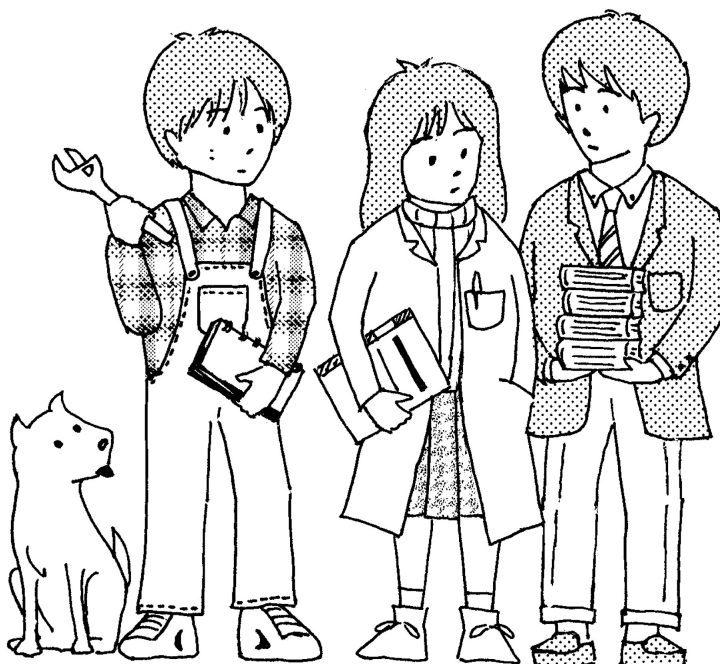


# *SYLLABUS*

2018

Common Subjects of Faculty of Engineering



Kyoto University, Faculty of Engineering

# Common Subjects of Faculty of Engineering

## Common Subjects of Faculty of Engineering

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**Introduction to Engineering**

工学序論

【Code】 21080 【Course Year】 1st year 【Term】 【Class day &amp; Period】 【Location】 【Credits】 1

【Restriction】 No Restriction 【Lecture Form(s)】 【Language】 【Instructor】 ,

【Course Description】

【Grading】

【Course Goals】

【Course Topics】

<b>Theme</b>	Class number of times	<b>Description</b>
	1~2	
	6	

【Textbook】

【Textbook(supplemental)】

【Prerequisite(s)】

【 】

【Web Sites】

【Additional Information】

# Engineering Ethics

## 工学倫理

【Code】21050 【Course Year】4th year 【Term】2018 first semester 【Class day & Period】Thu 3rd 【Location】Research Bldg. No.8, 3F, NS Hall 【Credits】2 【Restriction】No Restriction

【Lecture Form(s)】Lecture 【Language】Japanese

【Instructor】Dean of the Faculty of Engineering

Graduate School of Engineering, Professor, Makoto OHSAKI

Graduate School of Energy Science, Professor, Hirohiko TAKUDA

Graduate School of Engineering, Junior Associate Professor, Ryosuke MATSUMOTO

【Course Description】Modern ethics based on engineering aspect are becoming essential to present engineers and scientists. Instructors from various faculties give lectures about ethics in their research fields.

【Grading】Class participation and reports.

【Course Goals】The goal of this class is to understand engineering ethics, and to develop the ability to judge by yourself when you encounter ethical issues.

【Course Topics】

Theme	Class number of times	Description
Significance to learn engineering ethics(4/12)	1	This class gives students explanation about what engineering ethics is and the reason why it is necessary to learn it introducing some troubles in the field of transportation engineering and planning. (N. Uno: Global Engineering)
Ethics in information society on the view point of information technology(4/19)	1	Information devices such as PCs and smartphones and various web services such as SNS are very convenient, but there are also risks of being dangerous depending on usage. In this lecture, we describe the knowledge and the code of conduct to live safely in the information society. (A. Yamamoto: Informatics and Mathematical Science)
(4/26)	1	(M. Mizutani: Graduate School of Letters)
Ethical theories for engineering ethics (5/10)	1	This lecture will focus on basic ethical theories such as utilitarianism, deontology and virtue ethics which will be useful for thinking about particular ethical problems in engineering ethics. (S. Kodama: Graduate School of Letters)
Ethics in Architectural Engineering(5/17)	1	Discussions will be held to increase the ability as engineers to responsibly confront moral issues in the field of building engineering using actual technological activities as examples, such as putting water into fresh concrete, falsification of earthquake-resistance data, shoddy workmanship and architect qualification fraud. (M. Nishiyama: Architecture)
Engineering ethics in operation and maintenance of structures(5/24)	1	Although operation and maintenance of structures such as a plant and an aircraft require enormous labor and cost, unsuitable operation and maintenance may lead to serious accidents that cause unmeasurable damage. This class discusses engineering ethics that engineers are required under the situation. (T. Hayashi: Engineering Science)
Research and engineering ethics(5/31)	1	It is said that He that will do no ill, must do nothing that belongs thereto. The sense of ethics necessary to whom conducts research and engineering work in society is discussed in terms of the importance of equitability and fair evaluation to anyone involved in each area of research or engineering. (H. Mikada: Global Engineering)
Patents and Ethics (Part 1)(6/7)	1	This course will teach the students about 1) patent systems which protect inventions and research results and 2) ethical issues in patents. The first class, in preparation for the next subject of patent ethics, introduces Japan ' s patent system with comparisons to the patent systems in the world ' s major countries and international framework. (M. Nakagawa: Electrical and Electronics Engineering)
Patents and Ethics (Part 2) (6/14)	1	Students, equipped with the basic knowledge of patent systems by the previous lecture, will get familiar with actual case studies on ethical and legal issues in patents. (M. Nakagawa: Electrical and Electronics Engineering)
Ethics Required for Advanced Science(6/21)	1	Engineers and researchers are at the forefront of preventing harm caused by advanced chemistry. Think about social roles and ethics required by engineers and researchers through relationships between chemical substances and environmental problems, efforts to avoid hazards of nanomaterials. (K. Miura: Industrial Chemistry)
Ethics in nuclear engineering(6/28)	1	Nuclear technology can brew up an expansive and long-running catastrophe as well as it brings significant value of stable electricity in normal times. Some examples of ethics in nuclear engineering are introduced and important issues are talked. (I. Takagi: Engineering Science)
Ethics in biomedical engineering(7/5)	1	Recent dramatic progress in biology-related techniques, such as reproductive medicine, genome editing, and clone-animal techniques, is causing revolutions in the fields of medicines and food productions. Associated with it, problems of their safety and ethics are arising, which should be addressed by our societies. In this class, the recent progress in biology-related techniques, and problems we have and will have in near future are described. (M. Shirakawa: Industrial Chemistry)
Ethics of biotechnology and stem cell research(7/12)	1	With the rapid development of genome editing technology and stem cell engineering, editing of the human genome that goes beyond generations has become possible, at least technically. In this lecture, I will introduce these latest technologies and think about ethical problems accompanying technological development. (G. Eiraku: Industrial Chemistry)
Art-view Concept for Engineering(7/19)	1	Concept of "quality of life" is required for human related engineering. Some practical examples in medical-care and welfare fields will be introduced, and problem of the QOL-evaluation will be discussed from both function-optimizing view point and art view point. (N. Tomita: Engineering Science)
Ethics for Civil Engineers (7/26)	1	Civil Engineers play a key role on development of social infrastructures to protect people's lives from natural disasters and to support social and economic activities. This lecture introduces the engineering ethics on development of social infrastructures with specific examples. (T. Yagi: Global Engineering)

【Textbook】Lecture materials will be distributed.

【Textbook(supplemental)】

【Prerequisite(s)】

【】

【Web Sites】

【Additional Information】The class order is subject to change.

**Engineering and Economy(in English)**

工学と経済（英語）

【Code】22210 【Course Year】2nd year and above 【Term】2018 first semester 【Class day &amp; Period】Tuesdays 5th-6th

【Location】工学部総合校舎 1 1 1 講義室 【Credits】2 【Restriction】 【Lecture Form(s)】 【Language】English 【Instructor】Juha Lintuluoto

【Course Description】The purpose of this course is to teach economy from an engineer viewpoint. The course especially contains such economic topics which engineer can use to solve practical engineering economy problems. The course is consisted of lectures and additional exercises, of which the student should complete five (5) written short reports and five (5) 60 minutes laboratory session attendances. The laboratory sessions are held weekly after the lecture, and consist of interactive group work tasks. Laboratory sessions are held weekly from 18 to 19 o'clock.// The course is aimed for both Japanese and Foreign nationals.// The course starts on April 10th.

【Grading】Test, reports, laboratory performance.

【Course Goals】This course will provide tasks for engineering students to be able to understand relationships between engineering and engineering economy. Students will learn solving economic problems related to engineering project at various levels. The course also prepares the students to write engineering related economic topics in English as well as verbally express themselves of these subjects.

## 【Course Topics】

Theme	Class number of times	Description
Student orientation, Introduction to engineering economy	1	Course introduction; Principles of engineering economy
Cost concept	1	Cost terminology; Competition; Total revenue function; Breakeven point
Design economics	1	Cost-driven design; Making vs. purchasing; Trade-offs
Cost estimation techniques I	1	Integrated approach and WBS; Index, unit, and factor techniques
Cost estimation techniques II	1	Parametric estimating; Power-sizing technique; Learning curve; Cost estimation, bottom-up, top-down, target costing
The time value of money I	1	Simple interest; Compound interest; Equivalence concept; Cash-flow diagrams
The time value of money II	1	Present and future equivalent values of single cash flows
The time value of money III	1	Uniform series cash flows; Deferred annuities; Uniform gradient cash flows; Nominal and effective interest rates
Evaluation of a single project I	1	Determining minimum attractive rate of return (MARR); The present worth method; Bond value; Capitalized-worth method
Evaluation of a single project II	1	The future worth method; The annual worth method; The internal rate of return method; The external rate of return method
Comparison and selection among alternatives I	1	Basic concepts; The study (analysis) period; Useful lives are equal to the study period
Comparison and selection among alternatives II	1	Useful lives are unequal to the study period; Repeatability; Cotermination; The imputed market value technique
Income taxes and depreciation	1	Concepts and terminology; Depreciation; Straight-line method; Declining-balance method; Income taxes; Marginal tax; Gain or loss on the disposal of an asset; After-tax economic analysis
Final test	1	The test is based on the above topics

【Textbook】Sullivan, Wicks, Koelling; Engineering Economy, 15th Ed. 2012, Chapters 1-7.

【Textbook(supplemental)】

【Prerequisite(s)】Note:

- Interactive lessons (discussion), Small group working method
- This course is held in English.

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【Web Sites】None

【Additional Information】If you have any questions or need further information, feel free to contact at 090aglobal@mail2.adm.kyoto-u.ac.jp.

**Global Leadership Seminar I**

G L セミナー (企業調査研究)

【Code】24010 【Course Year】 【Term】 【Class day &amp; Period】 【Location】 【Credits】1 【Restriction】

【Lecture Form(s)】 【Language】Japanese 【Instructor】 ,

【Course Description】

【Grading】

【Course Goals】

【Course Topics】

Theme	Class number of times	Description
	1	
	2~3	
	2~3	
	12	
	3~4	
	1	
	1	

【Textbook】

【Textbook(supplemental)】

【Prerequisite(s)】

【 】

【Web Sites】

【Additional Information】

**Global Leadership Seminar II**

G L セミナー (課題解決演習)

**【Code】** 25010 **【Course Year】** 2nd year or higher **【Term】** FY2018, 2nd semester, intensive**【Class day & Period】** Intensive course **【Location】** Announced elsewhere **【Credits】** 1**【Restriction】** Restriction in number to around 20 selected students **【Lecture Form(s)】** Lecture and exercise**【Language】****【Instructor】** Faculty of Engineering, J. Assoc. Prof., Yoshinori Tanaka

Faculty of Engineering, J. Assoc. Prof., Ryuichi Ashida

Faculty of Engineering, J. Assoc. Prof., Aiko Takatori

Faculty of Engineering, J. Assoc. Prof., Tadao Mizuno

Faculty of Engineering, J. Assoc. Prof., Ryosuke Matsumoto

Related professors

**【Course Description】** This course is a small-group workshop program where students are supposed to extract or set up challenges by themselves aiming at creating new social values. In concrete, abilities of planning and problem-solving are trained through group works in residential training and skills of presentation and communication are enhanced through oral presentations regarding contents of the proposal at each step of the process from a preliminary draft to its completion.**【Grading】** It is required to join the residential training. A report meeting is held and comprehensive evaluation concerning abilities in group discussion to extract or set up challenges and to propose solutions for achieving a goal is made through presentation of the proposal as well as a submitted report.**【Course Goals】** Ability of planning, from extraction or setting up challenges to proposal of solutions aiming at creating new social values, is trained through group works.**【Course Topics】**

Theme	Class number of times	Description
Orientation	1	A brief overview and a schedule of the course are explained and working groups are organized.
Lectures	2	Lectures by experts are given.
Group works	3	Setting up challenges, extraction of problems, collecting information, and group works are done.
Residential training	7	Through intensive group works based on discussion, a proposal for solving problems is planned, a draft report is made, and a few presentations are made.
Preliminary review meeting	1	A preliminary review meeting is held and discussions are made.
Report meeting	1	Final presentations are made and reports are submitted.

**【Textbook】** Will be indicated as necessary.**【Textbook(supplemental)】** Will be indicated as necessary.**【Prerequisite(s)】****【】****【Web Sites】****【Additional Information】** Course open period: October to January

How to register the course will be instructed.

\*It depends on divisions which students belong to whether the earned credits are admitted as credits required for graduation. Please refer to the syllabus of your division.



**International Internship of Faculty of Engineering I**

工学部国際インターンシップ 1

**【Code】** 24020 **【Course Year】** Junior and Senior students **【Term】** Through the academic year**【Class day & Period】** Intensive course **【Location】** Defined in each internship program. **【Credits】** 1**【Restriction】** Defined in each internship program **【Lecture Form(s)】** Exercise **【Language】** English, et al.**【Instructor】** Chairperson of Foreign Students and International Academic Exchange Subcommittee, Faculty members in charge of educational affairs of the undergraduate school the registrant belongs to.**【Course Description】** Acquisition of international skills with the training of foreign language through the internship programs hosted by the University, the Faculty of Engineering, or the undergraduate school the applicant belongs to.**【Grading】** Merit rating is done based on the presentation or reports after each internship program. Each Department responsible to identify if the credit earned by this subject to be included as mandatory ones or not. If the credit is not included in the undergraduate school in which the participant belongs to, the credit is granted by the Global Leadership Education Center as a optional credit. The number of credits, either 1 or 2, will be determined depending on the contents and the duration of the program that the participant has participated in.**【Course Goals】** The acquisition of international skills with the training of foreign language through the to internship programs hosted by the University is the major expectation to the students.**【Course Topics】**

<b>Theme</b>	<small>Class number of times</small>	<b>Description</b>
Overseas Internship	1	The contents to be acquired should be described in the brochure of each internship program.
Final Presentation	1	A presentation by the student is required followed by discussion among participants.

**【Textbook】****【Textbook(supplemental)】****【Prerequisite(s)】** Described in the application booklet for each internship program. The registrant is requested to have enough language skills for the participation.**【】****【Web Sites】****【Additional Information】** It is required for students to check if the internship program to participate in could be evaluated as part of mandatory credits or not and could earn how many credits before the participation to the undergraduate school or educational program the student is enrolled. If the credit could not be treated as mandatory ones, get in touch with the Global Leadership Engineering Education Center.

## International Internship of Faculty of Engineering 2

工学部国際インターンシップ2

【Code】 25020 【Course Year】 Junior and Senior students 【Term】 Through the academic year

【Class day & Period】 Intensive Course 【Location】 Defined in each internship program. 【Credits】 2

【Restriction】 Defined in each internship program. 【Lecture Form(s)】 Exercise 【Language】 English, et al.

【Instructor】 Chair of Foreign Students and International Academic Exchange Subcommittee, Faculty members of the Undergraduate School the registrant belongs to.

【Course Description】 Acquisition of international skills with with the training of foreign language through the participation to the international internship programs held by the Faculty of Engineering or its subsidiary bodies.

【Grading】 Marit rating is done based on the presentation or reports after each internship program. Each Department responsible to identify if the credit earned by this subject to be included as mandatory ones or not. If the credit is not included in the undergraduate school in which the participant belongs to, the credit is granted by the Global Leadership Education Center as a optional credit. The number of credits, either 1 or 2, will be determined depending on the contents and the duration of the program that the participant has participated in.

【Course Goals】 The acquisition of international and foreign language skills through the participation to international programs is expected. Detailed objectives of the participation should be identified by each program.

【Course Topics】

Theme	Class number of times	Description
Overseas Internship	1	The contents to be acquired should be described in the brochure of each internship program.
Final Presentation	1	A presentation by the student is required followed by discussion among participants.

【Textbook】

【Textbook(supplemental)】

【Prerequisite(s)】 Described in the application booklet for each internship program. The registrant is requested to have enough language skills for the participation.

【 】

【Web Sites】

【Additional Information】 It is required for students to check if the internship program to participate in could be evaluated as part of mandatory credits or not and could earn how many credits before the participation to the undergraduate school or educational program the student is enrolled. If the credit could not be treated as mandatory ones, get in touch with the Global Leadership Engineering Education Center.

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( Common Subjects of Faculty of Engineering )  
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デザイン 工学研究科附属情報センター

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- ・ Common Subjects of Faculty of Engineering
- ・ [A] Global Engineering
- ・ [B] Architecture
- ・ [C] Engineering Science
- ・ [D] Electrical and Electronic Engineering
- ・ [E] Informatics and Mathematical Science
- ・ [F] Industrial Chemistry
- ・ オンライン版 <http://www.t.kyoto-u.ac.jp/syllabus-s/>

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