

Tsuyama College				Advanced Mechanical and Control System Engineering Course				Year		2021					
Department Goals															
Course Category		Course Title	Course Code	Credit Type	Credits	Class Hours per Week								Instructor	Division in Learning
						Adv. 1st Y				Adv. 2nd Y					
						1st		2nd		1st		2nd			
						1Q	2Q	3Q	4Q	1Q	2Q	3Q	4Q		
General	Elective	Biotechnology	0006	Academic Credit	2	<div>2</div>								SHIBATA Norito	Elective subjects
General	Elective	Practical English I	0007	Academic Credit	2	<div>2</div>								RAMBO Eric	Elective subjects
General	Elective	Theory of International Culture	0008	Academic Credit	2	<div>2</div>								SUGIYAMA Akira	Elective subjects
Specialized	Elective	Methods of Scientific Experiments	0001	Academic Credit	2	<div>2</div>								YAMAGUCHI Daizo, KAWAI Masahiro	Elective subjects
Specialized	Elective	Reading on Technical English	0002	Academic Credit	2	<div>2</div>								CHO Feifei	
Specialized	Elective	General Aspects of Engineering I	0003	Academic Credit	2	<div>2</div>								HIROKI Kazuaki, MORITOMO Hiroki	
Specialized	Elective	General Aspects of Engineering II	0004	Academic Credit	2	<div></div> <div></div> <div>2</div>								TAKAGI Kenji	Elective subjects
Specialized	Compulsory	Thesis Work I	0005	School Credit	8	<div>8</div> <div>8</div>								SHIBATA Norito, YAMAGUCHI Daizo, MAEZAWA Takanobu, KONISHI Daijiro, INOUE Hiroyuki, HOSHINO Kazunori, NISHIKAWA Kotaro	Required subjects
Specialized	Elective	Information Science	0009	Academic Credit	2	<div></div> <div></div> <div>2</div>								TERAMOTO Takayuki	

Specialized	Elective	Basic Practice in Information Processing I	0010	School Credit	1	2							TAKETANI Hisashi	Elective Subjects
Specialized	Elective	Practice in Information Processing I	0011	School Credit	1	2							TERAMOTO Takayuki	Elective Subjects
Specialized	Elective	Basic Practice in Information Processing II	0012	School Credit	1			2					TAKETANI Hisashi	
Specialized	Elective	Practice in Information Processing II	0013	School Credit	1			2					TERAMOTO Takayuki	Elective Subjects
Specialized	Elective	Linear Algebra	0014	Academic Credit	2	2							MATSUDA Osamu	Elective Subjects
Specialized	Elective	Energy System Engineering	0015	Academic Credit	2			2					HOSOTANI Kazunori,SAEKI Fumihiro	Elective Subjects
Specialized	Elective	Advanced Design Engineering	0016	Academic Credit	2			2					KONISHI Daijiro	Elective Subjects
Specialized	Elective	Applied Creative Engineering	0017	Academic Credit	2	2							KONISHI Daijiro	Elective Subjects
Specialized	Elective	Advanced Control Apparatus	0018	Academic Credit	2	2							INOUE Hiroyuki	Elective Subjects
Specialized	Elective	Environmental Science Theory	0019	Academic Credit	2			2					KOBAYASHI Toshiro	Elective Subjects
Specialized	Elective	Engineering Ethics	0020	Academic Credit	2	2							HOSOTANI Kazunori,MIYASHITA Takuya	Elective Subjects
Specialized	Compulsory	Experiments of Mechanical and Control Systems	0021	School Credit	4	4	4						NOMURA Kensaku,INOUE Hiroyuki	Required Subjects
General	Elective	Practical English II	0026	Academic Credit	2					2			RAMBO Eric	Elective Subjects
General	Elective	Social Sciences	0027	Academic Credit	2							2	KADOYA Hidenori	

General	Elective	Modern Philosophy	0028	Academic Credit	2	<table><tr><td></td><td></td><td></td><td></td><td></td><td></td><td>2</td></tr></table>							2	KAMIYA Ken	Elective subjects	
						2										
Specialized	Elective	Special Lecture on Advanced Engineering	0022	Academic Credit	1	<table><tr><td></td><td></td><td></td><td></td><td colspan="3">Intensive</td></tr></table>					Intensive			HOSHOTANI Kazunori,TERAMOTO Takayuki,KONISHI Daijiro	Elective Subjects	
				Intensive												
Specialized	Elective	Production Control Engineering	0023	Academic Credit	2	<table><tr><td></td><td></td><td></td><td></td><td colspan="2">2</td><td></td><td></td></tr></table>					2				KAWAI Masahiro	Elective subjects
				2												
Specialized	Elective	Practice on Regional Cooperation	0024	Academic Credit	1	<table><tr><td></td><td></td><td></td><td></td><td colspan="2">1</td><td></td><td></td></tr></table>					1				HOSHOTANI Kazunori,TERAMOTO Takayuki	Elective Subjects
				1												
Specialized	Compulsory	Thesis Work II	0025	School Credit	8	<table><tr><td></td><td></td><td></td><td></td><td colspan="2">8</td><td colspan="2">8</td></tr></table>					8		8		KONISHI Daijiro,INOUE Hiroyuki,HOSHOTANI Kazunori,CHOU Felfei,NONAKA Shogo,OKESHinichiro	
				8		8										
Specialized	Elective	Mathematical Engineering	0029	Academic Credit	2	<table><tr><td></td><td></td><td></td><td></td><td colspan="2">2</td><td></td><td></td></tr></table>					2				YOSHOTANI Masaki	Elective subjects
				2												
Specialized	Elective	Scientific Investigation	0030	Academic Credit	2	<table><tr><td></td><td></td><td></td><td></td><td></td><td></td><td colspan="2">2</td></tr></table>							2		YAMAGUCHI Daizo	Elective subjects
						2										
Specialized	Elective	System Control Engineering	0031	Academic Credit	2	<table><tr><td></td><td></td><td></td><td></td><td></td><td></td><td colspan="2">2</td></tr></table>							2		YAGI Hideyuki	
						2										
Specialized	Elective	Fluid Mechanics	0032	Academic Credit	2	<table><tr><td></td><td></td><td></td><td></td><td colspan="2">2</td><td></td><td></td></tr></table>					2				SAEKI Fumihiro	Elective subjects
				2												
Specialized	Elective	Applied Control Engineering	0033	Academic Credit	2	<table><tr><td></td><td></td><td></td><td></td><td></td><td></td><td colspan="2">2</td></tr></table>							2		TAKETANI Hisashi	
						2										
Specialized	Elective	Computational Mechanics	0034	Academic Credit	2	<table><tr><td></td><td></td><td></td><td></td><td colspan="2">2</td><td></td><td></td></tr></table>					2				KOBAYASHI Toshio	Elective subjects
				2												
Specialized	Elective	Strength and Fracture of Materials	0035	Academic Credit	2	<table><tr><td></td><td></td><td></td><td></td><td colspan="2">2</td><td></td><td></td></tr></table>					2				SHIOTA Hirohisa	Elective subjects
				2												

Specialized	Elective	Vibrational Engineering	0036	Academic Credit	2	<div> <div></div> <div></div> <div></div> <div></div> <div>2</div> <div></div> <div></div> </div>	YAMAMOTO Yoshinori	Elective subjects
Specialized	Elective	Electric Energy Engineering	0037	Academic Credit	2	<div> <div></div> <div></div> <div></div> <div></div> <div></div> <div></div> <div>2</div> </div>	OKE Shinichi	Elective subjects
Specialized	Elective	Functional Materials	0038	Academic Credit	2	<div> <div></div> <div></div> <div></div> <div></div> <div></div> <div></div> <div>2</div> </div>	YAMAGUCHI Daizo	Elective subjects
Specialized	Elective	Long Term Internship	0039	Academic Credit	2	<div> <div></div> <div></div> <div></div> <div></div> <div>Intensive</div> </div>	HOSOTANI Kazunori, TERAMOTO Takayuki, KONISHI Daijiro	Elective subjects
Specialized	Elective	Practice on International Communication	0040	Academic Credit	1	<div> <div></div> <div></div> <div></div> <div></div> <div>Intensive</div> </div>	KONISHI Daijiro, HOSOTANI Kazunori, TERAMOTO Takayuki	Elective subjects

Tsuyama College		Year	2021		Course Title	Biotechnology
Course Information						
Course Code	0006		Course Category	General / Elective		
Class Format	Lecture		Credits	Academic Credit: 2		
Department	Advanced Mechanical and Control System Engineering Course		Student Grade	Adv. 1st		
Term	First Semester		Classes per Week	2		
Textbook and/or Teaching Materials	Textbook: Do not specify, and distribute reference materials in a timely manner during class. Reference book: Kodansha "Biotechnology Text Series Genetic Engineering" Jikkyo Shuppan "Basic Series for Life Sciences Advanced Technology and Ethics"					
Instructor	SHIBATA Norito					
Course Objectives						
Learning purpose : Understand intelligent mechanics based on biological knowledge by learning the principles, techniques and applications of genetic engineering, tissue engineering and biomimetics. Also, understand bioengineering based on natural science through this lecture.						
Course Objectives : 1. Understand the principles and applications of genetic engineering technology. 2. Understand tissue engineering using ES cells and iPS cells. 3. Understand biomimetics using the characteristics of living organisms from a mechanical point of view.						
Rubric						
	Excellent	Good	Acceptable	Not acceptable		
Achievement 1	Understanding and explain genetic engineering technology using nucleic acids, and how it can be useful in daily life.	Explain genetic engineering technology using nucleic acids.	Understand genetic engineering technology using nucleic acids.	Not reached		
Achievement 2	Understand and explain application examples of tissue engineering using iPS cells and ES cells.	Explain application examples of tissue engineering using iPS cells and ES cells Wear.	Understand tissue engineering using iPS cells and ES cells.	Not reached		
Achievement 3	Understanding and explain application examples of biomimetics that take advantage of the characteristics of living organisms and their principles.	Explain the application example of biomimetics that makes the best use of the characteristics of living things.	Understand the principles of biomimetics that take advantage of the characteristics of living organisms.	Not reached		
Assigned Department Objectives						
Teaching Method						
Outline	General or Specialized : Specialized  Field of learning : Biotechnology/Biomimetics/Tissue engineering  Foundational academic disciplines : Biology/Biological Science  Relationship with Educational Objectives : This class is equivalent to "(1) Cultivate human creative talent, rich in practical abilities".  Relationship with JABEE programs : The main goals of learning / education in this class is "(A) ..., A-1.  Course outline : Bioengineering has expanded not only to the fields of life science such as biology, medicine and agriculture, but also to bioengineering based on mechanical engineering. The core technologies are genetic engineering, tissue engineering and biomimetics. In this lecture, we will systematically explain from the basic explanation of these to the applied technology.					
Style	Course method : I will explain the main points while explaining on the board etc. based on the handouts. Timely, report assignments will be given according to the content of the lesson, and review and self-study will be encouraged. This course is a second-half course.  Grade evaluation method : The score of the final exam (70%) is evaluated by adding the reports up to each regular exam (30%). No retest will be conducted.					

Notice	<p>Precautions on the enrollment : This is a class that requires study outside of class hours. A total of 45 hours of study is required per credit, including both class time and study outside class time. Follow the instructions of the instructor regarding study outside of class hours.</p> <p>Course advice : I will explain from the basics so that you can understand even if you do not have basic knowledge of biology, so if you are interested in it, please take it.</p> <p>Foundational subjects : Biology (1st year), Chemistry I (2nd year), Chemistry II (3rd year), Applied Biology (4th year)</p> <p>Related subjects : Applied Chemistry (4th year)</p> <p>Attendance advice : Strictly adhere to the deadline for report assignments. Treat as absent when half of the class time has passed. If you have any questions about the lecture or anything related to it, please actively ask questions and deepen your understanding.</p>
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### Characteristics of Class / Division in Learning

<input type="checkbox"/> Active Learning	<input type="checkbox"/> Aided by ICT	<input checked="" type="checkbox"/> Applicable to Remote Class	<input type="checkbox"/> Instructor Professionally Experienced
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### E l e c t i v e s u b j e c t s

#### Course Plan

			Theme	Goals
1st Semester	1st Quarter	1st	Guidance	Understand the benefits of applying organisms to technological development
		2nd	Genetic engineering I	Understand the mechanism of DNA amplification by the PCR method, and further understand the role of each part of the actual PCR machine.
		3rd	Genetic engineering II	Understand the method of measuring the amount of DNA by real-time PCR using the PCR method and the principle and mechanism of the sequencing device that determines the base sequence based on the PCR method.
		4th	Genetic engineering III	Understand principle and mechanism of DNA typing method using PCR method
		5th	Genetic engineering IV	Understand the principles of genetic recombination in animals and plants
		6th	Genetic engineering V	Understand the potential application of genetic recombination in animals and plants to industry from actual examples
		7th	Tissue engineering I	Understand ES cells and iPS cells, which are the basis of tissue engineering, and understand their production methods in terms of cell engineering.
		8th	Tissue engineering II	Understand the bioactive substances required for tissue engineering using iPS cells and ES cells
	2nd Quarter	9th	Tissue engineering III	Understanding the scaffolding materials used in tissue engineering from a materials engineering perspective
		10th	Tissue engineering IV	Considering the possibility of tissue engineering from the aspects of cell engineering and medical engineering based on actual examples of tissue regeneration using iPS cells and ES cells
		11th	Biomimetics I	Understand the overall picture of biomimetics that applies and utilizes the characteristics of living organisms
		12th	Biomimetics II	Mechanically understand the adhesive tape developed from the hands of cockleburrs and geckos
		13th	Biomimetics III	Optically and mechanically understand the optical fibers developed from the scales of Morpho butterflies and the swimsuit developed by imitating shark skin
		14th	Biomimetics IV	Understand the mechanical advantages of the Shinkansen, which uses the honeycomb structure found in honeycomb structures, cushions and walls, and the shape of the kingfisher's beak
		15th	(Late term exam)	
		16th	Return of the late term exam and explanation of the answer	

### Evaluation Method and Weight (%)

	Examination	Presentation	Mutual Evaluations between students	Behavior	Portfolio	Other	Total
Subtotal	70	0	0	0	0	30	100
Basic Proficiency	70	0	0	0	0	30	100
Specialized Proficiency	0	0	0	0	0	0	0

Cross Area Proficiency	0	0	0	0	0	0	0
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Tsuyama College		Year	2021		Course Title	Practical English I	
Course Information							
Course Code		0007		Course Category		General / Elective	
Class Format		Lecture		Credits		Academic Credit: 2	
Department		Advanced Mechanical and Control System Engineering Course		Student Grade		Adv. 1st	
Term		First Semester		Classes per Week		2	
Textbook and/or Teaching Materials		Successful Keys to the TOEIC, Goal 500 (Kiriara); Handouts, Dictionary					
Instructor		RAMBO Eric					
Course Objectives							
[Learning purpose] To improve overall English ability as measured by the TOEIC. To improve presentation and communication skills by presenting research results and interacting with the audience.							
[Course Objectives] 1. Develop the English communication skills, and acquire basic English proficiency to understand and convey basic information and ideas about familiar matters and one's specialty. 2. Be able to give presentations at a level that is acceptable at international conferences. 3. Be able to prepare a speech manuscript written in English that is grammatically correct and logical. 4. To raise the score of language tests such as TOEIC as a means of measuring your achievement. ◎ : After understanding the other person, such as a technician or the general public, you can convey your own opinions and thoughts in an easy-to-understand manner and devise an explanation method, and gain a sufficient understanding.							
Rubric							
		Ideal Level		Standard Level		Unacceptable Level	
Achievement 1		Has acquired English proficiency very well to understand and convey basic information and ideas about familiar matters and one's specialty.		Has acquired English proficiency reasonably well to understand and convey basic information and ideas about familiar matters and one's specialty.		Has not acquired English proficiency to understand and convey basic information and ideas about familiar matters and one's specialty.	
Achievement 2		Can make a smooth presentation at a high level that can be used at international conferences.		Can make a smooth presentation at an acceptable level that can be used at international conferences.		Cannot make a smooth presentation at an acceptable level that can be used at international conferences.	
Achievement 3		Can fully solve TOEIC 400-point level vocabulary, grammar, reading comprehension, and listening comprehension problems.		Can generally solve TOEIC 400-point level vocabulary, grammar, reading comprehension, and listening comprehension problems.		Cannot solve TOEIC 400-point level vocabulary, grammar, reading comprehension, and listening comprehension problems.	
Assigned Department Objectives							
Teaching Method							
Outline		General / Specialty: General Areas of study: Foreign languages Basic disciplines: English, English and American literature, linguistics, phonetics  Relationship with Advanced Course learning goals: This course aims to learn from the advanced course "(6) Through off-campus training, special lectures on advanced technology, and participation in academic societies, we will cooperate with the local community and understand the importance of seeing things from a global perspective. It is a subject equivalent to. Relationship with engineer education program: The main goals of learning and education in this subject are "(F) Development of communication ability and presentation ability, F-3: To be able to communicate in English, which is an essential foreign language for engineers. ".  Class outline: Students will be able to make presentations in English while learning expressions and techniques that are frequently used in presentations, and also prepare for the TOEIC test.					
Style		Class method: To be able to express what you want to say in English by using the expressions studied in the class. At the same time, we will use the TOEIC textbook to prepare for taking the TOEIC test. Grade evaluation method: 50% weekly exercises (Assignments, quizzes, PowerPoint presentations.), 50% the results of two regular exams.					
Notice		Precautions for taking this course: This course is a "course that requires study outside of class hours". A total of 45 hours of study is required per credit, including the class hours and study outside of class hours. For study outside of class hours, follow the instructions from the instructor. Course advice: Actively participate in classes and submit assignments within the deadline. Given the current situation in which TOEIC is widely accepted as a means of judging English proficiency, have a positive attitude towards taking the TOEIC test. Basic subjects: English IV (4th), Elective English I (4), English V (5), Elective English II (5) Related subjects: Technical English reading (Specialty 1) Attendance advice: Admission after the start of class is considered to be late, and one credit hour will be counted as absent for two late arrivals.					
Characteristics of Class / Division in Learning							
<input checked="" type="checkbox"/> Active Learning		<input type="checkbox"/> Aided by ICT		<input type="checkbox"/> Applicable to Remote Class		<input type="checkbox"/> Instructor Professionally Experienced	
Elective subjects							
Course Plan							
			Theme		Goals		
1st Semester	1st Quarter	1st	Course introduction, e-learning and TOEIC explanation. TOEIC Unit 1		Understand the goals and method of the course. Effective TOEIC practice.		



		2nd	Describing company profiles (products, sales, etc.) TOEIC Unit 1	Understand company profiles. Effective TOEIC practice.
		3rd	Quiz; Researching a company and products. TOEIC Unit 2	Understand how to research a company. Effective TOEIC practice.
		4th	Making visual aids for PPT-1 Understand the role of profit. TOEIC Unit 2	Can make good visual aids. Understand profit. Effective TOEIC practice.
		5th	PPT-1 corrections, practice. TOEIC Unit 3	Can deliver the presentation smoothly. Effective TOEIC practice.
		6th	Deliver PPT-1	Deliver the presentation smoothly, use visual aids effectively.
		7th	Summary and preparation for the midterm exam. TOEIC Unit 4	Know all the vocabulary and grammar from the TOEIC lessons; Explain PPT-1 in writing.
		8th	Midterm exam	
	2nd Quarter	9th	Check answers and correct mistakes from the Midterm exam. TOEIC Unit 4	Learn from mistakes on the Midterm exam. Effective TOEIC practice.
		10th	Select and research a new company. TOEIC Unit 5	Conduct effective research. Effective TOEIC practice.
		11th	Research the company's foreign operations, TOEIC Unit 6	"
		12th	PPT-2 corrections, practice. TOEIC Unit 7	Can deliver the presentation smoothly. Effective TOEIC practice.
		13th	Deliver PPT-2	Deliver the presentation smoothly, answer questions effectively.
		14th	Summary and prepare for the Final exam. TOEIC Unit 7	Know all the vocabulary and grammar from the TOEIC lessons; Explain PPT-2 in writing.
		15th	(Final exam)	
		16th	Check answers and correct mistakes from the Midterm exam. Summary of English learning strategies.	Learn from mistakes on the Midterm exam. Plan for future English learning.

#### Evaluation Method and Weight (%)

	Examination	Presentation	Mutual Evaluations between students	Behavior	Portfolio	Other	Total
Subtotal	50	30	0	0	0	20	100
Basic Proficiency	50	30	0	0	0	20	100
Specialized Proficiency	0	0	0	0	0	0	0
Cross Area Proficiency	0	0	0	0	0	0	0

Tsuyama College		Year	2021		Course Title	Theory of International Culture
Course Information						
Course Code	0008		Course Category	General / Elective		
Class Format	Lecture		Credits	Academic Credit: 2		
Department	Advanced Mechanical and Control System Engineering Course		Student Grade	Adv. 1st		
Term	First Semester		Classes per Week	2		
Textbook and/or Teaching Materials	Textbooks : "No Text.(Use Printed) Reference Book:"ChuugokugoGakusu and Ibunkarikai Handbook"(Alc)					
Instructor	SUGIYAMA Akira					
Course Objectives						
Learning purposes : I abandon cultural prejudice and will wear the ability that can contribute to interchange in the daytime that will develop more in future..						
Course Objectives : 1. I understand the side unlike Japan of the China society. ◎ 2. I understand existence of other culture and wear a viewpoint to permit it again. 3. I can explain a claim, a thought of the self logically.						
Rubric						
	Excellent		Good		Acceptable	Not acceptable
Achievement 1	I understand culture unlike oneself and I permit it and can have the cooperation with it, a commensal heart..		I understand culture unlike oneself and I permit it and can do it.		I understand culture unlike oneself and I permit it and can do it.	I understand culture unlike oneself and cannot permit it
Achievement 2	understand culture of neighboring country China, social circumstances and can think about the Japanese and Japanese thought, action that you should adopt.		Through a comparison with Japan, I can understand culture of neighboring country China, social circumstances.		Through a comparison with Japan, I can understand culture of neighboring country China, social circumstances.	I cannot understand culture of neighboring country China, social circumstances.
Achievement 3	I can describe a claim, a thought of the self with passion and persuasive power.		I can describe a claim, a thought of the self with passion.		I can describe a claim, a thought of the self with passion.	I cannot describe a claim, a thought of the self well.
Assigned Department Objectives						
Teaching Method						
Outline	General or Specialized : General Field of learning : Foreign culture Foundational academic disciplines : Chinese/Oriental History/Chinese Philosophy/Chinese Literature  Relationship with Educational Objectives : This class is equivalent to "(6) By attending off-campus training, special lectures on advanced technology, study groups, etc., and also by coordinating with the regional community, students come to understand the importance of a global perspective."  Relationship with JABEE programs : The main goal of learning / education in this class is "(B) B-2", also "B-1" is involved.  Course outline : The summary of the class: I comment on modern circumstances in China with traditional Chinese culture. I give the problem book appropriately.					
Style	Course method : The method of the class: I concentrate 15 weeks in first piriod. In one class, I lecture with one theme in conjunction with the Chinese culture. The examination enforces twice of examining it in the middle examination and term end. I am going to impose two reports.  Grade evaluation method : 70% of results of two times of examinations assume it 30% of specific gravity by two problem reports. I can wear a viewpoint the problem report understands Chinese and China society how long and to permit sense of values different from oneself how, and it is just in a point of reference.					

Notice	<p>Precautions on the enrollment : This is a class that requires study outside of class hours. A total of 45 hours of study is required per credit, including both class time and study outside class time. Follow the instructions of the instructor regarding study outside of class hours.</p> <p>Course advice : Paying attention to news about China and Taiwan as preparations learning to perform beforehand. In addition, you understand the point well, and attend it to receive the authorization of the bachelor as it is a necessary lecture..</p> <p>Foundational subjects : World History (1st year), Politics and Economy (2nd), a Theory of Cross-cultural Society I (4th) Related subjects : Practice on International Communication (Advanced 1st year), Social Sciences (Advanced 2nd)</p> <p>Attendance advice : It is important to pay interest to the news and news such as a newspaper or TV to be always related to China. If tardy time is over 20 minutes, I assume it lack section handling.</p>
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#### Characteristics of Class / Division in Learning

<input type="checkbox"/> Active Learning	<input type="checkbox"/> Aided by ICT	<input checked="" type="checkbox"/> Applicable to Remote Class	<input type="checkbox"/> Instructor Professionally Experienced
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#### E l e c t i v e s u b j e c t s

#### Course Plan

			Theme	Goals
1st Semester	1st Quarter	1st	Why do yo learn China?	I understand the need of the Pekingology.
		2nd	Geography and language, race	I understand Chinese geography and language, race.
		3rd	The postwar history and Cultural Revolution of China	I understand Chinese history of after the war and the actual situation of the Cultural Revolution.
		4th	The national consciousness and principle of whole families	I understand the Chinese national consciousness and whole families principles.
		5th	Sinocentrism, Confucianism and Doke	I understand Sinocentrism, Confucianism and Doke.
		6th	Ethical view that human nature is basically evil, the view of human nature as fundamentally good, historical perspective	I understand ethical view that human nature is basically evil and the view of human nature as fundamentally good and a Chinese historical perspective.
		7th	mid-term test	I confirm the understanding degree of conventional learning contents.
		8th	Return and commentary of the midterm examination	I supplement an insufficient part of the past learning understanding.
	2nd Quarter	9th	One-child policy and the issue of aging	I understand the one-child policy and issue of aging in China. I subscribe to references and make a problem report.
		10th	Social polarization	I understand the difference problem that the China society has.
		11th	Taiwan and Hong Kong	I understand history and situation of Hong Kong and Taiwan.
		12th	environmental destruction	I understand an environmental problem of China.
		13th	Counterfeit brand	I understand counterfeit brand in China, the issue of violation of trademark.
		14th	The present of the Chinese company Subscription of references, making of the problem report	I understand in particular the current situation of the Chinese national enterprise. I subscribe to references and make a problem report.
		15th	Term-end examination	I confirm the understanding degree of conventional learning contents.
		16th	Return and commentary of the term-end examination	I supplement an insufficient part of the past learning understanding.

#### Evaluation Method and Weight (%)

	Examination	Problem report	Assginment	Quiz	Total
Subtotal	70	30	0	0	100
Basic Proficiency	70	30	0	0	100
Specialized Proficiency	0	0	0	0	0
Cross Area Proficiency	0	0	0	0	0

Tsuyama College		Year	2021		Course Title	Methods of Scientific Experiments	
Course Information							
Course Code	0001		Course Category	Specialized / Elective			
Class Format	Lecture		Credits	Academic Credit: 2			
Department	Advanced Mechanical and Control System Engineering Course		Student Grade	Adv. 1st			
Term	First Semester		Classes per Week	2			
Textbook and/or Teaching Materials	Textbooks : Introduction to the Daguchi Method" by Kazuo Tatebayashi (JUSE)						
Instructor	YAMAGUCHI Daizo,KAWAI Masahiro						
Course Objectives							
Learning purposes : Students will learn about the Taguchi Method, a technique developed from the Design of Experiments, in order to be able to carry out appropriate and reliable experiments and develop techniques.							
Course Objectives : 1. Understand the role and concept of parameter design and be able to explain the procedure. 2. Understand the concept and explain the procedure of parameter design of dynamic characteristics. 3. To understand the parameter design in the technology development stage.							
Rubric							
	Excellent		Good		Acceptable		Not acceptable
Achievement 1	Understand the role and concept of parameter design and be able to explain the procedure.		Understand the role and concept of parameter design and its procedures.		Understand the role and concept of parameter design and its procedures from the material.		Not reached the left column.
Achievement 2	Understand the concept of parameter design of dynamic characteristics and be able to explain the procedure.		Understand the concept and procedure of parameter design of dynamic characteristics.		Understand the concept and procedure of parameter design of dynamic characteristics by looking at the material.		Not reached the left column.
Achievement 3	Understand the parameter design in the technology development phase.		Understand the design of parameters at the technology development stage by looking at the material.		Understand, with the advice of a supervisor, the design of parameters in the technological development phase, looking at the material.		Not reached the left column.
Assigned Department Objectives							
Teaching Method							
Outline	General or Specialized : Specialized Field of learning : Basic and Common Natural Sciences Foundational academic disciplines : Relationship with Educational Objectives : This class is equivalent to "(1) Cultivate human creative talent, rich in practical abilities". Relationship with JABEE programs : The main goals of learning / education in this class are "(A), A-1, also "A-2" and "A-3" is involved. Course outline : In the natural sciences, where demonstration and reproducibility are important, experimentation is one of the most important means of natural cognition. In this course, students will learn about the Taguchi Method, a technique that evolved from the Design of Experiments method, in order to be able to carry out appropriate and reliable experiments and to develop techniques.						
Style	Course method : Lectures will be based on the textbook. Exercises will be given on the computer as students progress to deepen their understanding. Grade evaluation method : (1) Distribution of marks: Examination (report method) 100%. (2) Evaluation criteria: Students will be evaluated on the basis of their basic content and understanding of the items listed in the achievement objectives and their basic application. 60 points or more is a passing score. (3) Re-examination: Students who score less than 60 points will be re-examined if the teacher deems it necessary.						

Notice	Precautions on the enrollment : In addition to the 15 credit hours per credit, students are required to study 30 credit hours. Students are expected to follow the instructions of their teachers regarding these studies.
	Course advice : Students are expected to take an active role in acquiring knowledge in a wide range of fields, including some that are not their own. It is essential that students prepare for the course by studying and reviewing, and that they maintain an interest in technological development and quality control.
	Foundational subjects : Experiments and graduation theses in the department (2nd-5th years).
	Related subjects : Special Study on Mechanical and Control Systems Engineering I, II (1st and 2nd year), Special Study on Electronic and Information Systems Engineering I, II (1st and 2nd), Special Experiment on Mechanical and Control Systems Engineering (1st), Special Experiment on Electronic and Information Systems Engineering (1st).
	Attendance advice : In the lectures, various examples of case studies will be given so that students can learn how to think about them. Late arrival after 15 minutes from the start of a credit hour will result in an absence from class.

### Characteristics of Class / Division in Learning

<input checked="" type="checkbox"/> Active Learning	<input checked="" type="checkbox"/> Aided by ICT	<input checked="" type="checkbox"/> Applicable to Remote Class	<input checked="" type="checkbox"/> Instructor Professionally Experienced
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### E l e c t i v e s u b j e c t s

### Course Plan

			Theme	Goals
1st Semester	1st Quarter	1st	Guidance, Chap1 system and stability (Study outside class time: Assignment (1) Chap1)	To be able to understand engineered systems.
		2nd	Chap2 Introduction to Parameter Design 1 (Study outside class time: Assignment (2) Chap2)	Be able to understand the role, concepts and procedures of parameter design.
		3rd	Chap2 Introduction to Parameter Design 2 (Study outside class time: Assignment (2) Chap2)	Be able to understand examples of desirable parameter design.
		4th	Chap3 Parameter design of dynamic characteristics 1 (Study outside class time: Assignment (3) Chap3)	Understand the concept and procedure of parameter design of dynamic characteristics.
		5th	Chap3 Design of kinetic parameters 2 (Study outside class time: Assignment (3) Chap3)	Be able to understand the types of dynamic characteristics and how to calculate the signal-to-noise ratio.
		6th	Chap 4: Parameter design in the technology development phase 1 (Study outside class time: Assignment (4) Chap 4)	Be able to understand the design of parameters by objective function and technical means.
		7th	Chap 4: Parameter design in the technology development phase 2 (Study outside class time: Assignment (4) Chap 4)	Be able to understand examples of parameter design with basic functions.
		8th	1st semester mid-term exam	
	2nd Quarter	9th	Chap5 Parameter design for nonlinear systems, Chap6 Parameter design when input/output cannot be measured (Study outside class time: Assignment (5 and 6) Chap5 and 6)	Be able to understand an example where the goal is to have a non-linear relationship between inputs and outputs. Understand the parameter design using the dynamic functional window method.
		10th	Chap7 Designing parameters when input and output cannot be measured (Study outside class time: Assignment (7) Chap7)	Be able to understand software debugging using orthogonal tables.
		11th	Chap8 Loss function and its use 1 (Study outside class time: Assignment (8) Chap8)	Be able to understand the tolerance design of systems using loss functions.
		12th	Chap8 Loss function and its use 2 (Study outside class time: Assignment (8) Chap8)	Be able to understand the loss functions of the desirability and desirability characteristics.
		13th	Chap9 MT System 1 (Study outside class time: Assignment (9) Chap9)	Be able to understand the concept and technical challenges of anomaly determination.
		14th	Chap9 MT System 2 (Study outside class time: Assignment (9) Chap9)	Be able to understand the use of Mahara's bis distance in MT systems.
		15th	Chap10 Taguchi Method and Development Process Reform (Study outside class time: Assignment (10) Chap10)	Explain the problems with current development methods and the status and results of organisational use of the Taguchi Method.
		16th	Summary	

### Evaluation Method and Weight (%)

	Examination (Report)	Presentation	Mutual Evaluations between students	Behavior	Portfolio	Other	Total
Subtotal	100	0	0	0	0	0	100
Basic Proficiency	50	0	0	0	0	0	50
Specialized Proficiency	50	0	0	0	0	0	50
Cross Area Proficiency	0	0	0	0	0	0	0

Tsuyama College		Year	2021		Course Title	Reading on Technical English
Course Information						
Course Code	0002		Course Category	Specialized / Elective		
Class Format	Lecture		Credits	Academic Credit: 2		
Department	Advanced Mechanical and Control System Engineering Course		Student Grade	Adv. 1st		
Term	First Semester		Classes per Week	2		
Textbook and/or Teaching Materials						
Instructor	CHO Feifei					
Course Objectives						
Learning purpose: To develop the ability to understand the contents of academic English papers and apply to the work in the future, and to summarize and communicate them in an easy-to-understand manner.						
Course Objectives:						
1. To be able to search for appropriate English papers and to understand their contents.						
2. To be able to prepare slides in English on the contents of academic English papers and to make introductory presentations in Japanese.						
3. To be able to understand questions in English and to respond to them in Japanese.						
Rubric						
	Excellent	Good	Acceptable	Not acceptable		
Achievement 1	To be able to search for appropriate English articles, to understand their contents, and to make plans to reflect them in own activities.	To be able to search for appropriate English articles, to understand their contents.	To be able to search for appropriate English articles.	Can not be able to search for appropriate English articles.		
Achievement 2	Be able to prepare slides in English and give an introductory presentation in English (or Japanese) on the contents of an article in English.	Be able to prepare slides in English and give an introductory presentation in Japanese on the contents of an article in English.	Be able to prepare slides in English.	Can not be able to prepare slides in English.		
Achievement 3	To be able to give a presentation about own research in English, and to be able to answer questions in English (or Japanese).	To be able to give a presentation about own research in English.	To be able to prepare slides about own research in English.	Can not be able to prepare slides about own research in English.		
Assigned Department Objectives						
Teaching Method						
Outline	General or Specialized : Specialized Field of learning : Common and basic natural sciences Foundational academic disciplines : Engineering / Mechanical Engineering Relationship with Educational Objectives : This class is equivalent to "(6) Through extracurricular activities and participation in advanced technology lectures and academic societies, the student has learned to work with local communities and as well has acquired a global perspective. Relationship with JABEE programs : The main goals of learning / education in this class are "(F) ..., F-2: ...", also "A-2" is involved. Course outline : In this course, students will read articles and introduce literature, focusing on academic English papers. This course is designed to develop reading comprehension skills while confirming specialized knowledge, and to develop presentation and communication skills through the introduction of literature that summarizes and presents the contents of English articles.					
Style	Course method : The class will start with a literacy course on English papers and presentations in English, followed by a presentation of an outline of an English paper selected by the students using PowerPoint, various media, and the board. In addition, students will be required to write a report (1) to (3) selected by the instructor. The class will be conducted with a lot of time allocated for discussions (including presentations) between the instructor and students. After 4 weeks: Students who are scheduled to present next week will publish their selected papers, and other students will prepare questions for the next week in English (submitted as reports). After 4 weeks: Students who are scheduled to present the next week will publish their selected papers.  Grade evaluation method : Presentations (20% of the presentation, 20% of the slides, and 20% of the discussion), 30% of the report, and 10% of the quiz (written test) will be evaluated comprehensively.					
Notice	Precautions on the enrollment : This is a class that requires study outside of class hours. A total of 45 hours of study is required per credit, including both class time and study outside class time. Follow the instructions of the instructor regarding study outside of class hours. Course advice : Preparatory study to be done in advance. Basic knowledge of the specialized field is a prerequisite. Foundational subjects : English, basic knowledge of mechanical engineering and electronic control engineering Related subjects : Practical English I (1st year), Practical English II (2nd) Attendance advice : English is essential for engineers. If you are late for class for more than 15 minutes, you will be considered absent.					
Characteristics of Class / Division in Learning						

<input checked="" type="checkbox"/> Active Learning	<input type="checkbox"/> Aided by ICT	<input checked="" type="checkbox"/> Applicable to Remote Class	<input type="checkbox"/> Instructor Professionally Experienced
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## Course Plan

			Theme	Goals
1st Semester	1st Quarter	1st	Guidance, Research activities (Learning outside class time: Assignment (1) Research misconduct ①)	
		2nd	Research activities and papers (Learning outside class time: Assignment (2) About the laboratory (2))	
		3rd	Literacy education on academic literature (Learning outside of class time: Assignment (3) Submission rules, Decision on outline presentation paper (3))	
		4th	Presentation skills in English (Study outside class hours: Assignment (4) About my research (English), Preparation of English questions (1))	
		5th	Presentation of an outline of an article in English (1) (Study outside of class time: Assignment (5) Preparation of questions in English (2))	
		6th	Presentation of an outline of an article in English (2) (Study outside of class time: Assignment (6) Preparation of questions in English (3))	
		7th	Presentation of an outline of an article in English (3) (Study outside of class time: Assignment (7) Preparation of questions in English (3))	
		8th	Presentation of an outline of an article in English (4) (Study outside of class time: Assignment (8) Preparation of questions in English (4))	
	2nd Quarter	9th	Presentation of an outline of an article in English (5) (Study outside of class time: Assignment (9) Preparation of questions in English (5))	
		10th	Presentation of an outline of an article in English (6) (Study outside of class time: Assignment (10) Preparation of questions in English (6))	
		11th	Presentation of an outline of an article in English (7) (Study outside of class time: Assignment (11) Preparation of questions in English (7))	
		12th	Presentation of an outline of an article in English (8) (Study outside of class time: Assignment (12) Preparation of questions in English (8))	
		13th	Presentation of an outline of an article in English (9) (Study outside of class time: Assignment (13) Preparation of questions in English (9))	
		14th	Regular Exams	
		15th	Return and commentary of exam answers	
		16th		

## Evaluation Method and Weight (%)

	Examination	Presentation	Mutual Evaluations between students	Behavior	Portfolio	Other	Total
Subtotal	20	20	20	0	30	10	100
Basic Proficiency	0	0	0	0	0	0	0
Specialized Proficiency	20	20	20	0	30	10	100
Cross Area Proficiency	0	0	0	0	0	0	0

Tsuyama College		Year	2021		Course Title	General Aspects of Engineering I	
Course Information							
Course Code	0003			Course Category	Specialized / Elective		
Class Format	Lecture			Credits	Academic Credit: 2		
Department	Advanced Mechanical and Control System Engineering Course			Student Grade	Adv. 1st		
Term	First Semester			Classes per Week	2		
Textbook and/or Teaching Materials	有機機能材料 第2版（荒木孝二，明石満，高原淳，工藤一秋，東京化学同人）						
Instructor	HIROKI Kazuaki,MORITOMO Hiroki						
Course Objectives							
Learning purposes : To understand that the properties and functionality of various materials are determined at the atomic and molecular levels and at the level of molecular assemblies. Students will also understand that it is possible to evaluate the properties and functions of materials in detail by making full use of analytical instruments. Through this lecture, we aim to acquire the skills to manage so-called "materials" including mechanical materials not only from a macroscopic perspective but also from a microscopic perspective.							
Course Objectives : 1. Students will be able to explain the functions and properties of materials from the microscopic viewpoint of atoms, molecules, and molecular assemblies. 2. Students will understand the operating principles and characteristics of a variety of analytical instruments.							
Rubric							
	Excellent		Good		Acceptable		Not acceptable
Achievement 1	Students will be able to explain in their own words the functions and properties of materials from the microscopic viewpoint of atoms, molecules, and molecular assemblies, giving specific examples.		Students will be able to explain in their own words the functions and properties of materials from the microscopic viewpoint of atoms, molecules, and molecular assemblies.		Students understand the functions and properties of materials from the microscopic perspective of atoms, molecules, and molecular assemblies.		Not attained to the left.
Achievement 2	Students will be able to understand the operating principles and characteristics of analytical instruments and explain them in their own words. To be able to analyze the actual data obtained by oneself.		Students will be able to understand the operating principles and characteristics of analytical instruments and explain them in their own words.		Students will understand the operating principles and characteristics of analytical instruments.		Not attained to the left.
Achievement 3							
Assigned Department Objectives							
Teaching Method							
Outline	General or Specialized : Specialized Field of learning : Common and basic natural sciences Foundational academic disciplines : Materials Engineering (Structural and Functional Materials) Relationship with Educational Objectives :This class is equivalent to the major's learning objectives (2) Relationship with JABEE programs :The main goals of learning / education in this class are "(A) A-1". Course outline :All materials can be regarded as a set of "atoms and molecules" from a microscopic viewpoint. In the first half of this lecture, we will look at various functional materials at the atomic and molecular level, and try to bridge the gap between microscopic properties (electronic states of molecules and atoms, bonding modes) and macroscopic properties (thermal, mechanical, etc.) of materials. In the latter half of the lecture, various instrumental analyses, which are methods to evaluate the properties of materials, will be outlined. Through this lecture, students will learn to look at materials as "substances" and develop skills to process and handle them appropriately.						
Style	Course method : Mainly lecture-based. Grade evaluation method : In principle, the evaluation will be based on the scores of mini-reports and presentations given in each class (50%) and the regular exam (50%). The evaluation method will be discussed with the students.						
Notice	This is a class that requires study outside of class hours. A total of 45 hours of study is required per credit, including both class time and study outside class time. Follow the instructions of the instructor regarding study outside of class hours. Course advice : Motivation to learn is important. A proactive attitude is necessary. Foundational subjects : Chemistry I (2 years), Materials Science (2 years), Chemistry II (3 years), Mechanics of Materials I and II (3 and 4 years), Applied Chemistry (4 years) Attendance advice :If you attend lectures with a passive attitude, you will never learn the contents. Be sure to read the designated sections of the textbook before the lecture. Be careful not to rely on easy memorization. In order to understand the essence of the discipline of chemistry, I would like you to always keep thinking logically while attending the lectures.						
Characteristics of Class / Division in Learning							



<input type="checkbox"/> Active Learning	<input checked="" type="checkbox"/> Aided by ICT	<input checked="" type="checkbox"/> Applicable to Remote Class	<input checked="" type="checkbox"/> Instructor Professionally Experienced
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## Course Plan

			Theme	Goals
1st Semester	1st Quarter	1st	Guidance for the first half	
		2nd	Fundamentals of Functional Mechanical Materials	Students will confirm their knowledge of materials science and chemistry required for this course and prepare for future lectures.
		3rd	Optoelectronic materials	Students will understand the properties of optical materials such as optical lenses and optical fibers.
		4th	Electrical and Electronic Functional Materials	Students will understand the various properties of dielectric and conductive materials.
		5th	Mechanics and strength functional materials①	Students will understand the mechanical properties of polymer materials and the general theory of viscoelasticity.
		6th	Mechanics and strength functional materials②	Students will understand the properties and structures of various high strength and high elasticity polymers.
		7th	Summary of the first half	To check the degree of retention of knowledge through reading of papers.
		8th	Guidance for the second half	
	2nd Quarter	9th	Preface to Machine Analysis	Students will understand the advantages, features, and cautions of instrumental analysis.
		10th	Thermal Analysis	Students will understand the principles of typical thermal analysis such as thermogravimetric analysis and differential scanning calorimetry, the information obtained, and how to interpret the data.
		11th	Mechanical strength analysis	Students will understand the principles of strength measurement equipment, the information obtained, and how to interpret the data.
		12th	Microscopic observation	Students will understand the principles of typical microscopic observations such as SEM and TEM, the information obtained, and how to interpret the data.
		13th	Surface Analysis	Students will understand the principles of typical surface analysis such as XPS, the information obtained, and how to interpret the data.
		14th	X-ray analysis	Students will understand the principles of typical X-ray analysis such as XRD, the information obtained, and how to interpret the data.
		15th	final exams	
		16th	Returning exams, General summary	Reviewing the previous lectures, we will deepen the discussion on how to handle and evaluate various functional materials.

## Evaluation Method and Weight (%)

	Examination	Presentation	Mutual Evaluations between students	Behavior	Portfolio	Other	Total
Subtotal	50	0	0	0	0	50	100
Basic Proficiency	0	0	0	0	0	0	0
Specialized Proficiency	50	0	0	0	0	50	100
Cross Area Proficiency	0	0	0	0	0	0	0

Tsuyama College		Year	2021	Course Title	General Aspects of Engineering II
Course Information					
Course Code	0004		Course Category	Specialized / Elective	
Class Format	Lecture		Credits	Academic Credit: 2	
Department	Advanced Mechanical and Control System Engineering Course		Student Grade	Adv. 1st	
Term	Second Semester		Classes per Week	2	
Textbook and/or Teaching Materials	Textbook: Do not specify, and distribute reference materials in a timely manner during class.				
Instructor	TAKAGI Kenji				
Course Objectives					
Content of study : Recent technological innovations have facilitated the intracellular design of biofunctional materials. In addition, detailed examination of the fine structure is progressing by analysis methods including X-ray crystal structure analysis, NMR structure analysis and various structure predictions. Against this background, it is possible to regard biofunctional materials as extremely minute precision machines that work inside cells, and it is possible to develop existing mechanical engineering theories. In this subject, we will deepen our understanding of machines and control systems from the perspective of functional materials science, such as the properties and handling of biofunctional materials such as proteins.					
Rubric					
	Excellent	Good	Acceptable	Not acceptable	
Achievement 1	The properties and adjustment method of biofunctional materials can be fully explained by giving concrete examples.	Be able to fully explain the properties and adjustment methods of biofunctional materials.	Explain the properties of biofunctional materials.	You have not reached the left.	
Achievement 2	The structural and thermodynamic analysis methods of biofunctional materials can be fully explained by giving concrete examples.	Be able to fully explain the structural and thermodynamic analysis methods of biofunctional materials.	Explain structural and thermodynamic analysis methods for biofunctional materials.	You have not reached the left.	
Achievement 3	The design method of new biofunctional materials can be fully explained by giving concrete examples.	Be able to fully explain how to design new biofunctional materials.	Explain how to design new biofunctional materials.	You have not reached the left.	
Assigned Department Objectives					
Teaching Method					
Outline	<p>General or Specialized : Specialized</p> <p>Foundational academic disciplines : Materials science, strength of materials, thermodynamics, measurement engineering</p> <p>Relationship with Educational Objectives : This class is equivalent to "(1) Cultivate human creative talent, rich in practical abilities".</p> <p>Relationship with JABEE programs : The main goals of learning / education in this class are "(A) A-1.</p> <p>Course outline : Bioengineering has expanded not only to the fields of life science such as biology, medicine and agriculture, but also to bioengineering based on mechanical engineering. The core technologies are genetic engineering, tissue engineering and biomimetics. In this lecture, we will systematically explain from the basic explanation of these to the applied technology.</p>				
Style	<p>Course method : I will explain the main points while explaining on the board etc. based on the handouts. Timely, report assignments will be given according to the content of the lesson, and review and self-study will be encouraged.</p> <p>Grade evaluation method : The score of the final exam (70%) is evaluated by adding the reports up to each regular exam (30%). No retest will be conducted.</p>				
Notice	<p>Precautions on the enrollment : This is a class that requires study outside of class hours. A total of 45 hours of study is required per credit, including both class time and study outside class time. Follow the instructions of the instructor regarding study outside of class hours.</p> <p>Course advice : It is recommended that you refer to the literature to learn more about the part of the lecture that interests you.</p> <p>Foundational subjects : Biology I (1st year), Chemistry I (2nd), Chemistry II (3rd), Applied Biology (4th), Applied Chemistry (4th)</p> <p>Related subjects : Biotechnology (MS-1 or EC-1)  科目名の英語表記は教育課程表 (英語版) で確認。それぞれ最初の科目のみ "year" まで書く。  例 : "Japanese IV (4th year), Theory of Japanese Culture (4th)</p> <p>Attendance advice :</p>				
Characteristics of Class / Division in Learning					
<input type="checkbox"/> Active Learning		<input type="checkbox"/> Aided by ICT		<input checked="" type="checkbox"/> Applicable to Remote Class	
				<input type="checkbox"/> Instructor Professionally Experienced	
Elective subjects					
Course Plan					
			Theme	Goals	

2nd Semester	3rd Quarter	1st	guidance	
		2nd	Overview of biofunctional materials engineering	Outline of biofunctional materials engineering
		3rd	What is a biofunctional material?	Understand the types and categories of biofunctional materials.
		4th	Properties and handling of biofunctional materials	Understand the properties of biofunctional materials and how to handle them.
		5th	How to make biofunctional materials	Understand the general principles and methods of preparing biofunctional materials.
		6th	Mechanism of manufacturing equipment for biofunctional materials	Understand the mechanism of equipment for producing biofunctional materials.
		7th	Purification of actual biofunctional materials	It is manufactured using an actual biofunctional material.
		8th	Microstructure of biofunctional materials	Understand the microstructure of biofunctional materials.
	4th Quarter	9th	Structural analysis method for biofunctional materials 1	Understand X-ray diffraction as a method for analyzing the microstructure of biofunctional materials.
		10th	Structural analysis method for biofunctional materials 2	Understand nuclear magnetic resonance as a method for analyzing the microstructure of biofunctional materials.
		11th	Thermodynamic properties of biofunctional materials	Understand the functional analysis of biofunctional materials.
		12th	Functionally advanced design of biofunctional materials	Understand the advanced and improved design of biofunctional materials.
		13th	Functional sophistication method for biofunctional materials	Understand the actual method of advanced and improved design of biofunctional materials.
		14th	Bioreactor design and operation	Understanding how to obtain large quantities of biofunctional materials.
		15th	Final exam	
		16th		Test return

#### Evaluation Method and Weight (%)

	Examination	Presentation	Mutual Evaluations between students	Behavior	Portfolio	Other	Assignment	Total
Subtotal	70	0	0	0	0	0	30	100
Basic Proficiency	0	0	0	0	0	0	0	0
Specialized Proficiency	70	0	0	0	0	0	30	100
Cross Area Proficiency	0	0	0	0	0	0	0	0

Tsuyama College		Year	2021		Course Title	Thesis Work I
Course Information						
Course Code	0005		Course Category	Specialized / Compulsory		
Class Format	Experiment		Credits	School Credit: 8		
Department	Advanced Mechanical and Control System Engineering Course		Student Grade	Adv. 1st		
Term	Year-round		Classes per Week	8		
Textbook and/or Teaching Materials						
Instructor	SHIBATA Norito,YAMAGUCHI Daizo,MAEZAWA Takanobu,KONISHI Daijiro,INOUE Hiroyuki,HOSOTANI Kazunori,NISHIKAWA Kotaro					
Course Objectives						
Learning purpose: Obtain the skills to identify engineering and technical problems and to solve them concretely, and to gain the basic knowledge and design skills as an engineer.						
Course Objectives						
1. Using ICT and ICT tools to collect and analyze information in the technical field of specialization to obtain an overview of trends in advanced technology, and to understand the objective of research.						
2. Form a research plan independently, conduct the experiments and analysis in details and evaluate the validity of the results.						
3. Exchange opinions and ideas with many engineers through research presentations at academic conferences and practical training outside the school.						
4. Contribute to the local community and the world by recognizing the responsibility that engineers bear to society and by developing the ability to evaluate corporate activities from multiple perspectives.						
Rubric						
	Excellent	Good	Acceptable	Unacceptable		
Achievement 1	Confirm relationship between technology and research trends by collecting, arranging, and analyzing essential information, and understand the purpose of research in relation to these trends.	Evaluate literature and materials collected through own survey and utilize the information. Think about whether the information is correct or not, and to be able to utilize it based on the literature and materials obtained through one's own investigation.	Can explain the details of documents and materials that I studied.	Cannot explain the details of documents and materials studied.		
Achievement 2	Can make plans for special research projects to solve engineering problems and analyze and explain logically.	Can make a research plan based on research objectives, and logically explain the methods and results of testing and evaluating assumptions and surveys.	Can make a research plan based on research objectives and explain the methods and results of testing and evaluating assumptions and surveys.	Cannot make a research plan based on research objectives and explain the methods and results of testing and evaluating assumptions and surveys.		
Achievement 3	Can explain opinion clearly within a time limit using basic forms of effective presentation.	Can give a presentation using basic presentation forms.	Understand basic presentation forms.	Cannot give a basic presentation.		
Achievement 4	Understand the responsibility that engineers have to society based on the impact of technology on society and nature. Make own career design and evaluate the potential fit with the company from multiple criteria.	Understand the responsibility that engineers have to society based on the impact of technology on society and nature and keep continuously improvement to become an engineer.	Can describe the responsibilities that engineers bear to society.	Cannot explain the responsibilities that engineers bear to society.		
Assigned Department Objectives						
Teaching Method						

Outline	<p>*Relationship with practical work In this course, practical training at private companies outside the school (off-campus practical training) is required as part of this subject. 30-hour off-campus practical training has been designed to get deepen knowledge and improve their research skills so that they are not disconnected from the technologies handled in the real world.</p> <p>*General or specialized: Specialized *Field of study: Experiments and practical training, *Foundational academic disciplines: Engineering / Mechanical Engineering / Control Engineering *Relationship with Educational Objectives : This subject is equivalent to "(4) By actively carrying out specialty research the student has developed the indispensable ability to solve problems and find solutions, and can creatively design and undertake research, communicate and cooperate effectively with other researchers, and present findings at academic conferences."</p> <p>*Relationship with JABEE programs : The main goals of learning / education in this class are "(E), E-1", also "A-3", "C-1", "D-1", "D-3", "E-2", "E-3", "F-1", "G-2" and "H-2" are involved. In this course, students will be involved in the development of the following abilities; "Conceptual ability in design skills", "Ability to identify problems", "Ability to recognize problems from the perspective of public health and safety, culture, economy, environment, and ethics", "Ability to find a solution under the constraints arising from these problems", "Ability to express the concept in diagrams, sentences, formulas, programs, etc.", "Ability to plan and implement continuously". In addition, students are required to attend a lecture on engineering ethics.</p> <p>*Course outline: Students will develop the ability to identify and solve problems on their own, as well as the ability to deepen their knowledge and research and development skills through distinctive research themes. Learning outcomes will be submitted as a summary of the mid-term presentation. Students will make external presentations at academic conferences, etc. as necessary.</p>
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Style	<p>Class procedures and course content and methods Method of the class Under the supervision of a faculty advisor, students will conduct experimental or analytical research independently on each research theme. Students will be instructed and advised on how to progress in the engineering research, how to write scientific and technical papers, and how to make presentations and discussions.</p> <p>Grading Method In the first year of the course, students will be evaluated by their supervisors and other instructors based on the conditions indicated in the course plan. In this course, students will be required to make a presentation of the theme (10%), and a presentation on the practical training outside the school (submission of presentation materials and implementation of presentation) (10%). In addition, the preparation of the midterm presentation (outline, preliminary draft) and the report on the lecture on engineering ethics will be considered as professional competence (70%), and the internship report will be considered as cross-disciplinary competence (10%). In the evaluation, the level of achievement will be evaluated for each item of (A) and (C) to (H) of the educational program, and the student will pass if the total evaluation score is 60% or more. If the evaluation score does not reach the passing score, guidance will be given and re-evaluation may be conducted.</p>
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Notice	<p>Note: This course is a "subject that requires study outside of class hours." A total of 45 hours of study is required per credit, including both the relevant class hours and study outside class hours. Students are required to follow the instructions of their instructors regarding study outside of class hours.</p> <p>Advice for students: An extremely large amount of time is allotted for this course. Students are expected to conduct research activities independently in order to maximize the results in the given environment. As preparatory studies, students are expected to make full use of the knowledge they have learned so far to plan their research projects, find out the status of their research in the field, survey relevant references, acquire experimental and analytical techniques, summarize and discuss the results, prepare papers and reports, and prepare presentations.</p> <p>Basic subjects: All subjects that have been studied so far Students are required to do preparatory studies and experiments as instructed by the instructor.</p> <p>Advice on taking this course: This is the most important and main course in the major. Therefore, students are expected to take the initiative and do their best in all aspects of the course. In the second year, students are required to submit a "Course Plan for the Integrated Studies" and "Summary of the Results of the Integrated Studies" in order to obtain a bachelor's degree from the National Institution for Academic Degrees and University Evaluation. In addition to the above, it is necessary for students to submit a research plan and a summary of the results of their studies when they receive a bachelor's degree from the National Institution for Academic Degrees and University Evaluation. Also, students are required to submit a research record at the end of the first and second semesters.</p>
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#### Characteristics of Class / Division in Learning

<input checked="" type="checkbox"/> Active Learning	<input checked="" type="checkbox"/> Aided by ICT	<input type="checkbox"/> Applicable to Remote Class	<input type="checkbox"/> Instructor Professionally Experienced
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#### Required subjects

#### Course Plan

			Theme	Goals
1st Semester	1st Quarter	1st	Guidance	Recognize one's current situation at any time and consider the studies and activities that are currently necessary in order to move toward a desired future state.
		2nd	Research theme and research plan	Collect necessary information appropriately from books, the Internet, and questionnaires.
		3rd	Research theme and research plan	Select, organize, classify, and use the collected information.

2nd Semester		4th	Research theme and research plan	Know that it is necessary to consider the reliability and accuracy of collected and cited sources of information.
		5th	Research theme and research plan	Know that they are responsible for the content and scope of influence of the information they disseminate.
		6th	Research theme and research plan	Know that you must take personal information and copyright into consideration when disseminating information.
		7th	Research theme and research plan	Collect information in order to recognize the difference between the ideal state and the current state (issues).
		8th	Research theme and research plan	Organize and compose multiple pieces of information.
	2nd Quarter	9th	Theme Presentation	Correctly transmit (present) information using tools and methods appropriate to the purpose and target audience.
		10th	Trial and verification of experiments and analysis	Read and understand texts in Japanese and certain foreign languages.
		11th	Trial and verification of experiments and analysis	Write correctly in Japanese or a specific foreign language to communicate with others.
		12th	Trial and verification of experiments and analysis	Understand what others say in Japanese and in specific foreign languages.
		13th	Trial and verification of experiments and analysis	Understand the purpose of a conversation and carry it out in Japanese or a specific foreign language.
		14th	Trial and verification of experiments and analysis	Draw charts and graphs for smooth communication.
		15th	Trial and verification of experiments and analysis	Adopt attitudes (affirmation, repetition, body language, etc.) for smooth communication.
		16th	Trial and verification of experiments and analysis	Able to listen to others' opinions and build consensus.
2nd Semester	3rd Quarter	1st	Trial and verification of experiments and analysis	Learn consensus-building conversations.
		2nd	Trial and verification of experiments and analysis	Practice specific methods for consensus building, such as group work and workshops.
		3rd	Trial and verification of experiments and analysis	Understand and be able to practice the purpose and preparation for experiments and practical training.
		4th	Trial and verification of experiments and analysis	Understand and be able to practice what should be done to prevent disasters and ensure safety.
		5th	Trial and verification of experiments and analysis	Use diagrams and tables such as characteristic factor diagrams, tree diagrams, and logic trees, which are effective in finding problems and analyzing the current situation.
		6th	Trial and verification of experiments and analysis	Understand that problem solving requires consideration of logical procedures, not intuition or common sense.
		7th	Trial and verification of experiments and analysis	Think logically and rationally to solve problems through group work and workshops, using all kinds of techniques such as brainstorming.
		8th	Trial and verification of experiments and analysis	Identify engineering problems in a logical and rational manner.
	4th Quarter	9th	Trial and verification of experiments and analysis	Explain to others the thought process that led to the conclusion.
		10th	Trial and verification of experiments and analysis	Propose solutions of appropriate scope and level.
		11th	Trial and verification of experiments and analysis	Develop logic and thinking based on facts.
		12th	Trial and verification of experiments and analysis	Express the logic of the process of reaching conclusions using words, sentences, charts, etc.
		13th	Trial and verification of experiments and analysis	Act in compliance with laws and rules.
		14th	Trial and verification of experiments and analysis	Act with consideration for the circumstances of others.
		15th	Trial and verification of experiments and analysis	Recognize the impact and effects of technology on society and nature and be able to enhance the responsibility that engineers should bear to society.
		16th	Trial and verification of experiments and analysis	Understand how to write reports and be able to put them into practice.

#### Evaluation Method and Weight (%)

	Examination	Presentation	Mutual Evaluations between students	Self evaluation	Research task	Other	Total
Subtotal	0	20	0	0	80	0	100
Basic Proficiency	0	0	0	0	0	0	0
Specialized Proficiency	0	10	0	0	70	0	80

Cross Area Proficiency	0	10	0	0	10	0	20
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Tsuyama College		Year	2021		Course Title	Information Science
Course Information						
Course Code	0009		Course Category	Specialized / Elective		
Class Format	Lecture		Credits	Academic Credit: 2		
Department	Advanced Mechanical and Control System Engineering Course		Student Grade	Adv. 1st		
Term	Second Semester		Classes per Week	2		
Textbook and/or Teaching Materials	Physics Simulation with HTML5					
Instructor	TERAMOTO Takayuki					
Course Objectives						
Learning purposes : Students will systematically learn the basics of physical simulation, and learn about the basic concepts behind it, visualization technology, HTML5, and its operation and design methods. Based on the lecture, each student will actually study and design the system. In addition, students will learn specific application techniques through actual computer exercises.						
Course Objectives : 1. To be able to systematically understand and calculate the basics of physical simulation. 2. To be able to use HTML5 as a tool for scientific communication. 3. To be able to solve problems by using appropriate techniques and tools.						
Rubric						
	Excellent	Good	Acceptable	Not acceptable		
Achievement 1	Understand the fundamentals of physical simulation systematically and be able to explain and apply them to others.	Have some understanding of the basics of physical simulation and be prepared to apply it.	Understand at least the basics of physical simulation and can solve basic problems.	Does not meet the requirements of the left.		
Achievement 2	HTML5 can be applied as a tool for science communication.	Understand and to some extent use HTML5 as a tool for science communication.	Understand and minimally use HTML5 as a science communication tool.	Does not meet the requirements of the left.		
Achievement 3	Be able to solve problems in an exemplary manner using appropriate techniques, tools, etc. for a given problem.	Be able to use appropriate technology, tools, etc. to solve the problem to some extent for a given issue.	Be able to use appropriate technology, tools, etc. to solve the problem at a minimum required for a given problem.	Does not meet the requirements of the left.		
Assigned Department Objectives						
Teaching Method						
Outline	General or Specialized : Specialized  Field of learning : Lecture  Foundational academic disciplines : Information science, information engineering and related fields/computational science related  Relationship with Educational Objectives :This class is equivalent to "(2) Acquire basic science and technical knowledge".  Relationship with JABEE programs :The main goals of learning / education in this class are "(C)Mastery of information technology, C-1", also "A-1, " and "C-2" is involved.  Course outline : With the development of computer and communication technologies, computers have been incorporated in various fields, and IT (information technology) of systems has become indispensable. In this lecture, we aim to acquire basic information technology, focusing on physical simulation technology for describing real-world information in a computer, which is an important technology for constructing information systems.					
Style	Course method :The class will be based on students' preliminary exercises and their presentations. In this course, students are expected to acquire all the knowledge necessary for information processing. Students are required to write reports to deepen their understanding. In addition, presentations and presentations will be given so that students can organize and present the information they have compiled.  Grade evaluation method : Planning and execution of exercises and submission of assignments 50%. Participation in the presentation and discussion 40%. Results of peer evaluation of presentations and submitted assignments 10%.					



Notice	Precautions on the enrollment : This is a class that requires study outside of class hours. A total of 45 hours of study is required per credit, including both class time and study outside class time. Follow the instructions of the instructor regarding study outside of class hours.
	Course advice : Please try to make use of it in your own research activities. As a preparatory study, please refer to "Introduction" in the textbook to understand the outline and download and install the related software.
	Foundational subjects : Courses and exercises related to information processing in each department
	Related subjects : Engineering Ethics (1st year), Seminar for Basic Information Processing I (1st year), Seminar for Basic Information Processing II (1st year), Seminar for Applied Information Processing I (1st year), Seminar for Applied Information Processing II (1st year), Advanced Numerical Analysis (2nd year)
	Attendance advice : The contents are independent of each other, so that students can study by themselves from anywhere. Due to the nature of the course, it is not necessarily necessary to be familiar with all the topics, but the focus is on information processing techniques that are necessary for engineers to write reports and papers and to present at conferences. Students are encouraged to deepen the necessary parts according to their own themes. It is necessary to get used to the environment of the exercises, and at the same time, it is necessary to make efforts to establish an environment where similar exercises can be performed in each laboratory.

### Characteristics of Class / Division in Learning

<input type="checkbox"/> Active Learning	<input type="checkbox"/> Aided by ICT	<input type="checkbox"/> Applicable to Remote Class	<input type="checkbox"/> Instructor Professionally Experienced
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### Course Plan

			Theme	Goals
2nd Semester	3rd Quarter	1st	General explanation and exchange of information with Basic Information Processing Exercise I [Guidance].	Understanding the Overview
		2nd	Registration in the exercise system and setting of personal information and exercise environment [Setting].	Checking the exercise environment
		3rd	Introduction to 3D Computer Graphics (3D Objects)	Understand 3D objects and be able to explain them through exercises
		4th	Introduction to 3D Computer Graphics (Primitive Objects)	Understand primitive objects and be able to explain them through exercises.
		5th	Introduction to 3D Computer Graphics (Shadows and Light Sources)	Understand shadows and light sources and be able to explain them through exercises.
		6th	Introduction to 2D graphic depiction (basic form of jqPlot)	Understand the basic form of jqPlot and be able to explain it through exercises.
		7th	Introduction to 2D graphic depiction (jqPlot options)	Understand the options of jqPlot and be able to explain them through exercises.
		8th	Introduction to 2D graphic depiction (jqPlot options)	Understand the options of jqPlot and be able to explain them through exercises.
	4th Quarter	9th	Physical simulation (basic concept)	Understand the basic concepts and be able to explain them through exercises. Physical simulation (basic concept)
		10th	Physical simulation (objects in 3-D space)	Understand objects in three-dimensional space and be able to explain them through exercises.
		11th	Physical simulation (algorithm for constant velocity motion)	Understand the algorithm of constant velocity motion and be able to explain it through exercises.
		12th	Physical simulation (algorithms for accelerated motion)	Understand the algorithm of accelerated motion and be able to explain it through exercises. Physical simulation (algorithms for accelerated motion)
		13th	Physical simulation (high-precision computational algorithms)	Understand high-precision computational algorithms and be able to explain them through exercises.
		14th	Physical simulation (Newton's equations of motion) Understand high-precision computational algorithms and be able to explain them through exercises.	Understand Newton's equations of motion and be able to explain them through exercises.
		15th		
		16th		

### Evaluation Method and Weight (%)

	Examination	Presentation	Mutual Evaluations between students	Behavior	Problem	Other	Total
Subtotal	0	40	10	0	50	0	100
Basic Proficiency	0	0	0	0	0	0	0
Specialized Proficiency	0	40	10	0	50	0	100

Cross Area Proficiency	0	0	0	0	0	0	0
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Tsuyama College		Year	2021	Course Title	Basic Practice in Information Processing I
Course Information					
Course Code	0010		Course Category	Specialized / Elective	
Class Format	Lecture		Credits	School Credit: 1	
Department	Advanced Mechanical and Control System Engineering Course		Student Grade	Adv. 1st	
Term	First Semester		Classes per Week	2	
Textbook and/or Teaching Materials					
Instructor	TAKETANI Hisashi				
Course Objectives					
<p>Learning purposes : Improvement of the programming skill which can be utilized for a study and improvement of the computer literacy ability by which a Web page is making.</p> <p>Course Objectives :  1. The student can understand information ethics and utilize information machinery effectively.  2. The student can understand mechanism of a Web page and make each Web page.  3. It's possible to understand and utilize basic knowledge about the information field which can fit each field.</p>					
Rubric					
	Excellent	Good	Acceptable	Not acceptable	
Achievement 1	The student can utilize information machinery effectively based on right information ethics.	The student can understand information ethics and utilize information machinery.	A student can utilize information machinery.	The student dose not reach the following.	
Achievement 2	The student can explain mechanism of a Web page, and it can be utilized effectively.	The student makes and exhibits a Web page.	The student makes a Web page.	The student dose not reach the following.	
Achievement 3	The student can utilize knowledge about the information field which can fit each field.	The student can explain basic knowledge about the information field which can fit each field specifically.	The student can explain the outline of basic knowledge about the information field which can fit each field.	The student dose not reach the following.	
Assigned Department Objectives					
Teaching Method					
Outline	<p>General or Specialized : Specialized Field of learning : Information, measurement and control Foundational academic disciplines : Overall territory/ informatics/ computer system network</p> <p>Relationship with Educational Objectives : This class is equivalent to "(2) Knowledge of specialized field technology is acquired and the ability which can be utilized for a design of a machine and a system, a policy and practical use is learned".</p> <p>Relationship with JABEE programs : The main goal of learning / education in this class is "(C) and (C-1)", also "(A-1) and (C-2)" is involved.</p> <p>Course outline : Today called information-technology age and improvement of the computer literacy ability as the everyday tool are e-mailed to the purpose, and the rule when using it for various operation method and information ethics, is learned in order to utilize a computer and a network such as utilization of information, information sending and a programming on the internet.</p>				
Style	<p>Course method : The student maneuvers by a PC in the application seminar room in an overall information center mainly.</p> <p>Grade evaluation method : The understanding and the accomplishment which face each problem (report and work), 80% and announcement 20%</p>				
Notice	<p>Precautions on the enrollment : This class is "subject which requires learning in schooltime outside". Learning for 45 hours is needed per a semester hour together with learning outside the schooltime concerned and the schooltime. Follow directions of a teacher in charge about learning in schooltime outside.</p> <p>Course advice :  1. Review the contents of a subject and a practice related to information processing technology of each department as the learning of preparations performed beforehand.  2. It's possible to take one of Basic practice II in Information processing or Applied practice II in information processing in the latter period.</p> <p>Foundational subjects : Subject and practice related to information processing technology of each department</p> <p>Attendance advice : When it's within class starting for 20 minutes, it's made lateness and 1 deficit is done with the department by 3 times of lateness.</p>				
Characteristics of Class / Division in Learning					
<input type="checkbox"/> Active Learning		<input checked="" type="checkbox"/> Aided by ICT		<input type="checkbox"/> Applicable to Remote Class	
				<input type="checkbox"/> Instructor Professionally Experienced	
Elective Subjects					
Course Plan					

			Theme	Goals
1st Semester	1st Quarter	1st	Guidance and system configuration in an overall information center.	Understanding of a system configuration in an overall information center.
		2nd	Notice of network use and use of an e-mail	Notice of network use and use of an e-mail
		3rd	Investigation about the problem for using the internet	Investigation about the problem for using the internet
		4th	Investigation report and discussion	Investigation report and discussion
		5th	About the kanji used on the computer.	About the kanji used on the computer.
		6th	Basis of a programming (1)	Basis of a programming
		7th	Basis of a programming (2)	Basis of a programming
		8th	Basis of a programming (3)	Basis of a programming
	2nd Quarter	9th	Basis of a programming (4)	Basis of a programming
		10th	Programming problem (1)	Programming problem
		11th	Programming problem (2)	Programming problem
		12th	About markup language for Web page.	About markup language for Web page.
		13th	Making of an easy Web page	Making of an easy Web page
		14th	Making of a Web page about each study (1)	Making of a Web page about each study
		15th	Making of a Web page about each study (2)	Making of a Web page about each study
		16th	Revival of a home page with a movement, a CGI, sound and an animation	Revival of a home page with a movement, a CGI, sound and an animation

#### Evaluation Method and Weight (%)

	Examination	Presentation	Mutual Evaluations between students	Behavior	Portfolio	Other	Total
Subtotal	0	20	0	0	80	0	100
Basic Proficiency	0	0	0	0	0	0	0
Specialized Proficiency	0	20	0	0	80	0	100
Cross Area Proficiency	0	0	0	0	0	0	0

Tsuyama College		Year	2021		Course Title	Practice in Information Processing I
Course Information						
Course Code	0011		Course Category	Specialized / Elective		
Class Format	Lecture		Credits	School Credit: 1		
Department	Advanced Mechanical and Control System Engineering Course		Student Grade	Adv. 1st		
Term	First Semester		Classes per Week	2		
Textbook and/or Teaching Materials						
Instructor	TERAMOTO Takayuki					
Course Objectives						
Learning purposes : To acquire information processing skills through exercises and to deepen the knowledge and skills necessary to judge and evaluate information.						
Course Objectives : 1. To be able to create the necessary documents for each research topic. 2. To be able to use spreadsheet software to organize data and create effective graphs for their own research topics. 3. To be able to solve problems for given tasks.						
Rubric						
	Excellent	Good	Acceptable	Not acceptable		
Achievement 1	To be able to prepare documents at the level to be submitted to academic conferences on their own research topics.	To be able to prepare documents in accordance with the format of academic conferences on their own research topics.	To be able to prepare a reformatted document on your research topic.	Cannot create a document on his/her own research topic that meets the purpose.		
Achievement 2	Be able to use spreadsheet software to organize data and create effective graphs on their own research topics at a level that can be used in papers.	To be able to use spreadsheet software to organize general data and create effective graphs for their own research topics.	To be able to use spreadsheet software to organize data and create effective graphs for their own research topics to some extent.	Cannot organize data and create effective graphs using spreadsheet software in relation to their own research theme		
Achievement 3	To be able to solve problems by fully utilizing software for a given task.	To be able to use software to solve a given problem.	To be able to propose a solution to a given problem by using software.	Cannot solve a problem or propose a solution to a given problem.		
Assigned Department Objectives						
Teaching Method						
Outline	General or Specialized : Specialized					
	Field of learning : Experiment and practice					
	Foundational academic disciplines : Information science, information engineering and related fields/ Statistical science related, computer systems related, software related					
	Relationship with Educational Objectives :This class is equivalent to "(2) Acquire basic science and technical knowledge".					
	Relationship with JABEE programs :The main goals of learning / education in this class are "(C)Mastery of information technology, C-1", also "A-1, " and "C-2" is involved.					
Style	Course outline : Information retrieval, organization, management and integration, presentation, and information dissemination using information technology are the literacy skills of modern engineers. In this course, students who have already mastered the basic literacy skills are given exercises to acquire more advanced application skills, customization skills, and expression skills.					
	Course method :The class will be conducted mainly through exercises. Exercises will be conducted so that students can acquire the overall knowledge required for information processing. Students are required to write reports to deepen their understanding. In addition, students will make presentations and presentations to organize and present the information they have compiled.					
	Grade evaluation method : Planning and execution of exercises and submission of assignments 50%. Participation in the presentation and discussion 40%. Results of peer evaluation of presentations and submitted assignments 10%.					

Notice	Precautions on the enrollment : This is a class that requires study outside of class hours. A total of 45 hours of study is required per credit, including both class time and study outside class time. Follow the instructions of the instructor regarding study outside of class hours.
	Course advice : This course cannot be taken at the same time as Seminar in Fundamental Information Processing I. However, it is possible to take Seminar in Fundamental Information Processing II or Seminar in Applied Information Processing II. As a preparatory study to be done in advance, research information on the papers of the conference to which you belong. In addition, review how to use the seminar room.
	Foundational subjects : Courses and exercises related to information processing in each department
	Related subjects : Engineering Ethics (1st year), Information Processing Application Exercise II (1st year), Information Processing Basic Exercise II (1st year)
	Attendance advice : The contents are independent of each other, so that students can study by themselves from anywhere. Due to the nature of the course, it is not necessarily necessary to be familiar with all the topics, but the focus is on information processing techniques that are necessary for engineers to write reports and papers and to present at conferences. Students are encouraged to deepen the necessary parts according to their own themes. It is necessary to get used to the environment of the exercises, and at the same time, it is necessary to make efforts to establish an environment where similar exercises can be performed in each laboratory.

### Characteristics of Class / Division in Learning

<input type="checkbox"/> Active Learning	<input type="checkbox"/> Aided by ICT	<input type="checkbox"/> Applicable to Remote Class	<input type="checkbox"/> Instructor Professionally Experienced
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### Elective Subjects

### Course Plan

			Theme	Goals
1st Semester	1st Quarter	1st	General explanation and exchange of information with Basic Information Processing Exercise I [Guidance].	Understanding the Overview
		2nd	Registration in the exercise system and setting of personal information and exercise environment [Setting].	Able to set up the exercise environment and start the exercise.
		3rd	Exercises to master basic document creation techniques (formatting, document style unification).	Understand basic document creation techniques (formatting, document style unification) and confirm the contents through exercises.
		4th	Exercises to master the basic techniques of document creation (cross-referencing).	Understand the basic techniques of document creation (cross-referencing) and confirm their content through exercises
		5th	Exercises to master basic document creation techniques (image processing, etc.).	Understand basic document creation techniques (e.g., image processing) and confirm their contents through exercises.
		6th	Workflow creation exercise.	Understand the creation of a workflow and confirm its contents through exercises.
		7th	Exercises with free software, including creating PDF files.	Understand free software, such as PDF file creation, and review its contents through exercises. Exercises with free software, including creating PDF files.
		8th	Exercises in basic spreadsheet software techniques and macro language (1)	To understand the basic skills of spreadsheet software and exercise 1 macro language, and to confirm the contents through exercises.
	2nd Quarter	9th	Exercises in basic spreadsheet software techniques and macro language (2)	To understand the basic skills of spreadsheet software and exercise 2 of macro language, and to confirm the contents in the exercise
		10th	Exercises in spreadsheet software applications (1)	Understand spreadsheet application example exercises and confirm their content through practice.(1)
		11th	Exercises in spreadsheet software applications (2)	Understand spreadsheet application example exercises and confirm their content through practice.(2)
		12th	Exercises in spreadsheet software applications (3)	Understand spreadsheet application example exercises and confirm their content through practice.(3)
		13th	Preparation and presentation of a comprehensive assignment (1)	Comprehensive presentation to confirm understanding and mutual evaluation.(1)
		14th	Preparation and presentation of a comprehensive assignment (2)	Comprehensive presentation to confirm understanding and mutual evaluation.(2)
		15th		
		16th		

### Evaluation Method and Weight (%)

	Examination	Presentation	Mutual Evaluations between students	Behavior	Problem	Other	Total
Subtotal	0	40	10	0	50	0	100
Basic Proficiency	0	0	0	0	0	0	0
Specialized Proficiency	0	40	10	0	50	0	100

Cross Area Proficiency	0	0	0	0	0	0	0
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Tsuyama College		Year	2021	Course Title	Basic Practice in Information Processing II
Course Information					
Course Code	0012		Course Category	Specialized / Elective	
Class Format	Lecture		Credits	School Credit: 1	
Department	Advanced Mechanical and Control System Engineering Course		Student Grade	Adv. 1st	
Term	Second Semester		Classes per Week	2	
Textbook and/or Teaching Materials					
Instructor	TAKETANI Hisashi				
Course Objectives					
<p>Learning purposes :</p> <p>A basis of a system of UNIX and the command and a shell script are acquired.</p> <p>Beginner's course acquisition of Visio (figure making software with the high function)</p> <p>Course Objectives :</p> <p>1. The student can acquire a basis of UNIX and utilize programming environment for a problem solution.</p> <p>2. It's possible to utilize numerical formula processing software and physical simulation software.</p> <p>3. An electric circuit and a network figure can be made in Visio.</p>					
Rubric					
	Excellent	Good	Acceptable	Not acceptable	
Achievement 1	The UNIX environment can be put to good use in a problem solution.	The student can acquire a basis of UNIX and utilize programming environment.	The student can use programming environment on UNIX.	The student dose not reach the following.	
Achievement 2	The student can utilize appropriate software and do a problem solution.	The A student can utilize numerical formula processing software and physical simulation software.	The student can use numerical formula processing software and physical simulation software.	The student dose not reach the following.	
Achievement 3	The student can utilize VISIO for each problem solution.	The student can draw an electric circuit and a network figure using VISIO.	The student can draw basic electric circuit and network figure using VISIO.	The student dose not reach the following.	
Assigned Department Objectives					
Teaching Method					
Outline	<p>General or Specialized : Specialized</p> <p>Field of learning : Information, measurement and control</p> <p>Foundational academic disciplines : Overall territory/ informatics/ computer system network</p> <p>Relationship with Educational Objectives :</p> <p>This class is equivalent to "(2) Knowledge of specialized field technology is acquired and the ability which can be utilized for a design of a machine and a system, a policy and practical use is learned".</p> <p>Relationship with JABEE programs :</p> <p>The main goal of learning / education in this class is "(C) and (C-1)", also "(A-1) and (C-2)"is involved.</p> <p>Course outline :</p> <p>The computer literacy ability learned in Basic practice I in Information Processing or Applied practice I in Information Processing is understood about a system of the UNIX which becomes a basis of a computer technology higher the one in a place of learning and a study and the technology with the basic command as a basis. It's also learned about a shell script.</p>				
Style	<p>Course method :</p> <p>The student maneuvers by a PC in the application seminar room in an overall information center mainly.</p> <p>Grade evaluation method :</p> <p>The understanding and the accomplishment which face each problem (report and work), 80% and announcement 20%</p>				
Notice	<p>Precautions on the enrollment :</p> <p>This class is "subject which requires learning in schooltime outside". Learning for 45 hours is needed per a semester hour together with learning outside the schooltime concerned and the schooltime. Follow directions of a teacher in charge about learning in schooltime outside.</p> <p>Course advice :</p> <p>1. Review the contents of I or Basic Practice I in Information Processing and Applied practice I in Information Processing as the learning of preparations performed beforehand.</p> <p>2. Even if it's taken, which can be taken in the first term, Basic Practice I in Information Processing and or Applied practice I in Information Processing.</p> <p>Foundational subjects :</p> <p>Basic Practice I in Information Processing and or Applied practice I in Information Processing.</p> <p>Attendance advice :</p> <p>When it's within class starting for 20 minutes, it's made lateness and 1 deficit is done with the department by 3 times of lateness.</p>				
Characteristics of Class / Division in Learning					
<input type="checkbox"/> Active Learning		<input checked="" type="checkbox"/> Aided by ICT		<input type="checkbox"/> Applicable to Remote Class	
				<input type="checkbox"/> Instructor Professionally Experienced	
Course Plan					



			Theme	Goals
2nd Semester	3rd Quarter	1st	Guidance	
		2nd	Numerical formula processing soft "maxima"	Numerical formula processing soft "maxima"
		3rd	Numerical formula processing by "maxima" Equation, simultaneous equation, procession and differential and integral calculus	Numerical formula processing by "maxima" Equation, simultaneous equation, procession and differential and integral calculus
		4th	Physical simulation by "Phun" (1)	Physical simulation by "Phun"
		5th	Physical simulation by "Phun" (2)	Physical simulation by "Phun"
		6th	Presentation of Physical simulation object	Presentation of Physical simulation object
		7th	CentoOS guide	CentoOS guide
		8th	Environmental improvement on CentoOS	Environmental improvement on CentoOS
	4th Quarter	9th	C programming on CentoOS (1)	C programming on CentoOS
		10th	C programming on CentoOS (2)	C programming on CentoOS
		11th	C programming on CentoOS (3)	C programming on CentoOS
		12th	Basic knowledge about Unix, job control and shell	Basic knowledge about Unix, job control and shell
		13th	File system and behavior of all kinds' command	File system and behavior of all kinds' command
		14th	Shell programming on CentoOS	Shell programming on CentoOS
		15th	File operation by shell	File operation by shell
		16th	Basic operation of Visio	Basic operation of Visio

#### Evaluation Method and Weight (%)

	Examination	Presentation	Mutual Evaluations between students	Behavior	Portfolio	Other	Total
Subtotal	0	20	0	0	80	0	100
Basic Proficiency	0	0	0	0	0	0	0
Specialized Proficiency	0	20	0	0	80	0	100
Cross Area Proficiency	0	0	0	0	0	0	0

Tsuyama College		Year	2021		Course Title	Practice in Information Processing II	
Course Information							
Course Code	0013		Course Category		Specialized / Elective		
Class Format	Lecture		Credits		School Credit: 1		
Department	Advanced Mechanical and Control System Engineering Course		Student Grade		Adv. 1st		
Term	Second Semester		Classes per Week		2		
Textbook and/or Teaching Materials							
Instructor	TERAMOTO Takayuki						
Course Objectives							
Learning purposes : To acquire information processing skills through exercises and to deepen the knowledge and skills necessary to judge and evaluate information.							
Course Objectives : 1. Understand the composition system and be able to create the necessary documents. 2. To be able to create a manual for using the system and to explain how to use it to others. 3. To be able to create appropriate schematics, flowcharts, and Gantt charts for use in papers and other documents.							
Rubric							
	Excellent		Good		Acceptable		Not acceptable
Achievement 1	Understand the typesetting system and be able to create documents at a level that can be submitted to conferences.		Understand the typesetting system and be able to create general documents.		Understand the typesetting system, and be able to create necessary documents to some extent.		Cannot create documents that meet the purpose.
Achievement 2	To be able to write a manual for using the TeX system, and to be able to explain how to use it to others.		To be able to write a manual for using the TeX system and to be able to explain to others how to use it.		To be able to create a manual for using the TeX system.		Cannot write a manual for using the TeX system.
Achievement 3	To be able to create circuit diagrams, flowcharts, Gantt charts, etc. appropriately for given tasks.		To be able to create circuit diagrams, flowcharts, Gantt charts, etc. to some extent for given tasks.		Able to create a circuit diagram, flowchart, Gantt chart, etc. for a given task.		Cannot create a circuit diagram, flowchart, or Gantt chart for a given task.
Assigned Department Objectives							
Teaching Method							
Outline	General or Specialized : Specialized						
	Field of learning : Experiment and practice						
	Foundational academic disciplines : Information science, information engineering and related fields/ Statistical science related, computer systems related, software related						
	Relationship with Educational Objectives :This class is equivalent to "(2) Acquire basic science and technical knowledge".						
	Relationship with JABEE programs :The main goals of learning / education in this class are "(C)Mastery of information technology, C-1", also "A-1, " and "C-2" is involved.						
Style	Course outline : In this class, students who have already mastered basic computer literacy skills are given exercises to acquire more advanced system management skills, teaching skills for beginners, and expressive skills.						
	Course method :The class will be conducted mainly through exercises. Exercises will be conducted so that students can acquire the overall knowledge required for information processing. Students are required to write reports to deepen their understanding. In addition, students will make presentations and presentations to organize and present the information they have compiled.						
Notice	Grade evaluation method : Planning and execution of exercises and submission of assignments 50%. Participation in the presentation and discussion 40%. Results of peer evaluation of presentations and submitted assignments 10%.						
	Precautions on the enrollment : This is a class that requires study outside of class hours. A total of 45 hours of study is required per credit, including both class time and study outside class time. Follow the instructions of the instructor regarding study outside of class hours.						
	Course advice : This course cannot be taken at the same time as Seminar in Fundamental Information Processing I. However, it is possible to take Seminar in Fundamental Information Processing II or Seminar in Applied Information Processing II.As a preparatory study to be done in advance, do some preliminary research on setting up the TeX system environment.						
	Foundational subjects : Courses and exercises related to information processing in each department						
	Related subjects : Engineering Ethics (1st year), Information Processing Application Exercise I (1st year), Information Processing Basic Exercise I (1st year)						
	Attendance advice : The contents are independent of each other, so that students can study by themselves from anywhere. Due to the nature of the course, it is not necessarily necessary to be familiar with all the topics, but the focus is on information processing techniques that are necessary for engineers to write reports and papers and to present at conferences. Students are encouraged to deepen the necessary parts according to their own themes. It is necessary to get used to the environment of the exercises, and at the same time, it is necessary to make efforts to establish an environment where similar exercises can be performed in each laboratory.						

Characteristics of Class / Division in Learning							
<input type="checkbox"/> Active Learning		<input type="checkbox"/> Aided by ICT		<input type="checkbox"/> Applicable to Remote Class	<input type="checkbox"/> Instructor Professionally Experienced		
E l e c t i v e   S u b j e c t s							
Course Plan							
			Theme	Goals			
2nd Semester r	3rd Quarter	1st	Overview [Guidance].	Understanding the Overview			
		2nd	Overview of the TeX system, construction of the learning environment and exercises.(1)	Understand the TeX system and be able to set up an exercise environment.(1)			
		3rd	Overview of the TeX system, construction of the learning environment and exercises.(2)	Understand the TeX system and be able to set up an exercise environment.(2)			
		4th	Learning about the history and technology of plate making systems	Understand the history and technology of typographical systems and be able to confirm the contents through exercises.			
		5th	Exercises on handling metafonts, PostScript fonts and image files (EPS, etc.)	Understand the handling of metafonts, PostScript fonts, and image files (EPS, etc.), and be able to confirm the contents in exercises. Exercises on handling metafonts, PostScript fonts and image files (EPS, etc.)			
		6th	jLaTeX manual writing exercise (1)	Understand the jLaTeX manual and be able to check the contents through exercises.(1)			
		7th	jLaTeX manual writing exercise (2)	Understand the jLaTeX manual and be able to check the contents through exercises.(2)			
		8th	jLaTeX manual writing exercise (3)	Understand the jLaTeX manual and be able to check the contents through exercises.(3)			
	4th Quarter	9th	jLaTeX manual writing exercise (4)	Understand the jLaTeX manual and be able to check the contents through exercises.(4)			
		10th	Create flowcharts and various design drawings using Visio(1)	Understand how to create flowcharts and various types of blueprints using Visio and be able to confirm the contents through exercises(1)			
		11th	Create flowcharts and various design drawings using Visio(2)	Understand how to create flowcharts and various types of blueprints using Visio and be able to confirm the contents through exercises(2)			
		12th	Preparation for lectures on various design drawings using Visio	Understand various design drawings in Visio and be able to confirm the contents through exercises			
		13th	Lecture on various design drawings using Visio(1)	Understand and be able to explain various design drawings in Visio to others(1)			
		14th	Lecture on various design drawings using Visio(2)	Understand and be able to explain various design drawings in Visio to others(2)			
		15th					
		16th	Summarize the exercise and conduct a peer evaluation	Summarize the exercise and conduct a peer evaluation			
Evaluation Method and Weight (%)							
	Examination	Presentation	Mutual Evaluations between students	Behavior	Problem	Other	Total
Subtotal	0	40	10	0	50	0	100
Basic Proficiency	0	0	0	0	0	0	0
Specialized Proficiency	0	40	10	0	50	0	100
Cross Area Proficiency	0	0	0	0	0	0	0

Tsuyama College		Year	2021		Course Title	Linear Algebra
Course Information						
Course Code	0014		Course Category	Specialized / Elective		
Class Format	Lecture		Credits	Academic Credit: 2		
Department	Advanced Mechanical and Control System Engineering Course		Student Grade	Adv. 1st		
Term	First Semester		Classes per Week	2		
Textbook and/or Teaching Materials						
Instructor	MATSUDA Osamu					
Course Objectives						
In this course, you will learn the theory of n-dimensional number vector space. In particular, learn new concepts such as Jordan normal form, quaternions, and groups.						
Acquire the basic idea of the theory of n-dimensional number vector space.						
1. 1. Understand n-dimensional number vector space.						
2. Understand the concept of inner product and distance.						
3. Geometrically explain the difference in space deformation depending on the type of matrix.						
4. Explain the representation matrix and the change of basis.						
5. Understand the concept of Jordan normal form.						
6. Understand quaternions and the rotation of space.						
Rubric						
	Excellent	Good	Acceptable	Not acceptable		
Achievement 1	A good understanding of n-dimensional number vector spaces.	Understand about 70% of the n-dimensional number vector space.	Understand about 60% of the n-dimensional number vector space.	Don't understand the n-dimensional number vector space.		
Achievement 2	A good understanding of inner product and distance.	About 70% have an understanding of inner product and distance.	About 60% have an understanding of inner product and distance.	Don't understand the inner product and distance.		
Achievement 3	It is possible to explain the difference in the deformation of space depending on the type of matrix geometrically and precisely.	Geometrically, about 70% of the differences in spatial deformation depending on the type of matrix can be explained.	Geometrically, about 60% of the differences in spatial deformation depending on the type of matrix can be explained.	It is not possible to geometrically explain the difference in the deformation of space depending on the type of matrix.		
Achievement 4	Explain the representation matrix and the basis basis precisely.	Explain about 70% of representation matrices and basis transformations.	Explain about 60% of representation matrices and basis transformations.	Can't explain the representation matrix and the change of basis.		
Achievement 5	The idea of Jordan normal form is well understood.	About 70% of the Jordan normal form is known.	About 60% of the Jordan normal form is known.	Don't understand the idea of Jordan normal form.		
Achievement 6	A good understanding of quaternions and the rotation of space.	Understand about 70% of quaternions and the rotation of space.	Understand about 60% of quaternions and the rotation of space.	Don't understand the quaternion and the rotation of space.		
Assigned Department Objectives						
Teaching Method						
Outline	General or Specialized : Specialized					
	Field of learning : Natural science Common / Basic					
	Required, Elective: Elective must complete subjects					
	Foundational academic disciplines : Mathematical science / Mathematics / Analysis basics					
	Relationship with Educational Objectives : This subject corresponds to the learning goal "(2) Acquire basic science and technical knowledge".					
	Relationship with JABEE programs : The main goal of learning / education in this class are "(A) , A-1".					
Style	Course method : Focus on understanding the content on the board, and assign as many exercises as possible to deepen understanding.					
	Grade evaluation method : 4 regular exams (50%) and other exams, exercises, reports and effort of class(50%). etc, A re-examination may be conducted. The retest will be evaluated in the same way as the main test, with an upper limit of 80 points. Textbooks, notebooks, etc. are not allowed for the exam.					

Notice	<p>Precautions on enrollment : Students must take this class (no more than one-third of the required number of class hours missed) in order to complete the academic year.</p> <p>Course advice: This course teaches the basic ideas of probability and statistical methods required for engineering, so this course is of great importance.</p> <p>Foundational subjects : Fundamental Mathematics (1st year), Fundamental Linear Algebra (2nd), Differential and Integral I (2nd), Differential and Integral II (3rd), Differential Equations (3rd)</p> <p>Related subjects: Mathematics, physics, and other subjects after the third year</p> <p>Attendance advice : If you are late after, you may be treated as absent after a warning.</p>
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### Characteristics of Class / Division in Learning

<input type="checkbox"/> Active Learning	<input type="checkbox"/> Aided by ICT	<input type="checkbox"/> Applicable to Remote Class	<input type="checkbox"/> Instructor Professionally Experienced
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### E l e c t i v e s u b j e c t s

### Course Plan

			Theme	Goals
1st Semester	1st Quarter	1st	Guidance	
		2nd	n-dimensional space number vector space	Understanding the definition of n-dimensional space number vector space
		3rd	Dot product and Gram-Schmidt orthogonalization method	Understanding the definition of inner product and understanding Gram-Schmidt's orthogonalization method
		4th	Transformation of space by matrix Part 1	Understanding the deformation of space by a matrix Part 1
		5th	Transformation of space by matrix Part 2	Understanding the deformation of space by a matrix Part 2
		6th	Relationship between representation matrix and coordinates	Understanding the relationship between the representation matrix and coordinates
		7th	Dimension theorem	Understanding the dimensional theorem
		8th	Mid-term exam	Confirm basic matters
	2nd Quarter	9th	Jordan normal form part 1	Understanding Jordan Normal Form Part 1
		10th	Jordan normal form part 2	Understanding Jordan Normal Form Part 2
		11th	Jordan decomposition 1 part 1	Understanding of Jordan Decomposition 1 Part 1
		12th	Jordan decomposition 1 part 2	Understanding of Jordan Decomposition 1 Part 2
		13th	Complex numbers and quaternions	Understanding complex numbers and quaternions
		14th	Quaternion and rotation	Understanding quaternions and rotations
		15th	Last term exam	Confirm basic matters
		16th	Return of answer and explanation of answer	

### Evaluation Method and Weight (%)

	Examination	Presentation	Mutual Evaluations between students	Behavior	Portfolio	Other	Total
Subtotal	50	0	0	50	0	0	100
Basic Proficiency	50	0	0	50	0	0	100
Specialized Proficiency	0	0	0	0	0	0	0
Cross Area Proficiency	0	0	0	0	0	0	0

Tsuyama College		Year	2021		Course Title	Energy System Engineering
Course Information						
Course Code	0015		Course Category	Specialized / Elective		
Class Format	Lecture		Credits	Academic Credit: 2		
Department	Advanced Mechanical and Control System Engineering Course		Student Grade	Adv. 1st		
Term	Second Semester		Classes per Week	2		
Textbook and/or Teaching Materials	Textbooks: Distribution prints, heat transfer, Tetsuo Hirata et al. "Heat transfer engineering understood by examples" (Morikita Publishing), Reference books: Meng Saito "Basics of Industrial Thermodynamics" (Science), Tadanori Kojima et al. "Ace Fluid Dynamics" (Asakura Shoten) etc					
Instructor	HOSOTANI Kazunori, SAEKI Fumihiro					
Course Objectives						
Purpose of learning: To acquire basic knowledge about energy conversion and thermal energy, and to deepen understanding of mechanical design methods considering effective use of energy.						
Achievement goal: 1. You can deepen the expertise you have acquired in thermodynamics and fluid engineering. 2. You can deepen your knowledge of the theoretical cycle and understand the correspondence with the actual device. 3. 3. Understand the basic forms of heat transfer and explain the heat transfer mechanism in each form. 4. Understand and explain how to evaluate the performance of heat exchanges.						
Rubric						
	Ideal Level	Standard Level	Acceptable Level	Unacceptable Level		
Achievement 1	Understand and explain the specialized knowledge acquired in thermodynamics and fluid engineering, and deepen the application.	Understand and explain the expertise gained in thermodynamics and fluid engineering.	Recognizes the expertise gained in thermodynamics and fluid engineering.	It has not reached the left.		
Achievement 2	While deepening the knowledge of the theoretical cycle, you can understand and explain the correspondence with the actual device, and even apply it.	While deepening the knowledge of the theoretical cycle, understand and explain the correspondence with the actual device.	We are aware of the correspondence between the theoretical cycle and the actual device.	It has not reached the left.		
Achievement 3	The basic rules for the basic form of heat transfer can be applied to specific problems.	Understand the basic rules for the basic form of heat transfer and explain using mathematical formulas.	Explain the basic form of heat transfer in relation to familiar phenomena and engineering techniques.	It has not reached the left.		
Achievement 4	The heat exchanger performance evaluation method can be applied to specific problems.	Understand and explain how to evaluate the performance of heat exchangers.	Explain the structure and function of heat exchangers.	It has not reached the left.		
Assigned Department Objectives						
Teaching Method						
Outline	General / Specialty: Specialty / Energy and Flow					
	Learning Purpose: Acquire basic knowledge about energy conversion and thermal energy, and deepen understanding of mechanical design methods considering effective use of energy.					
	Mandatory / Choice:					
	Basic field of choice : Engineering / Mechanical Engineering / Thermal Engineering					
	Major Relationship with Learning Objectives: This subject is the subject's Learning Objectives "(2) Materials and Structure, Motion and Vibration, Energy and Flow" , Acquire knowledge of specialized fields of technology such as information and measurement / control, design and production / management, machines and systems, and acquire the ability to utilize them for design, policy, and operation of machines and systems. " is there.					
Style	Relationship with engineer education program: The main goals of learning / education in this subject are "(A) Deepening of basic knowledge about technology, A-2:" Materials and structure ", " Movement and vibration ", " Energy and To be able to acquire and explain the knowledge of specialized technical fields related to "flow", "information and measurement / control", "design and production / management", and "machines and systems". Concomitantly, it is also involved in "A-1".					
	Outline of class: Based on the thermodynamics and fluid engineering learned in this department, we will outline various cycles and heat conduction / heat transfer. We will explain the performance evaluation method of familiar cycles and the basics of mechanical design considering thermal energy transfer.					
	Class method: Classes will be conducted with board writing, projectors, and tabletop experiments while confirming expertise in thermodynamics and fluid engineering. Consider the application to actual problems and take care to deepen the understanding of basic theory through exercises.					
	Grade evaluation method: The grades of the two exams are evaluated equally (70%), and the total evaluation is made by adding exercises, assignments (reports), and learning outcomes outside class hours (30%). Guidance will explain how to bring textbooks (distributed prints), autograph notes, etc. to the exam.					

Notice	<p>Precautions for taking this course: This course is a "course that requires study outside of class hours".</p> <p>Course advice: Basic knowledge of thermodynamics and fluid engineering is a prerequisite.</p> <p>Foundation courses: Differential and Integral I (2nd year), Differential and Integral II (3rd), Mechanics III (3rd), Introduction to Thermodynamics (3rd), Thermodynamics (4th), Fluid engineering (4th), Heat transfer engineering (5th), Energy Conversion Engineering (5th), etc.</p> <p>related Subject: Mechanical / Control System Special Experiment (Adv. 1st year), Fluid mechanics (Adv. 2nd)</p> <p>Advice on attendance: Voluntary for exercises and given tasks to be conducted during class to deepen understanding of class Work positively. Late arrivals over 20 minutes are considered absent.</p>
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### Characteristics of Class / Division in Learning

<input type="checkbox"/> Active Learning	<input type="checkbox"/> Aided by ICT	<input checked="" type="checkbox"/> Applicable to Remote Class	<input checked="" type="checkbox"/> Instructor Professionally Experienced
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### E l e c t i v e s u b j e c t s

### Course Plan

			Theme	Goals
2nd Semester	3rd Quarter	1st	<ul style="list-style-type: none"> <li>Outline of the lecture [Guidance]</li> <li>Learning outside class hours: Imposing preparation and review of assignments.</li> </ul> Problem (1) [Basics of thermodynamics]	
		2nd	<ul style="list-style-type: none"> <li>Basics of thermodynamics (energy type of open system and closed system, heat pump)</li> <li>Learning outside class hours: Task (2) [Heat pump]</li> </ul>	Understand and explain the items on the left.
		3rd	<ul style="list-style-type: none"> <li>Air standard cycle (Carnot cycle, Brayton cycle, etc.)</li> <li>Learning outside class hours: Tasks (3) [Thermal efficiency of the cycle]</li> </ul>	Understand and explain the items on the left.
		4th	<ul style="list-style-type: none"> <li>Characteristics of steam (steam table, conversion state formula, etc.)</li> <li>Learning outside class hours: Exercise (4) [Steam state]</li> </ul>	Understand and explain the items on the left.
		5th	<ul style="list-style-type: none"> <li>Steam cycle ① (Basics of Rankine cycle)</li> <li>Learning outside class hours: Assignment (5) [Steam cycle]</li> </ul>	Understand and explain the items on the left.
		6th	<ul style="list-style-type: none"> <li>Steam cycle ② (composite cycle, multi-stage cycle)</li> <li>Learning outside class hours: Assignment (6) [composite cycle]</li> </ul>	Understand and explain the items on the left.
		7th	<ul style="list-style-type: none"> <li>Application of steam cycle</li> <li>Learning outside class hours: Task (7) [Application of heat pipe]</li> </ul>	Understand and explain the items on the left.
		8th	Mid-term exam	
	4th Quarter	9th	<ul style="list-style-type: none"> <li>Guidance</li> <li>Three modes of heat transfer (heat conduction, convective heat transfer, radiation heat transfer) · Fundamentals of heat conduction (the Fourier's law)</li> </ul>	Understand and explain the items on the left.
		10th	<ul style="list-style-type: none"> <li>Heat conduction problem (heat conduction equation, overall heat transfer)</li> <li>Learning outside class hours: Task (1) Heat conduction and overall heat transfer</li> </ul>	Understand and explain the items on the left.
		11th	<ul style="list-style-type: none"> <li>Convective heat transfer (heat transfer coefficient, heat transfer equation)</li> <li>Learning outside class hours: Task (2) Forced-convection heat transfer</li> </ul>	Understand and explain the items on the left.
		12th	<ul style="list-style-type: none"> <li>Heat exchanger 1 (heat-transfer rate, logarithmic mean temperature difference)</li> <li>Learning outside class hours: Task (3) Logarithmic mean temperature difference</li> </ul>	Understand and explain the items on the left.
		13th	<ul style="list-style-type: none"> <li>Heat exchanger 2 (temperature efficiency, number of heat transfer units)</li> <li>Learning outside class hours: Task (4) Temperature efficiency</li> </ul>	Understand and explain the items on the left.
		14th	<ul style="list-style-type: none"> <li>Condensation and boiling heat transfer</li> <li>Learning outside class hours: Task (5) Film condensation</li> </ul>	Understand and explain the items on the left.
		15th	<ul style="list-style-type: none"> <li>Radiation heat transfer (mechanism of radiation heat transfer, black/gray/real surfaces, view factors)</li> <li>Learning outside class hours: Task (6) Radiation exchange</li> </ul>	Understand and explain the items on the left.
		16th	Final exam	

### Evaluation Method and Weight (%)

	Examination	Presentation	Mutual Evaluations between students	Behavior	Report	Other	Total
Subtotal	70	0	0	0	30	0	100

Basic Proficiency	0	0	0	0	0	0	0
Specialized Proficiency	70	0	0	0	30	0	100
Cross Area Proficiency	0	0	0	0	0	0	0



Tsuyama College		Year	2021		Course Title	Advanced Design Engineering
Course Information						
Course Code	0016		Course Category	Specialized / Elective		
Class Format	Lecture		Credits	Academic Credit: 2		
Department	Advanced Mechanical and Control System Engineering Course		Student Grade	Adv. 1st		
Term	Second Semester		Classes per Week	2		
Textbook and/or Teaching Materials	Textbook: MAKABE "New Edition: Introduction to Reliability Engineering" (Japanese Standards Association) Reference Book: Omura "Story of Reliability Engineering" (Union of Japanese Scientists and Engineers) is easy to read.					
Instructor	KONISHI Daijiro					
Course Objectives						
Learning purposes : From the standpoint of ensuring product reliability at the design stage, the goal of this class is to reconsider the learned mechanical design in terms of reliability. By understanding the basic ideas and methods of machine design, including machine elements, you will acquire basic design skills related to various systems.						
Course Objectives : 1. Understand the basic concepts and methods of mechanical system design based on the mechanical engineering and electronic control engineering subjects studied in your department. 2. Machine and system design is directly linked to production activities around the world. Understand the significance of standardization and the importance of ISO and JIS standards. 3. Learn how many angles it is necessary to study in the design of an actual mechanical system, and acquire the basic ability to design specific issues. In addition, students will learn the comprehensive application capabilities of various disciplines and technologies through lectures on applied design engineering. ◎ It is possible to tackle issues by fusing various knowledge of specialized engineering and consider the impact of knowledge on society.						
Rubric						
	Excellent	Good	Acceptable	Unacceptable Level		
Achievement 1	Using the reliability evaluation method, it is possible to evaluate issues such as design requirements and problems and make logical decisions.	Explain the basic knowledge and theory for applying reliability engineering to your specialty.	You can generally say the basic knowledge and basic theory for applying reliability engineering to your specialty.	Can not say the basic knowledge and theory for applying reliability engineering to your specialty.		
Achievement 2	It is possible to study the design of mechanical systems in consideration of reliability and safety while operating ISO and JIS standards.	The reliability of the system can be calculated from the reliability of the parts that make up the system, and design studies can be conducted with consideration for reliability and safety.	The reliability of the system can be roughly calculated from the reliability of the parts that make up the system.	The reliability of the system cannot be calculated from the reliability of the parts that make up the system.		
Achievement 3	The limit model, durability model, and failure distribution model can be explained from the viewpoint of machine life, and can be analyzed using differentiation and integration.	Explain the reliability evaluation scale.	The reliability evaluation scale can be said in general.	The reliability evaluation scale can not be said.		
Achievement 4	Explain the basic items for designing a machine while considering the user, productivity, and environment.	Explain the role of reliability engineering.	The role of reliability engineering can be generally said.	The role of reliability engineering can not be said.		
Assigned Department Objectives						
Teaching Method						
Outline	General or Specialized : Specialized					
	Field of learning : Design and production / management					
	Foundational academic disciplines : Engineering / Mechanical engineering / Production Engineering / Processing Studies					
	Relationship with Educational Objectives : This class is equivalent to (2) Acquire knowledge in specialized technical fields such as materials and structure, motion and vibration, energy and flow, information and measurement / control, design and production / management, and machines and systems, and can be used for designing, manufacturing, and operating machines and systems.					
	Relationship with JABEE programs The main : The main goals of learning / education in this class is (A), A – 2 . We also learned about the importance of global standards and are incidentally related to "B-1".					
Course outline : Based on the mechanical engineering and electronic control engineering subjects studied in the department, we will learn what kind of process is used to design machines and systems that are active in modern society. Explain the basic concept of reliability design.						

Style	<p>Course method : Classes will be conducted using a projector. In addition, in order to deepen understanding, exercises will be imposed at appropriate times while considering the progress of the lesson.</p> <p>Grade evaluation method : The results of the two regular exams are evaluated equally (70%). For each examination, textbooks are not allowed. Students who score less than 60 points in each examination may have their scores changed if their understanding is confirmed through make-up exams and retests. However, the score after the change will not exceed 60 points. Evaluation is also based on exercises and reports (30%).</p>
Notice	<p>Precautions on the enrollment : Students must be completed (no more than 1/3 of the required numbers of class hours may be missed). This subject is a "subject that requires study outside of class hours". Classes are offered for 15 credit hours per credit, but 30 credit hours are required in addition to this. Follow the instructions of your instructor for these studies.</p> <p>Course advice : This subject is a subject that considers the development from the machine element design method that has been learned in the past to the design that regards the machine as a system. Therefore, as preparatory learning to be performed in advance, it is recommended to look back on the items learned so far while considering how the components of the machine affect the functions of the entire machine system. As background knowledge, knowledge about mechanical design, knowledge about subjects covering mechanical engineering and electronic control engineering in general, simple mathematical knowledge (understanding of algebras, and meanings and operations of symbols such as <math>n!</math>, <math>\exp</math>, <math>\ln</math>), probability Knowledge of the basics of theory and statistics (meaning of mean value, median, probability, independent event, normal distribution, etc.) is required.</p> <p>Foundational subjects : In addition to subjects covering mechanical engineering and electronic control engineering in general, knowledge of mechanical design , simple mathematics and statistics, etc.</p> <p>Related subjects : Energy System Engineering (Advanced Course 1st), Applied Creative Engineering (Advanced Course 1st), Strength and Fracture of Materials (Advanced Course 2nd), etc.</p> <p>Attendance advice : Basic knowledge of mechanical engineering and electronic control engineering is a prerequisite. It is important to think carefully about what manufacturing and production are. You can be late for up to 25 minutes, and if you exceed this, you will be considered absent.</p>

#### Characteristics of Class / Division in Learning

<input type="checkbox"/> Active Learning	<input type="checkbox"/> Aided by ICT	<input checked="" type="checkbox"/> Applicable to Remote Class	<input type="checkbox"/> Instructor Professionally Experienced
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#### E l e c t i v e s u b j e c t s

#### Course Plan

			Theme	Goals
2nd Semester	3rd Quarter	1st	<p>Guidance, Design and reliability 1 [Role and technology of reliability, quality management system]</p> <p>Learning contents outside class hours [Items] (Instructions): • Product liability and reliability as quality, ○ Functions and performance, QCD (for those who are not from mechanical systems)</p>	<p>Explain the significance of recognizing the concept of "reliability" and thinking about reliability for "systems". Understand the importance of reliability issues. Explain the basic concepts of marketing, "product out" and "market in". You can understand the relationship between quality assurance and reliability from the point of view of product quality assurance. It can be explained that quality is a "ruler" that represents the value of an item.</p>
		2nd	<p>Design and reliability 2. Introduction to reliability [Reliability engineering, reliability test data analysis]</p> <p>Learning content outside class hours [Items] (Instructions): • Same as above, organizing field data (histogram)</p>	<p>Explain the role of reliability engineering and the evaluation scales needed to consider maintaining and improving reliability. Understand that there are patterns in failure occurrence and explain the bathtub curve. Understand the concept of population and specimens. Understand the handling of reliability data.</p>
		3rd	<p>Failure model and strength / life design 1 [Strength function and model]</p> <p>Learning contents outside class hours [Items] (Instructions): • Failure as an object of reliability, relationship between strength design and reliability, random variable and probability distribution, ○ Load and strength, stress-based design, time-dependent fracture and Non-time-dependent fracture, safety factor, dynamic load coefficient</p>	<p>Explain the reference strength, the relationship between the allowable stress and the safety factor, and the concept and necessity of the safety factor. Understand the basic concepts and properties of random variables and probability distributions. Probability can be calculated for the normal distribution.</p>
		4th	<p>Failure model and strength / life design 2 [Progress process of metal fatigue]</p> <p>Learning contents outside class hours [Items] (Instructions): • Minor rule, Paris rule, ○ Fatigue fracture, elastic deformation and plastic deformation, crystal slip, fatigue strength, S-N curve, fatigue limit</p>	<p>Deepen your understanding of the fatigue properties of materials and calculate the fatigue life of structures from the miner's law (linear cumulative damage rule) and the Paris law (crack growth law). Understand the concepts of safe life design (safe life design) and fail-safe design (damage tolerance design).</p>
		5th	<p>Reliability scale [probability density function, distribution function, reliability function, instantaneous failure rate function]</p> <p>Learning content outside class hours [Items] (Instructions): • Relationship between probability and reliability / failure rate</p>	<p>Explain the structure of the machine tool body. Explain the principles and ideas necessary to realize high-precision machining. Understand the elemental technologies of machine tools / cutting tools technologies / machining technologies and consider measures for precision machining.</p>

		6th	Failure distribution model [probability distribution] Learning content outside class hours [Items] (Instructions): • Discrete probability distribution and continuous probability distribution	Understand the meaning of the binomial distribution, Poisson distribution, and exponential distribution (population probability distribution) in the probability distribution model. Understand that there are patterns in failure occurrence and explain the bathtub curve. The failure distribution model can be explained from the viewpoint of machine life. It can be explained that the four functions of probability density function: $f$ , cumulative distribution function: $F$ , reliability function: $R$ , and instantaneous failure rate function: $\lambda$ have a series of connections. That is, if one of the functions is known, the remaining three functions can be obtained.
		7th	Reliability test 1 [Data analysis of reliability test] Learning content outside class hours [Items] (Instructions): • Arrangement of field data (estimation and test)	Understand reliability testing and handling of reliability data. Given the information on the components of the system, each reliability rating scale can be calculated. The reliability characteristic value can be estimated from the data of the time until failure or the life, and the life phenomenon can be estimated from the failure distribution model. Understand the concept of estimation and can estimate by point estimation. Interval estimation and test of population mean can be performed.
		8th	1st semester mid-term exam	
	4th Quarter	9th	Return and commentary of exam answers. Distribution and prediction of reliability [system reliability model] Learning content outside class hours [Items] (Instructions): • System reliability model (parallel and series), exponential distribution	The reliability of series systems and parallel (redundant) systems can be calculated. The reliability of the system can be calculated from the reliability of the parts that make up the system.
		10th	Weibull plot [Weibull distribution] Learning content outside class hours [Items] (Instructions): • life prediction: Weibull plot for field data	The failure phenomenon and life can be estimated from the shape of the failure time distribution (failure distribution model). It can be analyzed using Weibull probability paper.
		11th	Reliability test 2 [Failure physics, reliability test] Learning content outside class hours [Items] (Instructions): • Accelerated test, random inspection	Understand the importance of reliability testing and reliability testing methods. Understand the procedure for performing Weibull analysis and Arrhenius plot for life prediction by temperature acceleration.
		12th	Maintainability and reliability design [Availability, reliability design] Learning content outside class hours [Items] (Instructions): • Error recovery, maintenance and availability, ergonomics	The reliability of the repair system can be calculated. Explain the meaning of availability and calculate the availability of repair systems. It can be explained that maintainability is indispensable for maintaining the reliability of the product and exerting the function of the product. The product to be designed can be designed while considering the user and the environment.
		13th	Machine safety and margin design [Safety factor and failure probability] Learning content outside class hours [Items] (Instructions): • Stress / strength distribution model and stress based design	Understand the outline of safety technology, which is the interface with reliability. It is possible to design a mechanical system with consideration for safety.
		14th	Reliability analysis method [Failure analysis] Learning content outside class hours [Items] (Instructions) • Risk and failure analysis	FMEA and FTA methods can be used as trouble prevention methods. Risk management techniques can be used to predict and respond to failures. By using a reliability evaluation method that solves real problems in a real way, problems such as design specifications and problems can be clarified, and logical judgments can be made for the problems.
		15th	(1st semester final exam)	
		16th	Return and commentary of exam answers.	

#### Evaluation Method and Weight (%)

	Examination	Presentation	Mutual Evaluations between students	Behavior	Portfolio	Work / report	Total
Subtotal	70	0	0	0	0	30	100
Basic Proficiency	0	0	0	0	0	0	0
Specialized Proficiency	70	0	0	0	0	30	100
Cross Area Proficiency	0	0	0	0	0	0	0

Tsuyama College		Year	2021		Course Title	Applied Creative Engineering	
Course Information							
Course Code	0017		Course Category	Specialized / Elective			
Class Format	Lecture		Credits	Academic Credit: 2			
Department	Advanced Mechanical and Control System Engineering Course		Student Grade	Adv. 1st			
Term	First Semester		Classes per Week	2			
Textbook and/or Teaching Materials	Textbooks: Koichi TAGUCHI, Goji AKASHI "Precision Machining (Mechanical Textbook Series 16)" (Corona Publishing) Reference: Toyoji ITO "Essence of Ultra-Precision Machining" (Nikkan Kogyo Shimbun) explains from the perspective of know-how at production sites. "Principles of Production Processing" edited by the Japan Society of Mechanical Engineers (Nikkan Kogyo Shimbun) explains overall production processing from a comprehensive and principle perspective. For beginners to learn about machine manufacturing in general, Hiromichi ONIKURA "Introduction to Machine Manufacturing" (Yokendo) is easy to read.						
Instructor	KONISHI Daijiro						
Course Objectives							
Learning purposes : To deepen the basic knowledge about ultra-precision machining by thinking about machine tools, cutting tools, machining processes and their technologies for high-precision machining.							
Course Objectives : 1. Consider the fields of application of precision machining and ultra-precision machining and their social implications. 2. Understand the definition of ultra-precision machining and knowledge about precision machining, and consider measures for high-precision machining. 3. Reconfirm basic knowledge about machining and machine tools. 4. Understand the element design technology of machine tools and tool technology for ultra-precision machining. 5. Understand the metal cutting mechanism. 6. Understand the characteristics of cutting / grinding / polishing and understand the challenges for ultra-precision machining. 7. Understand the machining process of composite machining and gain knowledge about application examples to ultra-precision machining.							
Rubric							
	Excellent		Good		Acceptable		Unacceptable Level
Achievement 1	Describe the fields of application of precision machining and ultra-precision machining and their social implications.		Explain the fields of application of precision machining and ultra-precision machining and their added value.		The fields of application of precision machining and ultra-precision machining and their added value can be generally said.		Can not say the fields of application of precision machining and ultra-precision machining.
Achievement 2	Understand the definition of ultra-precision machining and knowledge about precision machining, and be able to evaluate and consider guidelines for precision machining.		Be able to understand and classify the difference between normal machining / ultra-precision machining / micromachining from the relationship between the machining unit and the size of the tool.		From the relationship between the machining unit and the size of the tool, the difference between normal machining / ultra-precision machining / micromachining can be roughly said.		From the relationship between the machining unit and the size of the tool, the difference between normal machining / ultra-precision machining / micromachining can not be said.
Achievement 3	Explain the characteristics of various machining methods by classifying them from the viewpoint of changes in the mass of the workpiece. Explain that the machine tools are designed based on displacement. Explain the relationship between machine tools, cutting tools, and workpieces.		Explain the characteristics of various machining methods by classifying them from the viewpoint of changes in the mass of the workpiece. Explain that the machine tools are designed based on displacement.		Explain the characteristics of various machining methods by classifying them from the viewpoint of changes in the mass of the workpiece.		Can not explain the characteristics of various machining methods by classifying them from the viewpoint of changes in the mass of the workpiece.
Achievement 4	Explain the element design technology of machine tools and cutting tool technology, phenomena and models of removal process, and evaluate and consider measures for precision machining.		Explain the element design technology of machine tools and cutting tool technology, phenomena and models of removal process.		Can be said the element design technology of machine tools and cutting tool technology, phenomena and models of removal process.		Can not be said the element design technology of machine tools and cutting tool technology, phenomena and models of removal process.
Achievement 5	Understand the characteristics of cutting / grinding / polishing from the processing principle, and evaluate and explain methods and issues for ultra-precision processing.		Explain the characteristics of cutting / grinding / polishing from the processing principle.		From the processing principle, the characteristics of cutting / grinding / polishing can be generally said.		From the processing principle, the characteristics of cutting / grinding / polishing can not be said.

Achievement 6	Understand the machining process of cutting / grinding / polishing, explain application examples to ultra-precision machining, and evaluate and consider issues of ultra-precision machining technology.	Understand the machining process of cutting / grinding / polishing, explain application examples to ultra-precision machining.	Understand the machining process of cutting / grinding / polishing, and can generally say about application examples to ultra-precision machining.	Can not understand the machining process of cutting / grinding / polishing, and can not say about application examples to ultra-precision machining.
Achievement 7	Understand the machining process of composite machining and explain the knowledge about application examples of ultra-precision machining.	Understand the machining process of composite machining and explain application examples of ultra-precision machining.	Explain the application example of composite machining to ultra-precision machining.	Can not explain the application example of composite machining to ultra-precision machining.

#### Assigned Department Objectives

#### Teaching Method

Outline	<p>General or Specialized : Specialized</p> <p>Field of learning : Design and production / management</p> <p>Foundational academic disciplines : Engineering / Mechanical engineering / Production Engineering / Processing Studies</p> <p>Relationship with Educational Objectives : This class is equivalent to (2) Acquire knowledge in specialized technical fields such as materials and structure, motion and vibration, energy and flow, information and measurement / control, design and production / management, and machines and systems, and can be used for designing, manufacturing, and operating machines and systems.</p> <p>Relationship with JABEE programs The main : The main goals of learning / education in this class is (A), A – 2 .</p> <p>Course outline : Precision and ultra-precision machining technologies play an important role in modern science and technology, and are evolving and developing complementarily with other peripheral technologies. In this lecture, we will give an overview of the features and mechanisms of precision and ultra-precision machining technologies, mainly for cutting and abrasive machining, and learn about their roles in advanced technologies.</p>
Style	<p>Course method : Classes will be conducted using a projector. We will proceed with the lessons while confirming the knowledge about machining and machine tools that we have acquired so far. In addition, in order to deepen understanding, exercises will be imposed at appropriate times while considering the progress of the lesson.</p> <p>Grade evaluation method : The results of the two regular exams are evaluated equally (70%). For each examination, textbooks are allowed. Students who score less than 60 points in each examination may have their scores changed if their understanding is confirmed through make-up exams and retests. However, the score after the change will not exceed 60 points. Evaluation is also based on exercises and reports (30%).</p>
Notice	<p>Precautions on the enrollment : Students must be completed (no more than 1/3 of the required numbers of class hours may be missed). This subject is a "subject that requires study outside of class hours". Classes are offered for 15 credit hours per credit, but 30 credit hours are required in addition to this. Follow the instructions of your instructor for these studies.</p> <p>Course advice : This is a subject that requires knowledge of machining and machine tools that have been learned so far. Therefore, as a preparatory study to be conducted in advance, it is recommended to look back on the knowledge about machining and machine tools learned in your department. Students from other than Mechanical Systems are required to review mechanics and self-learn what students graduated from Mechanical Systems have learned in Manufacturing Technology, Mechanical Design, and Strength of Materials.</p> <p>Foundational subjects : Design of Mechanical Elements I, II (Mechanical 3rd, 4th year), Manufacturing Technology (Mechanical 2nd), Instrumentation Engineering (Mechanical 4th), Material Processing (Mechanical 5th), etc.</p> <p>Related subjects : Experiments of Mechanical and Control Systems (Advanced Course 1st), Advanced Design Engineering (Advanced Course 1st), etc.</p> <p>Attendance advice : Based on the knowledge learned in this department, comprehensively consider the knowledge of element technology in machine tools, cutting tool technology, machining technology, control / measurement technology for improving machining accuracy. You can be late for up to 25 minutes, and if you exceed this, you will be considered absent.</p>

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#### Elective subjects

#### Course Plan

		Theme	Goals
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1st Semester	1st Quarter	1st	Guidance, Products to which the ultra-precision machining method is applied  Learning contents outside class hours [Items] (Instructions): ○ Precision and accuracy, three elements of accuracy, functional compatibility, dimensional tolerance and fits, geometrical tolerance, surface texture (for those who are not from Mechanical Systems)	Describe the fields of application of ultra-precision machining and micromachining and their social implications.
		2nd	Background of ultra-precision machining 1 [What is ultra-precision machining?]  Learning contents outside class hours [Items] (Instructions): ・ Technical trends of machine tools from the viewpoint of function / machining accuracy (for all students), ○ Outline of removal process, shape of workpiece and tool motion relationships, cutting mechanisms and processes, machinability, cutting tools and machine tools	Understand how to cut machine materials and the basics of machine tools.
		3rd	Background of ultra-precision machining 2 [Types of ultra-precision machining]  Learning contents outside class hours [Items] (Instructions): ・ Ultra-precision machining technology from the viewpoint of transferability and resolution of machining, ○ Machining principle, abrasive machining, fixed abrasive machining and free abrasive machining, self-sharpening, grinding, grinding wheel / grinding fluid	Explain the characteristics of various machining methods by viewing and classifying them from the viewpoint of changes in the mass of the workpiece. Explain the characteristics of cutting / grinding / polishing from the viewpoint of transferability and resolution. Understand and classify the difference between normal machining / ultra-precision machining / micromachining.
		4th	Background of ultra-precision machining 3 [Basic technology of ultra-precision machining system]  Learning contents outside class hours [Items] (Instructions): ・ Reproducibility and basic technology of ultra-precision machining machine, ○ Hooke's law, rigidity, residual stress, coefficient of thermal expansion of cast iron / steel (linear expansion coefficient), self-excited vibration, vibration isolation and vibration control, numerical control (NC), feedback	Understand the elemental technologies of machine tools / cutting tools technologies / machining technologies and consider measures for precision machining.
		5th	Ultra-precision machine tools 1 [Structure of machine tools, roles of components, structural elements]  Learning contents outside class hours [Items] (Instructions): ・ Basic components of machine tools and shape-creating motion, ・ Relationship between mechanical properties and rigidity of structural materials, ○ Line of force, flexural rigidity, torsional rigidity, equation of motion of 1 degree of freedom lumped constant system model, material characteristic value and structural material	Explain the structure of the machine tool body. Explain the principles and ideas necessary to realize high-precision machining. Understand the elemental technologies of machine tools / cutting tools technologies / machining technologies and consider measures for precision machining.
		6th	Ultra-precision machine tools 2 [Machine tool components and technical ingenuity-spindle]  Learning contents outside class hours [Items] (Instructions): ・ Rigidity of spindle (bearing structure) and rotation accuracy, rigidity of guidway and motion accuracy, technical ingenuity for speedup, ○ Rolling bearing / hydrodynamic bearing (dynamic pressure) / hydrostatic bearing (static pressure), Newton's law of viscosity, pressure flow and shear flow, equation of continuity	Explain the structure of machine tools and the drive system of the spindle. Explain the principles and ideas necessary to realize precision machining. Understand the elemental technologies of machine tools / cutting tools technologies / machining technologies and consider measures for precision machining. Explain the principle of fluid lubrication of plain bearings and journal bearings. Explain the difference between hydrostatic bearings and dynamic pressure bearings and the principle of hydrostatic bearings.
		7th	Ultra-precision machine tools 3 [Machine tool components and technical ingenuity-linear motion mechanism]  Learning contents outside class hours [Items] (Instructions): ・ Rigidity and motion accuracy of linear motion mechanism ・ technical ingenuity for speedup, ○ Servo system elements: servomotor, coupling, ball screw / nut, encoder, linear scale	Explain the structure of machine tools and the drive system for guidway. Explain the principles and ideas necessary to realize precision machining. Understand the elemental technologies of machine tools / cutting tools technologies / machining technologies and consider measures for precision machining.
		8th	1st semester mid-term exam	
	2nd Quarter	9th	Return and commentary of exam answers. Tools for ultra-precision cutting [ultra-precision cutting tools and tool holders]  Learning contents outside class hours [Items] (Instructions): ・ Items required for cutting tools, ○ Chuck, machine vise, collet chuck, single point tool, ceramics / cemented carbide / high-speed tool steel, hardness / toughness, wear	Understand the elemental technologies of machine tools / cutting tools technologies / machining technologies and consider measures for precision machining. Acquire basic knowledge about machine tools / cutting tools / machining processes, and be able to consider ultra-precision machining techniques and issues. Explain the properties that cutting tools should have and the conditions and types of cutting tool materials. Explain the phenomenon caused by the wear of the cutting tool edge and the cutting tool life.

		10th	<p>Metal cutting mechanism 1 [Cutting model and chips]</p> <p>Learning contents outside class hours [Items] (Instructions): ・ Phenomenon of cutting, ○ Decomposition and composition of force, equilibrium of forces / moments, ductile fracture and brittle fracture, stress and strain, normal stress and shear stress, elasticity and plasticity, work hardening</p>	<p>Explain the mechanism of cutting, the form of chips, the generation of heat due to cutting, and the build up edge. After understanding the phenomenon of removal processing, the model can be explained.</p>
		11th	<p>Metal cutting mechanism 2 [Cutting resistance and machining with a single shear plane model]</p> <p>Learning contents outside class hours [Items] (Instructions): ・ Cutting resistance and single shear plane model, ○ Friction angle, material defects (point defects, line defects (dislocations), surface defects (grain boundaries)), crystal slip (yield)</p>	<p>Acquire basic knowledge about machine tools / cutting tools / machining processes, and be able to consider ultra-precision machining techniques and issues. Explain the mechanism of cutting, the form of chips, the generation of heat due to cutting, and the build up edge. After understanding the phenomenological theory of removal processing, the model can be explained.</p>
		12th	<p>Metal cutting mechanism 3 [Roughness of finished surface, method of obtaining high quality finished surface roughness by cutting and ultra-precision cutting mechanism] ・ Abrasive machining [Model for grinding, problems of grinding, conventional grinding and Its features]</p> <p>Learning contents outside class hours [Items] (Instructions): ・ Relationship between cutting conditions / tool conditions and surface roughness, ○ Real contact, adhesion, heat treatment (annealing, recovery and recrystallization), austenite, ○ Probability density function, (cumulative) distribution function, upward / downward cutting</p>	<p>It is possible to describe the precision cutting technology and its social implications. Explain how to devise cutting tools to improve machining accuracy and productivity.</p>
		13th	<p>Ultra-precision grinding [ultra-precision grinding]</p> <p>Learning content outside class hours [Items] (Instructions): ・ Characteristics of abrasive machining and technical ingenuity for higher accuracy</p>	<p>Explain the 3 elements and 5 factors of the grind wheel, and explain how to select the grind wheel from the relationship between these and the grinding performance. Explain the similarities and differences between grinding and polishing. Abrasive machining can be classified into machining using fixed abrasive grain tools and free abrasive grain tools. Explain the mechanism and features of grinding It is possible to describe the high precision grinding technology and its social implications.</p>
		14th	<p>Ultra-precision polishing [conventional polishing method and ultra-precision polishing]</p> <p>Learning contents outside class hours [Items] (Instructions): ・ Characteristics of processing with fixed and free abrasive grains, ・ Processing mechanism for super smooth surface creation</p>	<p>Polishing can be classified according to how the abrasive grains are fixed. It is possible to describe the high-precision polishing technology and its social implications.</p>
		15th	(1st semester final exam)	
		16th	Return and commentary of exam answers.	

#### Evaluation Method and Weight (%)

	Examination	Presentation	Mutual Evaluations between students	Behavior	Portfolio	Work / report	Total
Subtotal	70	0	0	0	0	30	100
Basic Proficiency	0	0	0	0	0	0	0
Specialized Proficiency	70	0	0	0	0	30	100
Cross Area Proficiency	0	0	0	0	0	0	0

Tsuyama College		Year	2021	Course Title	Advanced Control Apparatus
Course Information					
Course Code	0018		Course Category	Specialized / Elective	
Class Format	Seminar		Credits	Academic Credit: 2	
Department	Advanced Mechanical and Control System Engineering Course		Student Grade	Adv. 1st	
Term	First Semester		Classes per Week	2	
Textbook and/or Teaching Materials	Distribute materials as needed				
Instructor	INOUE Hiroyuki				
Course Objectives					
<p>Learning purposes :</p> <p>To understand the characteristics and control methods of pneumatic actuators, three-phase induction motors, DC servomotors, PLCs and microcontrollers for the factory automation.</p> <p>Course Objectives :</p> <ol style="list-style-type: none"> <li>1. To understand the basic structure of a pneumatic circuit.</li> <li>2. To understand the control circuit of a pneumatic actuator.</li> <li>3. To explain the structure and characteristics of DC servo motors.</li> <li>4. To understand PLCs and ladder diagrams.</li> <li>5. To explain the basics of microcomputer functions and configurations.</li> </ol>					
Rubric					
	Excellent	Good	Acceptable	Not acceptable	
Achievement 1	To be able to draw pneumatic circuit configuration and sequence diagram by oneself.	To understand pneumatic circuits and sequence diagrams.	To explain the operation of pneumatic actuators.	Not reached the left.	
Achievement 2	To draw the control circuit and sequence diagram of the pneumatic actuator by yourself.	To understand the applications of pneumatic actuators.	To understand the control method of pneumatic actuators.	Not reached the left.	
Achievement 3	To derive mathematical models of DC servo motors.	To explain the basic characteristics of DC servo motors.	To understand the structure of a DC servo motor.	Not reached the left.	
Achievement 4	To draw PLC wiring diagrams and ladder diagrams for a simple real system	To understand PLC wiring diagrams and ladder diagrams.	To understand the ladder diagram.	Not reached the left.	
Achievement 5	To explain the impact of microcomputers on industrial technology.	To explain the functions and configuration of a microcomputer.	To explain the functions of a microcomputer.	Not reached the left.	
Assigned Department Objectives					
Teaching Method					
Outline	<p>General or Specialized : Specialized</p> <p>Field of learning : Energy / Measurement and Control</p> <p>Foundational academic disciplines : Engineering / Mechanical Engineering / Mechanical Mechanics / Control</p> <p>Relationship with Educational Objectives : This class is equivalent to "(3) Acquire deep foundation knowledge of the major subject area".</p> <p>Relationship with JABEE programs : The main goals of learning / education in this class are "(A) , A-2.</p> <p>Course outline :</p> <p>In the robot control, to learn about the stabilization of control systems and the improvement of response based on modern control theory. To learn controllability and observability based on the state equation. To learn the discrimination law of stability or instability.</p>				
Style	<p>Course method :</p> <p>Modern control theory is based on matrix operations, linear algebra is reviewed first, and then control methods based on the state equation of dynamic systems are explained in detail.</p> <p>Grade evaluation method : Exams (70%) + portfolio (30%).</p> <p>A grade of less than 60 points may be required to retake the exam, and the average of the regular exam and the re-exam will be re-calculated for the exam, and if the grade exceeds 60 points, the student will receive a score of 60 points.</p>				
Notice	<p>Precautions on the enrollment : This is a "class that requires study outside of class hours". Classes are offered for 15 hours per credit, but 30 credit hours are required in addition to this. Follow the instructions of your instructor for these studies.</p> <p>Course advice : Modern control theory uses matrix calculation, so it should be reviewed thoroughly.</p> <p>Foundational subjects : Control Engineering (4th year), Robot Control (5th year)</p> <p>Attendance advice :In many cases, control devices are used in the production of experimental equipment or in hobbies, so it is recommended that students have the opportunity to come into contact with actual devices as much as possible through such work.</p>				
Characteristics of Class / Division in Learning					
<input type="checkbox"/> Active Learning		<input type="checkbox"/> Aided by ICT		<input checked="" type="checkbox"/> Applicable to Remote Class	
				<input type="checkbox"/> Instructor Professionally Experienced	



Elective subjects							
Course Plan							
			Theme	Goals			
1st Semester	1st Quarter	1st	Guidance	Understand the concept of pneumatic circuits.			
		2nd	Pneumatic technology for automation	Understand the concept of pneumatic circuits.			
		3rd	Pneumatic technology for automation	Explain air cylinders and speed controllers.			
		4th	Pneumatic technology for automation	Understand control method an air cylinder.			
		5th	Pneumatic technology for automation	Explain directional control valves.			
		6th	Pneumatic technology for automation	Explain power transmission and distribution systems.			
		7th	AC and three-phase induction motors	Explain induction motors.			
		8th	DC servo motor	Explain DC servo motor			
	2nd Quarter	9th	Stepping motor	Explain stepping motor			
		10th	Various sensors	Explain capacitive proximity sensors and photoelectric sensors.			
		11th	Switches, relays	Explain Switches and relays.			
		12th	Sequence control	Understand the concept of sequence control.			
		13th	PLC	Explain PLC			
		14th	Microcomputer for control	Explain Arduino and Raspberry Pi.			
		15th	(1st semester final exam)				
		16th	Return and commentary of exam answers				
Evaluation Method and Weight (%)							
	Examination	Presentation	Mutual Evaluations between students	Behavior	Portfolio	Other	Total
Subtotal	70	0	0	0	30	0	100
Basic Proficiency	0	0	0	0	0	0	0
Specialized Proficiency	70	0	0	0	30	0	100
Cross Area Proficiency	0	0	0	0	0	0	0

Tsuyama College		Year	2021		Course Title	Environmental Science Theory
Course Information						
Course Code	0019		Course Category	Specialized / Elective		
Class Format	Lecture		Credits	Academic Credit: 2		
Department	Advanced Mechanical and Control System Engineering Course		Student Grade	Adv. 1st		
Term	Second Semester		Classes per Week	2		
Textbook and/or Teaching Materials	Textbook: Barron's "Environmental Science, 8th edition", print materials will be distributed during class. Reference book: Kikuo Miyokawa "Basics of Environmental Science Revised Edition" (Baifukan)					
Instructor	KOBAYASHI Toshiro					
Course Objectives						
Learning purposes : The goal is to Understand the current situation and countermeasures for global environmental problems. In addition, through exercises and reports, students will develop the ability to comprehensively apply various academic fields and techniques, the ability to set problems through compound-eye thinking, and the ability to recognize problems from the perspectives of public health and safety, ethics, and so on.						
Course Objectives : 1. Understand and explain the Earth's energy resources (fossil fuels, nuclear energies, renewable energies, etc.) 2. Understand and explain global environmental problems (air pollution, acid rain, global warming, etc.) 3. Understand and explain environmental management (ecosystem destruction) 4. Can calculate CO2 emissions, which is an indicator of environmental problems						
Rubric						
	Excellent		Good		Acceptable	Not acceptable
Achievement 1	• Understand the energy resources of the earth and compare and explain their merits and demerits (fossil fuels, nuclear energy, renewable energy, etc.)		• Understand and explain the energy resources of the earth (fossil fuels, nuclear energy, renewable energy, etc.)		• Understand and explain the basics of the earth's energy resources (fossil fuels, nuclear energy, renewable energy, etc.)	• Cannot explain the energy resources of the earth (fossil fuels, nuclear energy, renewable energy, etc.)
Achievement 2	• Understand global environmental problems and discuss how to deal with them (air pollution, acid rain, global warming, etc.)		• Understand and explain global environmental problems (air pollution, acid rain, global warming, etc.)		• Understand and explain basic global environmental problems (air pollution, acid rain, global warming, etc.)	• Cannot explain global environmental problems (air pollution, acid rain, global warming, etc.)
Achievement 3	• Understand environmental management and discuss issues (ecosystem destruction)		• Understand and explain environmental management (ecosystem destruction)		• Understand and explain basic environmental management (ecosystem destruction)	• Cannot explain about environmental management (ecosystem destruction)
Achievement 4	• It is possible to calculate and consider CO2 emissions, which are indicators of environmental problems.		• Can calculate CO2 emissions, which is an indicator of environmental problems		• Know the basic calculation method of CO2 emissions, which is an indicator of environmental problems.	• Don't know how to calculate CO2 emissions, which is an indicator of environmental problems.
Assigned Department Objectives						
Teaching Method						
Outline	* Relationship with work experience: This subject is taught by a teacher who has experience in research and development of clean energy-related equipment such as fuel cells, hydrogen production equipment, and solar cell production equipment, and atomic energy-related equipment such as sensors for fast breeder reactors and vacuum pumps for fusion equipment.					
Style	General or Specialized : Specialized  Foundational academic disciplines : Science and Engineering / Engineering / Comprehensive Engineering / Earth / Resource System Engineering  Relationship with Educational Objectives in advanced course: This subject is equivalent to a learning goal of the advanced course , which is "(1) To deepen knowledge of natural science subjects centered on mathematics and physics, and to acquire the ability to apply as basic academic ability related to mechanical / control system engineering and electronic / information system engineering."  Relationship with JABEE programs : The main goal of this subject is to "(A) deepen basic knowledge about technology and to be able to acquire and explain knowledge in a wide range of fields of natural science as basic knowledge about A-1 engineering". Concomitantly, it is also involved in "B-1" and "G-1".  Course outline : Deterioration of the global environment represented by global warming and ozone layer depletion is thought to be progressing along with the activation of human economic activities, and foreign literature is also used to discuss the actual conditions of these global environmental problems. learn. Next, we will deepen our understanding of the efforts of the United Nations, governments and space agencies of each country, and specific environmental conservation measures.					

Notice	<p>Course method : Classes will be conducted using handout prints, projectors and board writing. Foreign literature is also used as a teaching material in class. In addition, questions will be asked at any time to confirm the level of understanding of the students. Furthermore, by having them practice, they will improve their understanding, and by imposing reports, they will develop their awareness of environmental issues as engineers.</p> <p>Grade evaluation method : Be sure to submit the report assignment by the specified date. Test (70%) "In principle, it is once, but depending on the situation, a retest may be performed. The retest is evaluated in the same way as this test." Report assignments and exercises will be assigned 30%. In addition to self-written notebooks, handouts, calculators, and printouts of the manuscripts used in the lectures, you can bring them into the exam.</p> <p>Precautions on the enrollment : This is a class that requires study outside of class hours. A total of 45 hours of study is required per credit, including both class time and study outside class time. Follow the instructions of the instructor regarding study outside of class hours.</p> <p>Course advice : As preparatory study to be conducted in advance, it is desirable to be interested in the latest information, data, and current affairs news about the environment, and to browse it as needed to broaden your own knowledge. In addition, since some lectures will be given in English using English textbooks, it is desirable to actively come into contact with English on a daily basis.</p> <p>Foundational subjects : Environmental science (5th year)</p> <p>Related subjects: Mathematical Science II (5th year), Life Science II (5th), Science Inquiry (2nd in advanced course)</p> <p>Attendance advice : "This subject is related to environmental education and nuclear core human resource development. " Information on the environment is published on various websites, including the websites of the United Nations and the Ministry of the Environment, so it is advisable to browse them as needed to broaden your knowledge. If you are not seated at the beginning of the class, you will be late.</p>

#### Characteristics of Class / Division in Learning

<input checked="" type="checkbox"/> Active Learning	<input type="checkbox"/> Aided by ICT	<input checked="" type="checkbox"/> Applicable to Remote Class	<input type="checkbox"/> Instructor Professionally Experienced
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#### E l e c t i v e s u b j e c t s

#### Course Plan

			Theme	Goals
2nd Semester	3rd Quarter	1st	● Guidance, outline of global environmental problems, formation of global environment	Explain the origin of the global environment.
		2nd	● Resources I [Energy and environment]	Explain the relationship between fossil fuels and the environment.
		3rd	● Resources II [Fossil fuels and environment]	Explain the relationship between fossil fuels and the environment.
		4th	● Resources III [Nuclear Energy and Environment]	Explain the relationship between nuclear energy and the environment.
		5th	● Resources IV [Renewable energy]	Report assignment (1) "Current status and issues of environmental and energy problems" (select different survey items for each person) Explain renewable energy.
		6th	● Basics of earth science	Explain the basics of earth science.
		7th	● Environmental Management I [Air Pollution]	Explain the mechanism and countermeasures of air pollution.
		8th	● Environmental management II [acid rain]	Explain the mechanism and countermeasures of acid rain
	4th Quarter	9th	● Environmental Management III [Global Warming ① / Greenhouse Gas]	Report subject (2) "Investigation and examination of energy consumption and CO2 emissions at home" Explain greenhouse gases.
		10th	● Environmental Management IV [Global Warming ② / Forecasting and Countermeasures]	Explain the mechanism and prediction method of global warming
		11th	● Environmental management V [Destroy ecosystem]	Explain the destruction of ecosystems.
		12th	● Environmental Management VI [Aquatic Pollution]	Explain the pollution and circulation of the hydrosphere.
		13th	● Future energy selection discussion (students with similar values)	Explain your views on environmentally friendly energy choices.
		14th	● Future energy selection discussion (different values) Students)	Be able to logically explain own views on environmentally friendly energy choices.
		15th	(Final exam)	Attend and submit your answer.
		16th	Returning the final exam answer and explaining the answer	Correct the wrong answer question.

#### Evaluation Method and Weight (%)

	Examination	Presentation	Mutual Evaluations between students	Behavior	Portfolio	Other	Total
Subtotal	70	0	0	0	30	0	100

Basic Proficiency	0	0	0	0	0	0	0
Specialized Proficiency	70	0	0	0	30	0	100
Cross Area Proficiency	0	0	0	0	0	0	0

Tsuyama College		Year	2021		Course Title	Engineering Ethics
Course Information						
Course Code	0020		Course Category	Specialized / Elective		
Class Format	Lecture		Credits	Academic Credit: 2		
Department	Advanced Mechanical and Control System Engineering Course		Student Grade	Adv. 1st		
Term	First Semester		Classes per Week	2		
Textbook and/or Teaching Materials	Textbook: Hayashi, Miyazawa et al. "Ethics of Engineers (Revised Edition)" Corona Publishing Co., Ltd., Reference Book: Hisatake Kato "Ethics of Technology and Humans" NHK Library, etc.					
Instructor	HOSOTANI Kazunori,MIYASHITA Takuya					
Course Objectives						
Purpose of study: Understand the necessity of engineering ethics and engineer ethics, and acquire a basic sense of responsibility for future activities as an engineer.						
Achievement goal: <ul style="list-style-type: none"><li>• Recognize the responsibility and originality that engineers have on society, and be able to give consideration so that the results of technology will be accepted by society.</li><li>• Understand the historical and social background and importance of engineer ethics, and explain the role and responsibility of engineers in society.</li><li>• Understand and explain basic matters related to engineer behavior such as accountability, whistleblowers, product liability, and risk management.</li><li>• Through the examination of issues by the group, it is possible to promote collaborative work with a sense of ownership.</li></ul>						
Rubric						
	Ideal Level	Standard Level	Acceptable Level	Acceptable Level		
Achievement 1	It is possible to understand and explain that engineers are aware of the responsibilities and creativity that society has, and to give consideration so that the results of technology will be accepted by society, and even apply it.	Be able to understand and explain that engineers recognize the responsibilities and creativity that society has, and take care to ensure that the results of technology are accepted by society.	It is possible to recognize the responsibility and originality that engineers have on society, and to recognize the importance of giving consideration to the acceptance of technological results by society.	It has not reached the left.		
Achievement 2	Understand the historical and social background and importance of engineer ethics, understand and explain the roles and responsibilities of engineers in society, and even apply them.	Understand the historical and social background and importance of engineer ethics, and understand and explain the roles and responsibilities of engineers in society.	Understand the historical and social background and importance of engineer ethics, and recognize the importance of the role and responsibility of engineers in society.	It has not reached the left.		
Achievement 3	Can understand and explain basic matters related to engineer behavior such as accountability, whistleblowing, product liability, and risk management, and can even apply them.	Understand and explain basic matters related to engineer behavior such as accountability, whistleblowers, product liability, and risk management.	Recognize the importance of basic matters related to engineer behavior such as accountability, whistleblowers, product liability, and risk management.	It has not reached the left.		
Achievement 4	Through the examination of issues by the group, it is possible to promote collaborative work with a sense of ownership, to lead the members as a coordinator of discussions, and to actively present their own opinions.	Through the examination of issues by the group, it is possible to promote collaborative work with a sense of ownership, actively participate in discussions, and speak multiple times.	Through the examination of issues by the group, it is possible to promote collaborative work with a sense of ownership and to participate in discussions.	It has not reached the left.		
Assigned Department Objectives						
Teaching Method						

Outline	<p>* Relationship with business: In this course, faculty members who were engaged in the management and operation of large-scale computers and networks at other institutions will make use of their experience to teach about engineer ethics issues in the information society. In addition, faculty members who were engaged in design / development at an electronics manufacturer and information programming at an environmental research company will use their experience to give lessons on engineer ethics issues that can occur in the real world.</p> <p>By general / specialty: Specialty, natural science basics / common</p> <p>Basic discipline of choice : Engineering ethics / engineer ethics</p> <p>Major related to learning goals: This subject is the major learning goals "(( 5) Along with studying engineering ethics and taking special lectures on engineer ethics, you can broadly understand engineer ethics. "</p> <p>Relationship with Engineer Education Program: The main learning and educational goals of this subject are "(G) Understanding of Engineer Ethics, G-1: Deepening Understanding of Ethical, Economic and Safety Consideration, Engineers Being aware of the responsibility to society and being able to explain it, but incidentally, it is also involved in "B-1".</p> <p>Class outline: Modern society is built on many technologies, and misuse of technologies can pose a serious crisis to society and nature. For this reason, engineers must have a responsibility to correctly understand the meaning of the technology they handle and to make it useful for society and nature. From this point of view, we deal with engineering ethics in general.</p>
Style	<p>Class method: Classes are conducted in various ways such as board writing, projectors, discussions, and presentations, mainly through case studies in the fields of machinery / control and electronics / information. It is necessary to think for yourself, investigate, and actively exchange opinions.</p> <p>Grade evaluation method: The grades of the first half (Miyashita) and the second half (Hosoya) are evaluated equally. In the first half, group reports are evaluated at 40%, and individual reports including evaluations by others are evaluated at 60%. In the second half, reports including report assignments are evaluated at 60%, and group discussions and presentations are evaluated at 40%.</p>
Notice	<p>Precautions for taking this course: This course is a "course that requires study outside of class hours". Classes are offered for 15 credit hours per credit, but 15 credit hours are required in addition to this. Follow the instructions of your instructor for these studies.</p> <p>Course advice: Courses that include essential content in the engineer education program. Those who aim to play an active role as engineers in the future must take this course. "This subject is related to environmental education and nuclear core human resource development. 』</p> <p>Basic subjects: Ethics (1 year) and Engineering Ethics (5), general engineering subjects, basic knowledge related subjects such as society, economy, nature, environment, companies, etc. : Advanced technology special lecture (special 1, specialized) 2), Special Research (Special 1, Special 2), Environmental Science (Special 1), Contemporary Philosophy (Special 2), Bioengineering (Special 1), etc.</p> <p>Advice on Courses: General Course Faculty of Industrial Ethics (5) Following the overview, this subject taught by a professional teacher aims at more practical engineering ethics education. A broad perspective on science / technology, manufacturing, society / economy, companies, the global environment, etc. is important. This subject is an environmental education related subject.</p> <p>In this lecture, attendance less than 30 minutes from the start of class will be delayed, and attendance after that will be treated as absent.</p>

#### Characteristics of Class / Division in Learning

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#### E l e c t i v e s u b j e c t s

#### Course Plan

			Theme	Goals
1st Semester	1st Quarter	1st	• Guidance	Understand the purpose of education, learning content, evaluation method, etc. Also, decide the discussion group in the first half
		2nd	• Learning content outside class hours: Report on discussion content (weekly)	
		3rd	• Determining discussion issues and division of roles within the group	Understand and explain the items on the left
		4th	• Learning content outside class hours: • Survey and organization based on discussion content (weekly)	
		5th	• Group discussion 1 [Clarification of discussion points]	Understand and explain the items on the left
		6th	• Learning content outside class hours: • Preparation for general discussion	
		7th	• Group discussion 2 [Summary for general discussion]	Understand and explain the items on the left
		8th	• Learning content outside class hours: Preparation of presentation materials	
	2nd Quarter	9th	• Overall discussion [evaluation by others]	Understand and explain the items on the left
		10th	• Learning content outside class hours: Survey on issues to be examined	
		11th	• Regroup discussion after general discussion	Understand and explain the items on the left
		12th	• Learning content outside class hours: Meeting for preparation of general report	
		13th	• Summary of group discussions, report preparation	Summarize the results of group discussions regarding the content of the first half of the discussion

		14th	• Learning content outside class hours: Preparation of group reports and individual reports	
		15th	• Guidance	
		16th	• Learning content outside class hours: [Preparation for discussion]	

#### Evaluation Method and Weight (%)

	Examination	Presentation	Mutual Evaluations between students	Self Evaluation	Task	Group discussion	Total
Subtotal	0	20	5	0	55	20	100
Basic Proficiency	0	0	0	0	0	0	0
Specialized Proficiency	0	0	0	0	0	0	0
Cross Area Proficiency	0	20	5	0	55	20	100

Tsuyama College		Year	2021		Course Title	Experiments of Mechanical and Control Systems	
Course Information							
Course Code	0021		Course Category	Specialized / Compulsory			
Class Format	Experiment		Credits	School Credit: 4			
Department	Advanced Mechanical and Control System Engineering Course		Student Grade	Adv. 1st			
Term	Year-round		Classes per Week	4			
Textbook and/or Teaching Materials	Textbooks:Distribute prints individually at each experiment site , Reference books :Specialized textbooks for mechanical and electronic control systems						
Instructor	NOMURA Kensaku,INOUE Hiroyuki						
Course Objectives							
Learning purposes : Based on the recognition that student experiments are training for experimental research, the purpose is to acquire basic experimental methods and results analysis methods and thinking skills.							
Course Objectives : 1. Being able to make systematic efforts while forming a common understanding with others to solve problems. 2. Being able to properly handle the concept of experimental design, handling of equipment, and data analysis, and to be able to consider engineering. ◎Acquire the ability to express the concept in figures, sentences, formulas, programs, etc., and the communication ability to summarize these in a report.							
Rubric							
	Excellent	Good	Acceptable	Not acceptable			
Achievement 1	<ul style="list-style-type: none"><li>• You can voluntarily explore issues and come up with more innovative and rational answers.</li><li>• When a new problem is discovered in the process of searching for a problem, the problem can be dealt with in consultation with a collaborator.</li></ul>	<ul style="list-style-type: none"><li>• Able to voluntarily set and explore issues based on a common understanding with cooperators in relation to various social events.</li><li>• Be able to make systematic efforts while forming a common understanding with cooperators.</li></ul>	<ul style="list-style-type: none"><li>• Be able to voluntarily set and explore issues related to various social events.</li><li>• Be able to tackle issues while forming a common understanding with collaborators.</li></ul>	It has not reached the left.			
Achievement 2	<ul style="list-style-type: none"><li>• You can collect information from literature and the Internet and use your unique expertise to analyze experimental data accurately.</li><li>• For unexpected results, you can think about the cause and draw an accurate conclusion.</li></ul>	<ul style="list-style-type: none"><li>• You can understand the contents of the experiment and make an appropriate and efficient experiment plan by yourself based on this.</li><li>• You can understand the experimental equipment and methods, and explain the process and results of the experiment logically.</li></ul>	<ul style="list-style-type: none"><li>• You can understand the contents of the experiment and the concept of the experiment plan.</li><li>• You can understand the experimental equipment and explain the process and results of the experiment.</li></ul>	It has not reached the left.			
Achievement 3	<ul style="list-style-type: none"><li>• You can formulate the structure of the report and summarize the experimental methods, analysis results and considerations appropriately and concisely.</li><li>• You can create reports that are easy to read and understand by using various computer software in an integrated manner.</li></ul>	<ul style="list-style-type: none"><li>• You can formulate the structure of the report yourself and summarize the experimental methods and analysis results appropriately.</li><li>• You can use various computer software appropriately and effectively, and express your ideas with figures, sentences, formulas, programs, etc.</li></ul>	<ul style="list-style-type: none"><li>• You can understand the basic structure of the report and summarize the experimental methods and analysis results.</li><li>• You can use computer software to express your ideas with figures, sentences, formulas, programs, etc.</li></ul>	It has not reached the left.			
Assigned Department Objectives							
Teaching Method							
Outline	General or Specialized : Specialized Field of learning : Engineering Foundational academic disciplines : Mechanical Engineering ・ Electrical and Electronic General Relationship with Educational Objectives : This class is equivalent to "(3) The student has acquired deeper technical knowledge through practical learning of specialty lab experiments, and at the same time acquired the ability to effectively perform experiments and analyze data". Relationship with JABEE programs : The main goals of learning / education in this class are "(D),D-3", also "A-3" , "C-1" and "D-1" are involved. Course outline : Mechanical systems are often a fusion of machinery and control technology, and knowledge of machinery and control-related fields must be mutually understood. Therefore, we will confirm a wide range of knowledge about machines and control systems through experiments.						



Style	<p>Course method : Please note that there are experiments conducted separately and experiments conducted in common by graduates of the mechanical and electronic control departments, and design projects as efforts to solve problems. The weekly experiment theme will be instructed separately, so follow it. Individual guidance will be given on how to set and proceed with the theme of the design project, and how to write and consider the experimental report.</p> <p>Grade evaluation method : Present some experimental tasks and have them systematically work on understanding the contents of each task and solving the tasks. Through exchange of opinions and discussions, students are asked to confirm the roles of themselves and others and to judge whether or not they have fulfilled their respective roles, and evaluate the results by compiling them in a mutual evaluation form or report. In addition, pass / fail is judged based on the total average score of the experiment (50%) and the design project (50%). For experiments, each instructor comprehensively judges the experiment report and the handling of the experimental equipment, and gives an evaluation score, and weights and averages each experiment time. All reports must be submitted.</p>
Notice	<p>Precautions on the enrollment : This is a class that requires study outside of class hours. A total of 45 hours of study is required per credit, including both class time and study outside class time. Follow the instructions of the instructor regarding study outside of class hours.</p> <p>Course advice : Advance preparation varies depending on each experiment, so follow the instructions of the instructor. After the experiment is over, start writing the report as soon as possible.</p> <p>Foundational subjects : General specialized subjects in mechanical and electronic control departments</p> <p>Related subjects : General specialized subjects in the Advanced Mechanical and Control System Engineering Course</p> <p>Attendance advice : Start your design project early without procrastination.</p>

### Characteristics of Class / Division in Learning

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### Required subjects

#### Course Plan

			Theme	Goals
1st Semester	1st Quarter	1st	Guidance, guidance on the experimental location Examination of design project initiatives	You can follow the guidance to understand your goals and attitudes and make an annual plan.
		2nd	Examination of design project issues and grouping work	You can make an annual plan for a design project while having a common understanding with your collaborators.
		3rd	From this point onward, described in order of for Mechanical Systems Program graduates / for Advanced Science Program graduates / design project . TeX-1 / Mechanical Engineering Experiment Examination of design project initiatives	In TeX-1 / mechanical experiments, you can prepare for experiments, operate experimental equipment, and organize and consider experimental results. Information can be collected from literature and the Internet.
		4th	TeX-2 / Mechanical Engineering Experiment Design project 1st group discussion	In TeX-2 / mechanical experiments, you can prepare for experiments, operate experimental equipment, and organize and consider experimental results. Be able to explain your role in collaboration with others.
		5th	TeX-3 / Mechanical Engineering Experiment Examination of design project initiatives	In TeX-3 / mechanical experiments, you can prepare for experiments, operate experimental equipment, and organize and consider experimental results. Explain the method for solving the problem.
		6th	TeX-4 / Thermal Engineering 1-1 Experiment Examination of design project initiatives	In the TeX-4 / Thermal Engineering 1-1 experiment, you can prepare for the experiment, operate the experimental equipment, and organize and consider the experimental results. Explain the method for solving the problem.
		7th	PLC-1 / Thermal Engineering 1-2 Control Experiment Formulation of annual design project plan	PLC-1 / Thermal Engineering 1-2 Experiment allows you to prepare for the experiment, operate the experimental equipment, and organize and consider the experimental results. You can make an annual plan for the entire project.
		8th	PLC-2 / fluid experiment 1 Design project 2nd group discussion	PLC-2 / Fluid Experiment 1 allows you to prepare for the experiment, operate the experimental equipment, and organize and consider the experimental results. The group can make an annual plan with a common understanding.
	2nd Quarter	9th	Design project theme presentation material creation / fluid experiment 2 Formulation of annual design project plan	The group can make an annual plan with a common understanding. In Fluid Experiment 2, you can prepare for the experiment, operate the experimental equipment, and organize and consider the experimental results.
		10th	Design project theme presentation	You can explain the contents of the project in an easy-to-understand manner.

2nd Semester		11th	Positioning experiment 1 / Work experiment 1 Promotion of design project research and research	In Positioning Experiment 1 / Work Experiment 1, you can prepare, operate the experimental equipment, and organize and consider the experimental results. Be able to investigate the background of the project and show its technical significance.
		12th	Positioning experiment 2 / Work experiment 2 Promotion of design project research and research	In Positioning Experiment 2 / Work Experiment 2, you can prepare, operate the experimental equipment, and organize and consider the experimental results. Be able to investigate the background of the project and show its technical significance.
		13th	Promotion of design project research · research / work experiment 3 Promotion of design project research and research	Be able to investigate the background of the project and show its technical significance. / In work experiment 3, you can prepare, operate the experimental equipment, and organize and consider the experimental results. Be able to investigate the background of the project and show its technical significance.
		14th	Control experiment 1 / Promotion of design project survey / research Promotion of design project research and research	In Control Experiment 1, you can prepare, operate the experimental equipment, and organize and consider the experimental results. / Be able to investigate the background of the project and show its technical significance. You can find a way to solve the problem.
		15th	Control experiment 2 / Promotion of design project survey / research Promotion of design project research and research	In Control Experiment 2, you can prepare, operate the experimental equipment, and organize and consider the experimental results. / Be able to investigate the background of the project and show its technical significance. You can find a way to solve the problem.
		16th	Paper plane 1 / Control experiment 1 Promotion of design project research and research	In Paper Plane 1 / Control Experiment 1, you can prepare, operate the experimental equipment, and organize and consider the experimental results. Be able to show how to solve problems and necessary experiments.
	3rd Quarter	1st	Paper plane 2 / Control experiment 2 Promotion of design project research and research	In Paper Plane 2 / Control Experiment 2, you can prepare, operate the experimental equipment, and organize and consider the experimental results. Be able to show how to solve problems and necessary experiments.
		2nd	Paper plane 3 / Promotion of design project research and research Promotion of design project research and research	Paper plane 3 allows you to prepare, operate experimental equipment, and organize and consider experimental results. / Can perform and summarize the experiments required for the project. You can perform and summarize the experiments required for the project.
		3rd	Paper Plane 4 / Design Project Interim Report Meeting Material Creation Creating materials for the design project interim report meeting	Paperplane 4 allows you to prepare, operate experimental equipment, and organize and consider experimental results. / Can summarize the progress of the project. You can summarize the progress of the project.
		4th	Design project interim report meeting	Be able to explain the progress of the project in an easy-to-understand manner.
		5th	Thermal Engineering Experiment 1 / Analysis of Design Project Results Analysis of design project results	In Thermal Engineering Experiment 1, you can prepare, operate the experimental equipment, and organize and consider the experimental results. / You can summarize and consider the results of the project. You can show how to organize a project in a group.
		6th	Thermal Engineering Experiment 2 / Analysis of Design Project Results Analysis of design project results	In Thermal Engineering Experiment 2, you can prepare, operate the experimental equipment, and organize and consider the experimental results. / You can summarize and consider the results of the project. You can show how to organize a project in a group.
		7th	Analysis of design project results / Thermal engineering experiment 1 Analysis of design project results	The results of the project can be summarized and considered. / In Thermal Engineering Experiment 1, you can prepare, operate the experimental equipment, and organize and consider the experimental results. You can summarize and consider the results of the project.
		8th	Chemistry · Biological Experiment 1 / Thermal Engineering Experiment 2 Analysis of design project results	In Chemistry · Biological Experiment 1 / Thermal Engineering Experiment 2, you can prepare, operate experimental equipment, and organize and consider experimental results. The results of the project can be summarized and considered.
	4th Quarter	9th	Chemistry · Biological Experiment 2 / Material Experiment 1 Analysis of design project results	In Chemistry / Biological Experiment 2 / Material Experiment 1, you can prepare, operate experimental equipment, and organize and consider experimental results. The results of the project can be summarized and considered.

		10th	Chemistry ・ Biological Experiment 3 / Material Experiment 2 Creation of design project result report	In Chemistry ・ Biological Experiment 3 / Material Experiment 2, you can prepare, operate experimental equipment, and organize and consider experimental results. By utilizing various computer software in an integrated manner, it is possible to create reports that are easy to read and understand.
		11th	Chemistry ・ Biological Experiment 4 / Material Experiment 3 Creation of design project result report	In Chemistry ・ Biological Experiment 4 / Material Experiment 3, you can prepare, operate experimental equipment, and organize and consider experimental results. By utilizing various computer software in an integrated manner, it is possible to create reports that are easy to read and understand.
		12th	Design project result report creation Group discussion	By utilizing various computer software in an integrated manner, it is possible to create reports that are easy to read and understand.
		13th	Design project presentation material creation Creation of presentation materials for the final debriefing session of the design project	You can use presentation software to create presentation manuscripts for debriefing sessions.
		14th	Design project final debriefing session preparation	You can explain the outcome of the project to others in an easy-to-understand manner.
		15th	Design project final debriefing session Creation of design project result report, work diary, discussion record	You can compile a report of the results of your project.
		16th	Submission of design project result report, work diary, discussion record	You can create highly complete results reports, etc.

#### Evaluation Method and Weight (%)

	Examination	Presentation	Mutual Evaluations	Task	Portfolio	Other	Total
Subtotal	0	45	5	50	0	0	100
Basic Proficiency	0	0	0	0	0	0	0
Specialized Proficiency	0	45	5	50	0	0	100
Cross Area Proficiency	0	0	0	0	0	0	0

Tsuyama College		Year	2021	Course Title	Practical English II
Course Information					
Course Code	0026		Course Category	General / Elective	
Class Format	Lecture		Credits	Academic Credit: 2	
Department	Advanced Mechanical and Control System Engineering Course		Student Grade	Adv. 2nd	
Term	First Semester		Classes per Week	2	
Textbook and/or Teaching Materials	Successful Keys to the Toeic, Goal 500; Handouts, Dictionary				
Instructor	RAMBO Eric				
Course Objectives					
<p>[Learning purpose]          Improve overall English ability as measured by the TOEIC. To improve presentation and communication skills by presenting research results and interacting with the audience.</p> <p>[Course Objectives]          1. Develop the English communication skills and acquire basic English proficiency to understand and convey basic information and ideas about familiar matters and one's specialty.          2. Be able to give presentations at a level that is appropriate for international conferences.          3. To raise the score of language tests such as TOEIC as a means of measuring your achievement.          © After understanding the other person, such as a technician or the general public, you can convey your own opinions and thoughts in an easy-to-understand manner and devise an explanation method, and gain a sufficient understanding.</p>					
Rubric					
	Ideal Level		Standard Level		Unacceptable Level
Achievement 1	Has acquired very well English proficiency to understand and convey basic information and ideas about familiar matters and one's specialty.		Has acquired generally well English proficiency to understand and convey basic information and ideas about familiar matters and one's specialty.		Has not acquired English proficiency to understand and convey basic information and ideas about familiar matters and one's specialty.
Achievement 2	Has acquired sufficient presentation skills in English for international conferences.		Has generally acquired sufficient presentation skills in English for international conferences.		Has not acquired sufficient presentation skills in English for international conferences.
Achievement 3	Can solve TOEIC 450-point level vocabulary, grammar, reading comprehension, and listening comprehension problems.		Can generally solve TOEIC 450-point level vocabulary, grammar, reading comprehension, and listening comprehension problems.		Cannot solve TOEIC 450-point level vocabulary, grammar, reading comprehension, and listening comprehension problems.
Assigned Department Objectives					
Teaching Method					
Outline	General / specialized / learning fields: general / foreign languages Basic disciplines: English, English and American literature, linguistics, phonetics Relationship with advanced course learning goals: The purpose of this course is "(6) Understanding the importance of seeing things from a global perspective while coordinating with the local community through off-campus training, special lectures on advanced technology, and participation in academic societies." Relationship with engineer education program: The main goals of learning and education in this subject are "(F) Development of communication ability and presentation ability, F-3: To be able to communicate in English, which is an essential foreign language for engineers." Class outline: Students will be able to make presentations in English while learning expressions and techniques that are frequently used in presentations, and also prepare for the TOEIC test.				
Style	Class method: To be able to express what you want to say in English by using the expressions studied in the class. At the same time, we will use the TOEIC textbook to prepare for taking the TOEIC test. Grade evaluation method: Weekly exercises (assignments, quizzes, PowerPoint presentation.) 50%, and the results of two regular examinations 50%.				
Notice	Precautions for taking this course: This course is a "course that requires study outside of class hours". A total of 45 hours of study is required per credit, including the class hours and study outside of class hours. For study outside of class hours, follow the instructions from the instructor. Course advice: Actively participate in the class and submit the assignments within the deadline. Given the current situation in which TOEIC is widely accepted as a means of judging English proficiency, have a positive attitude towards taking the TOEIC test. Basic subjects: English IV (4th), Elective English I (4), English V (5), Elective English II (5), Practical English I (Special 1) Related subjects: Technical English reading (Specialty 1) Attendance advice: Admission after the start of class is considered to be late, and one credit hour will be counted for two late arrivals.				
Characteristics of Class / Division in Learning					
<input checked="" type="checkbox"/> Active Learning		<input type="checkbox"/> Aided by ICT		<input type="checkbox"/> Applicable to Remote Class	
				<input type="checkbox"/> Instructor Professionally Experienced	
Elective subjects					
Course Plan					
			Theme	Goals	
1st Semester	1st Quarter	1st	Course introduction, e-learning, TOEIC study method.	Understand the goals and methods of the course.	
		2nd	Writing your Curriculum Vitae (CV) in English. TOEIC Unit 8	Understand the structure and purpose of the CV. Effective TOEIC practice.	

		3rd	Writing about your background experience. TOEIC Unit 8	Good explanation with correct grammar. Effective TOEIC practice.
		4th	Writing about your skills. TOEIC Unit 9	"
		5th	Writing about your work experience and interests. TOEIC Unit 9	"
		6th	Submit your CV; Conduct a job interview in English.	Write a well-explained and correct CV; Give good answers in the job interview.
		7th	Prepare for the Midterm Exam	Know all the vocabulary and grammar for the TOEIC units; Explain your CV in writing.
		8th	Midterm Exam	
	2nd Quarter	9th	Return Midterm Exam and correct mistakes. TOEIC Unit 10	Learn from mistakes. Effective TOEIC practice.
		10th	Start PPT about "My Current Research". TOEIC Unit 10	Good explanation with correct grammar. Effective TOEIC practice.
		11th	Explain research topic and goals. TOEIC Unit 11	"
		12th	Explain research method and equipment. TOEIC Unit 11	"
		13th	Explain results and who would use your research. TOEIC Unit 12	"
		14th	Prepare for the Final Exam.	Know all the vocabulary and grammar for the TOEIC units; Explain your "Current Research" in writing.
		15th	Final Examination	
		16th	Return Final Exam and correct mistakes. Summary of English learning strategies.	Learn from mistakes. Plan for future English learning.

#### Evaluation Method and Weight (%)

	Examination	Presentation	Mutual Evaluations between students	Behavior	Portfolio	Other	Total
Subtotal	50	30	0	0	0	20	100
Basic Proficiency	50	30	0	0	0	20	100
Specialized Proficiency	0	0	0	0	0	0	0
Cross Area Proficiency	0	0	0	0	0	0	0

Tsuyama College		Year	2021		Course Title	Social Sciences
Course Information						
Course Code	0027			Course Category	General / Elective	
Class Format	Lecture			Credits	Academic Credit: 2	
Department	Advanced Mechanical and Control System Engineering Course			Student Grade	Adv. 2nd	
Term	Second Semester			Classes per Week	2	
Textbook and/or Teaching Materials	SANO Naoko, Syakaigengogaku no manazasi, Sangensya, Tokyo, 2015					
Instructor	KADOYA Hidenori					
Course Objectives						
Learning objective: The purpose of this course is to immerse students in ways of thinking in fields other than their own, and to provide them with an education that will provide a background for the cultivation of their humanity. Objective: To understand human beings, society, and culture from the perspective of social science, and to cultivate an awareness and a desire to contribute proactively to the solution of social problems as a member of international society. Cultivate an interest in the role and impact of human activities and science and technology, and cultivate an awareness and a desire to contribute to society as an engineer while pursuing the question of what happiness means.						
Rubric						
	Excellent	Good	Acceptable	Unacceptable		
Achievement 1	Attend class fully	Attend at least 2/3 of the classes.	Attend at least 2/3 of the classes.	More than 6 absences		
Achievement 2	Submit a report and/or give an oral report that fully complies with instructions	Submit a report and/or give an oral report with some degree of compliance with instructions.	Submit a report and/or provide an oral report in accordance with the instructions, at a minimum.	Not submitting reports and/or oral reports as instructed		
Assigned Department Objectives						
Teaching Method						
Outline	General or Specialized : General Field of learning : Social science,Sociology Relationship with Educational Objectives (5) Attain a global perspective and understanding of social development Relationship with JABEE programs :The main goals of learning / education in this class are B-2.					
Style	Course Method: Each week, the assigned lecturer will give a lecture to the students, asking for their opinions and further developing the discussion.  Grade evaluation method: Submission Assignment (100%) or Oral Report (100%). Sufficient participation is a prerequisite to be assessed. Assignments are due the week after the assignment is presented, and assessment of the work outside of class time is based on its content.					
Notice	Note: This is a compulsory course. 15 credit hours of classes per credit, plus 30 credit hours of study per credit must be completed. Students must follow the instructions of the instructor.  Course Advice: This course requires students to have a high level of motivation, intellectual curiosity, and positive attitude. Students are encouraged to speak up in class. There will be no penalties for being late for class, but students' autonomy is strongly encouraged.  Foundational subjects: World History, Politics and Economics, Japanese History, Humanity and Culture, Humanity and Society  Related subjects: none.  Advice: This course requires students to have a strong desire to learn, intellectual curiosity, and positive attitude. Students are encouraged to speak up in class. There will be no penalties for being late for class, but students are expected to be autonomous.					
Characteristics of Class / Division in Learning						
<input type="checkbox"/> Active Learning		<input type="checkbox"/> Aided by ICT		<input type="checkbox"/> Applicable to Remote Class		<input type="checkbox"/> Instructor Professionally Experienced
Course Plan						
			Theme	Goals		
2nd Semester r	3rd Quarter	1st	Introduction. What is social science?	Each week below, you must participate in a fully prepared report/presentation.		
		2nd	On social scientific thinking			
		3rd	Seminar-style exercises			
		4th	Seminar-style exercises			
		5th	Seminar-style exercises			
		6th	Seminar-style exercises			
		7th	Seminar-style exercises			
		8th	Seminar-style exercises			
	4th Quarter	9th	Seminar-style exercises			
		10th	Seminar-style exercises			
		11th	Seminar-style exercises			
		12th	Seminar-style exercises			

		13th	Seminar-style exercises	
		14th	Seminar-style exercises	
		15th	(Final exam)	
		16th	Seminar-style exercises	

Evaluation Method and Weight (%)

	Examination	Presentation	Mutual Evaluations between students	Behavior	Assignment	Other	Total
Subtotal	0	0	0	0	100	0	100
Basic Proficiency	0	0	0	0	100	0	100
Specialized Proficiency	0	0	0	0	0	0	0
Cross Area Proficiency	0	0	0	0	0	0	0

Tsuyama College		Year	2021		Course Title	Modern Philosophy	
Course Information							
Course Code		0028		Course Category		General / Elective	
Class Format		Lecture		Credits		Academic Credit: 2	
Department		Advanced Mechanical and Control System Engineering Course		Student Grade		Adv. 2nd	
Term		Second Semester		Classes per Week		2	
Textbook and/or Teaching Materials		None					
Instructor		KAMIYA Ken					
Course Objectives							
The aim of this class is to enable students to recognize their responsibility as engineers towards society through the systematic study of the problems of contemporary philosophy.							
Rubric							
	Excellent		Good		Acceptable		Not acceptable
Achievement 1	The student understands the historical background and importance of contemporary philosophy and can explain very well its details.		The student understands the historical background and importance of contemporary philosophy and can explain the basics of its issues in detail.		The student understands the historical background and importance of contemporary philosophy and can explain its basic issues.		The student has not reached these levels.
Achievement 2	The student understands the problems and concepts of contemporary philosophy and can explain them expansively in detail.		The student understands the problems and concepts of contemporary philosophy and can explain the basics of its issues in detail.		The student understands the problems and concepts of contemporary philosophy and can explain its basic issues.		The student has not reached these levels.
Achievement 3	The student has gained an interest in the public welfare and can express the unique nature of herself and of others expansively and in detail.		The student has gained an interest in the public welfare and can express in detail the unique nature of herself and of others in a basic manner.		The student has gained an interest in the public welfare and can express the unique nature of herself and of others in a basic manner.		The student has not reached these levels.
Assigned Department Objectives							
Teaching Method							
Outline	General or Specialized : General Field of learning : Humanities Foundational academic disciplines : philosophy/ethics Relationship with Educational Objectives : This class corresponds to goal "(5)" of the advanced engineering course. Relationship with JABEE programs : The main goal of learning and education in this subject is "G". Course outline : Education in ethics is a necessary culture for contemporary engineers and researchers in the field of engineering. This year, we will inquire further into the character of our technological society through the treatment of fundamental philosophical and ethical problems.						
Style	Course method : Classes will be held in the second semester. Teaching will be conducted mainly through discussion with students. Students will be expected to study outside of the classroom to prepare their coursework. Grade evaluation method: One paper (50%) and one presentation or report on the contents of the course (50%). There will be no makeup exams.						
Notice	Precautions on the enrollment : This is a class that requires study outside of class hours. A total of 45 hours of study is required per credit, including both class time and study outside class time. Follow the instructions of the instructor regarding study outside of class hours. Advice concerning enrollment: Since it will be obligatory to submit a paper, read newspapers etc. on a daily basis and form your own interests. Organize what you have learned and whatever questions you may have after each class to prepare for the next class. Foundational subjects : Ethics (All programs, 1st year), Engineering Ethics (All programs, 5th year) Related subjects : Engineering Ethics (Advanced course, 1st year) Attendance advice : Although participation in itself will not be evaluated, students should attend at least 2/3 of the classes. Although students who repeatedly arrive late will not be considered absent for that reason, students who come excessively late will be considered absent.						
Characteristics of Class / Division in Learning							
<input checked="" type="checkbox"/> Active Learning		<input checked="" type="checkbox"/> Aided by ICT		<input checked="" type="checkbox"/> Applicable to Remote Class		<input type="checkbox"/> Instructor Professionally Experienced	
Elective subjects							
Course Plan							
			Theme		Goals		
2nd Semester	3rd Quarter	1st	Introduction		General explanation of the goals		
		2nd	The Foundations of Contemporary Philosophy		Goals 1 & 3		
		3rd	The Foundations of Contemporary Philosophy		Goals 1 & 3		
		4th	The Foundations of Contemporary Philosophy		Goals 1 & 3		
		5th	The Development of Contemporary Philosophy		Goals 1 & 3		
		6th	The Development of Contemporary Philosophy		Goals 1 & 3		
		7th	The Development of Contemporary Philosophy		Goals 1 & 3		
		8th	The Development of Contemporary Philosophy		Goals 1 & 3		



	4th Quarter	9th	Contemporary Philosophy and Technology	Goal 2
		10th	Contemporary Philosophy and Technology	Goal 2
		11th	Contemporary Philosophy and Technology	Goal 2
		12th	Contemporary Philosophy and Society	Goals 2 & 3
		13th	Contemporary Philosophy and Society	Goals 2 & 3
		14th	Contemporary Philosophy and Society	Goals 2 & 3
		15th	Contemporary Philosophy and Society	Goals 2 & 3
		16th	Explanation of Evaluation	Goal 3

#### Evaluation Method and Weight (%)

	Examination	Presentation	Mutual evaluations between students	Self Assessment	Assignment	Mini exams	Total
Subtotal	0	50	0	0	50	0	100
Basic Proficiency	0	40	0	0	40	0	80
Specialized Proficiency	0	0	0	0	0	0	0
Cross Area Proficiency	0	10	0	0	10	0	20

Tsuyama College		Year	2021		Course Title	Special Lecture on Advanced Engineering
Course Information						
Course Code	0022		Course Category	Specialized / Elective		
Class Format	Lecture		Credits	Academic Credit: 1		
Department	Advanced Mechanical and Control System Engineering Course		Student Grade	Adv. 2nd		
Term	Intensive		Classes per Week			
Textbook and/or Teaching Materials	Distribute reference materials as needed.					
Instructor	HOSOTANI Kazunori,TERAMOTO Takayuki,KONISHI Daijiro					
Course Objectives						
Learning purposes : By learning about the ever-increasing technological trends and recognizing the importance of technology in society, this subject will provide hints for new developments in research and learning.						
Course Objectives : 1. Be able to know the trends of advanced technology, understand the contents of technology and engineering required in the world, and explain the outline appropriately. 2. Considering the relationship with society and the impact of technology on society, you can express your own thoughts and opinions regarding the direction of advanced technology.						
Rubric						
	Excellent		Good		Acceptable	Not acceptable
Achievement 1	You can thoroughly investigate the content of the lecture and write a exemplary report according to the task, including the content.		You can investigate the content of the lecture and write a exemplary report according to the task, including the content.		For tasks, you can write a report according to the task.	You have not reached the level shown on the left.
Achievement 2	Considering the relationship with society and the impact of technology on society, you can write a exemplary report that fully includes your own thoughts and opinions.		Considering the relationship with society and the impact of technology on society, you can write a exemplary report that includes your own thoughts and opinions.		You can write a report that includes your own thoughts and opinions.	You have not reached the level shown on the left.
Assigned Department Objectives						
Teaching Method						
Outline	* Relationship with practice: This subject participates in lectures and workshops designated by the advanced course and tackles the designated tasks. The lecture will be held by inviting lecturers who are involved in front-end technology at companies etc. Students will learn about the technological trends and the progress of the research in various fields, broaden your horizons, and learn about the impact of technology on society.					
	General or Specialized : Specialized Field of learning : Common and basics of natural science Foundational academic disciplines : Engineering / social Science					
	Relationship with Educational Objectives : This class is equivalent to "(6) Through extracurricular activities and participation in advanced technology lectures and academic societies, the student has learned to work with local communities and as well has acquired a global perspective".					
	Relationship with JABEE programs : The main goal of learning / education in this class is "(A) A-1". Accompanyingly, it is also involved in "G-1". Since the content is diverse, it may be related to the development of humanity from a global perspective and the development of comprehensive abilities in collaboration with local communities.					
	Course outline : This is a special lecture to learn about the contents directly related to the student's specialty, the technological trends and the progress of the research in each of the surrounding fields. Deepen your knowledge and broaden your horizons, and learn a wide range of relationships with society and the impact of technology on society.					
Style	Course method : Students will independently select assignments from lectures, workshops, remote learning classes, etc. designated by the advanced course, participate in them, and complete the designated tasks. Information will be posted on the advanced course website and e-mail, so do not overlook it.					
	Grade evaluation method : The instructor in charge will specify each task individually, but it is mainly based on the evaluation of the report on the task after the lecture. Participate in 7 or more lectures held as this subject, submit 4 or more small assignments, and get a passing score. If you get a passing score in 4 or more small tasks, the final credits will be approved by the Advanced Course Steering Committee at the end of the school year based on the 4 average scores from the one with the best grade.					

Notice	Precautions on the enrollment : This subject is a "subject that requires study outside of class hours". A total of 45 hours of study is required per credit, including the class hours and study outside of class hours. For study outside of class hours, follow the instructions of the instructor. This subject is a special lecture, and you should be aware that the essence is only spoken in a short time in the lecture, take time for learning other than the lecture, and take sufficient time to tackle the tasks.
	Course advice : Download and print the advanced technology special lecture attendance confirmation form from the advanced course homepage in advance. Since it will be implemented on a wide range of themes, it is important to make efforts to expand knowledge without sticking to a narrow specialty. Therefore, as preparatory learning to be performed in advance, it is useful to learn the current situation and trends of front-end technology in Japan and overseas by reading the Nikkan Kogyo Shimbun and Nihon Keizai Shimbun.
	Foundational subjects : All the subjects you have learned.
	Related subjects : All the subjects you will learn.
	Attendance advice : This subject is related to nuclear human resources development. Since the class will be mainly conducted by an outside lecturer, be careful not to be rude as a student of our school.

#### Characteristics of Class / Division in Learning

<input type="checkbox"/> Active Learning	<input type="checkbox"/> Aided by ICT	<input type="checkbox"/> Applicable to Remote Class	<input checked="" type="checkbox"/> Instructor Professionally Experienced
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#### E l e c t i v e S u b j e c t s

#### Course Plan

			Theme	Goals
1st Semester	1st Quarter	1st	Guidance (conducted at the orientation at the beginning of the school year)	You can make an attendance plan for special lectures on this subject throughout the two years.
		2nd	Participation in lectures, workshops, remote learning classes, etc. designated by the instructor	You can investigate the content of the lecture and write a exemplary report according to the task, including the content. Considering the relationship with society and the impact of technology on society, you can write a exemplary report that includes your own thoughts and opinions.
		3rd	Participation in lectures, workshops, remote learning classes, etc. designated by the instructor	You can investigate the content of the lecture and write a exemplary report according to the task, including the content. Considering the relationship with society and the impact of technology on society, you can write a exemplary report that includes your own thoughts and opinions.
		4th	Participation in lectures, workshops, remote learning classes, etc. designated by the instructor	You can investigate the content of the lecture and write a exemplary report according to the task, including the content. Considering the relationship with society and the impact of technology on society, you can write a exemplary report that includes your own thoughts and opinions.
		5th	Participation in lectures, workshops, remote learning classes, etc. designated by the instructor	You can investigate the content of the lecture and write a exemplary report according to the task, including the content. Considering the relationship with society and the impact of technology on society, you can write a exemplary report that includes your own thoughts and opinions.
		6th	Participation in lectures, workshops, remote learning classes, etc. designated by the instructor	You can investigate the content of the lecture and write a exemplary report according to the task, including the content. Considering the relationship with society and the impact of technology on society, you can write a exemplary report that includes your own thoughts and opinions.
		7th	Participation in lectures, workshops, remote learning classes, etc. designated by the instructor	You can investigate the content of the lecture and write a exemplary report according to the task, including the content. Considering the relationship with society and the impact of technology on society, you can write a exemplary report that includes your own thoughts and opinions.
		8th	Participation in lectures, workshops, remote learning classes, etc. designated by the instructor	You can investigate the content of the lecture and write a exemplary report according to the task, including the content. Considering the relationship with society and the impact of technology on society, you can write a exemplary report that includes your own thoughts and opinions.
	2nd Quarter	9th	It is necessary to participate in the above lectures at least 7 times	
		10th		
		11th		
		12th		
		13th		

2nd Semester		14th		
		15th		
		16th		
	3rd Quarter	1st		
		2nd		
		3rd		
		4th		
		5th		
		6th		
		7th		
		8th		
	4th Quarter	9th		
		10th		
		11th		
		12th		
		13th		
		14th		
		15th		
		16th		

#### Evaluation Method and Weight (%)

	Examination	Presentation	Mutual Evaluations between students	Behavior	Portfolio	Reports	Total
Subtotal	0	0	0	0	0	100	100
Basic Proficiency	0	0	0	0	0	0	0
Specialized Proficiency	0	0	0	0	0	100	100
Cross Area Proficiency	0	0	0	0	0	0	0

Tsuyama College		Year	2021	Course Title	Production Control Engineering
Course Information					
Course Code	0023		Course Category	Specialized / Elective	
Class Format	Lecture		Credits	Academic Credit: 2	
Department	Advanced Mechanical and Control System Engineering Course		Student Grade	Adv. 2nd	
Term	First Semester		Classes per Week	2	
Textbook and/or Teaching Materials	Textbook: 坂本賢也「生産管理入門」(理工学社), 「産業財産権標準テキスト: 特許編」(発明協会)				
Instructor	KAWAI Masahiro				
Course Objectives					
<p>Learning purposes: Learn how to manage the product management system with understanding each control item and its applicable problems, and how to write the patent specification with understanding the importance of the patent.</p> <p>Course objectives: 1. To be able to explain the role of the product management system in the company. 2. To be able to explain the fundamental methodologies of quality control. 3. To gain the manner of writing about the patent specification with the planning of the concrete patent application.</p>					
Rubric					
	Excellent	Good	Acceptable	Not acceptable	
Outline for the product management system	The student can explain the purpose and some methodologies for the product management system in detail.	The student can explain the purpose and some fundamental methodologies for the product management system.	The student can explain some fundamental methodologies for the product management system.	The student cannot explain any fundamental methodologies for the product management system.	
Quality control techniques	The student can explain the purpose and some methodologies for the quality control in details.	The student can explain the purpose and some fundamental methodologies for the quality control.	The student can explain some fundamental methodologies for the quality control.	The student cannot explain any fundamental methodologies for the quality control.	
Patent specification writing	The student can write the patent specification with understanding intellectual property rights and application process.	The student can write the patent specification with understanding fundamental thinking about intellectual property rights.	The student can explain the patent specification and fundamental thinking about intellectual property rights.	The student cannot explain the patent specification and fundamental thinking about intellectual property rights.	
Assigned Department Objectives					
Teaching Method					
Outline	<p>Connection to actual practice: The teacher has the expertise in product management and intellectual property rights with experience gained from designing electronic products in a company, conducts this class about the product management system and patent in a didactic manner mainly.</p> <p>General or Specialized: Specialized Field of learning: Basics of natural science</p> <p>Foundational academic disciplines: Machine, Control, Electrical, Electronic, and Information engineering Relationship with Educational Objectives: This class is equivalent to "(2) The student has acquired knowledge of the following specialized technical fields for designing, manufacturing, and operation of machinery and systems." Relationship with JABEE programs: the main goal of learning /education in this class is "(A)" and "(D)."</p> <p>Course outline: Learn about product management that enhances the company's productivity by controlling production activities and patent specification writing.</p>				
Style	<p>Course method: * Use a blackboard mainly. However, interactively learn through thinking the solution of concrete problems about each control item of the product management system. * Give some reports for students' comprehension. * Organize the student's presentations about the patent plan made by each of them to learn design skills.</p> <p>Grade evaluation method: Presentation (40%) + mini-exam(30%) + reports(30%) * Evaluate submission date of each report strictly. * No regular exams.</p>				
Notice	<p>Precautions on the enrollment: This class is "Required outside of teaching hours course study." Therefore, this course consists of a total of forty-five hours of teaching and homework per one unit. The student should deal with the homework based on the instructions of the teacher.</p> <p>Attendance advice: Make sure to study voluntarily by using books about quality and reliability other than the textbook and read "AAA" thoroughly.</p> <p>Foundational subjects: Applied Mathematics I (4th) Related subjects: All around subjects of advanced engineering course</p>				
Characteristics of Class / Division in Learning					
<input type="checkbox"/> Active Learning		<input type="checkbox"/> Aided by ICT		<input type="checkbox"/> Applicable to Remote Class <input checked="" type="checkbox"/> Instructor Professionally Experienced	
Elective subjects					

Course Plan						
			Theme	Goals		
1st Semester r	1st Quarter	1st	Guidance / About intellectual property rights	Understand terms about intellectual property rights		
		2nd	Patent systems	Understand some patent systems		
		3rd	Discussion about patent seeds			
		4th	Scope of claim for patent	Understand the scope of claim in the patent specification		
		5th	Patent survey and map	Understand the patent map		
		6th	Patent specification writing	Understand the patent specification		
		7th	Presentation for the patents	Make presentation about the essentials of the patent		
		8th	About product management	Understand terms about product management		
	2nd Quarter	9th	About company and organization	Understand terms about company and organization		
		10th	About the product management system	Understand terms of the product management system		
		11th	About process management	Understand terms about process management		
		12th	About quality control	Understand terms about quality control		
		13th	Statistical approaches in quality control	Understand statistical approaches in quality control		
		14th	About cost control	Understand statistical processing techniques in cost control		
		15th	About environment control	Understand management techniques in environment control		
		16th				
Evaluation Method and Weight (%)						
	Examination	Presentation	Mutual Evaluations between students	Assignment	MIni-examination	Total
Subtotal	0	40	0	30	30	100
Basic Proficiency	0	20	0	15	15	50
Specialized Proficiency	0	20	0	15	15	50
Cross Area Proficiency	0	0	0	0	0	0

Tsuyama College		Year	2021		Course Title	Practice on Regional Cooperation
Course Information						
Course Code	0024		Course Category	Specialized / Elective		
Class Format	Seminar		Credits	Academic Credit: 1		
Department	Advanced Mechanical and Control System Engineering Course		Student Grade	Adv. 2nd		
Term	First Semester		Classes per Week	1		
Textbook and/or Teaching Materials						
Instructor	HOSOTANI Kazunori,TERAMOTO Takayuki					
Course Objectives						
Learning Objective: Students will learn the role of our school as a community-based educational institution and acquire problem-solving skills for the community. In this course, students will reconfirm their own skills and knowledge, and develop new approaches to research and study through contributing to the solution of problems from regional companies and through demonstrating the fun of science, technology, and experiments to elementary and junior high school students.						
◎Implement and evaluate the design solutions developed to solve the client's requirements through collaborative work involving the local community. ◎Explain and communicate professional knowledge and skills to the general public in an easy-to-understand manner						
Rubric						
	Excellent	Good	Acceptable	Unacceptable Level		
Achievement 1	Practice and evaluate designs to solve clients' requirements, and to be able to point out additional problems and make suggestions.	Practice and evaluate designs to solve the client's requirements through collaborative activities with the local community.	Practice what they have designed to solve the client's requirements through collaborative activities in cooperation with the local community.	Cannot practice what they have designed to solve the client's requirements.		
Achievement 2	Propose and prepare teaching materials and explain professional knowledge and skills to the general public in an easy-to-understand manner.	Explain specialized knowledge and skills to the general public using the given teaching materials in an easy-to-understand manner.	Explain technical knowledge and skills to the general public using the given materials.	Cannot explain technical knowledge and skills to the general public using the given materials.		
Assigned Department Objectives						
Teaching Method						
Outline	*General or Specialized: Specialized *Field of learning: Basic subjects in natural sciences *Foundational academic disciplines: Engineering and Social Science  *Relationship with Educational Objectives: This course corresponds to the learning objectives of the major: (6) Through extracurricular activities and participation in advanced technology lectures and academic societies, the student has learned to work with Through extracurricular activities and participation in advanced technology lectures and academic societies, the student has learned to work with local communities and as well has acquired a global perspective.  *Relationship with the JABEE Program The learning and educational attainment objectives of this course are mainly "(H), H-1". Incidentally, it is also involved in "A-1" and "D-3". The content is diverse and also related to (B) and (F).  *Outline of the class: Contribute to the local community through open lectures, etc., by utilizing the knowledge and skills learned so far. In this course, students will be able to deepen their knowledge, broaden their perspectives, and learn about the relationship with society and the impact of technology on society.					
Style	*Class style Case 1: Students are expected to actively participate in the school's open lectures, visiting classes, open campus, community events, etc., and work with the teachers in charge. And submit the designated report after implementation. Case 2: The class will be conducted based on the needs of local regions.  *Grading method For those who have submitted an application for credit, evaluation will be made based on the report of the event (report). The evaluation will be approved by the Steering Committee of the Department at the end of the academic year. In the case that the course is offered as a class based on the needs of the local community, 70% of the evaluation will be based on examinations and 30% on assignments, and credits will be awarded.					

Notice	<p>This course is a "course that requires study outside of class hours. A total of 45 hours of study is required per credit, including both class time and study outside class time. Students are required to follow the instructions of the instructor regarding study outside of class hours. Advice: Download and print out the "Report on the Community Collaboration Exercise" from the website of the department in advance.</p> <p>In the case of classroom lectures, teaching materials will be distributed in electronic format so that they can be viewed during class. It is important for students to have an interest in contributing to the local community by utilizing their own specialties, and to make efforts to expand their knowledge. This is a course that can be taken over two years. Base subjects: All subjects studied so far *Note: Since the project is mainly related to the local community, be aware that you are a student of our school when you conduct the project. Students are expected to actively cooperate in activities outside their own field of expertise. Ask your teachers for information on events related to this subject.</p>
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#### Characteristics of Class / Division in Learning

<input type="checkbox"/> Active Learning	<input type="checkbox"/> Aided by ICT	<input type="checkbox"/> Applicable to Remote Class	<input type="checkbox"/> Instructor Professionally Experienced
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#### E l e c t i v e   S u b j e c t s

#### Course Plan

			Theme	Goals
1st Semester	1st Quarter	1st	Support for events 30 hours or more	
		2nd	Teaching and support at open lectures, open campus, community events, etc. in which the school is involved	
		3rd	Support multiple events for a total of 30 hours or more, and submit a report as specified. (Travel time is not included).	
		4th	Total More than 30 hours	
		5th		
		6th	Study outside class time (Instructions): Preparation for the event, preparation, and cleanup If a preparation day is set aside, it may be included in class time. Preparation of the assigned report (Forms will be provided separately)	
		7th	In 2021, according to the needs of the local community, a class on the development of basic skills for working people based on higher education will be conducted by an external lecturer.	
		8th		
	2nd Quarter	9th		
		10th		
		11th		
		12th		
		13th		
		14th		
		15th		
		16th		

#### Evaluation Method and Weight (%)

	Examination	Presentation	Mutual Evaluations between students	Behavior	Portfolio	Other	Total
Subtotal	70	30	0	0	0	0	100
Basic Proficiency	0	0	0	0	0	0	0
Specialized Proficiency	0	0	0	0	0	0	0
Cross Area Proficiency	70	30	0	0	0	0	100



Tsuyama College		Year	2021		Course Title	Thesis Work II
Course Information						
Course Code	0025		Course Category	Specialized / Compulsory		
Class Format	Experiment		Credits	School Credit: 8		
Department	Advanced Mechanical and Control System Engineering Course		Student Grade	Adv. 2nd		
Term	Year-round		Classes per Week	8		
Textbook and/or Teaching Materials						
Instructor	KONISHI Daijiro,INOUE Hiroyuki,HOSOTANI Kazunori,CHO Feifei,NONAKA Shogo,OKE Shinichiro					
Course Objectives						
Course Objectives 1. Using ICT and ICT tools to collect and analyze information in the technical field of specialization to obtain an overview of trends in advanced technology, and to understand the objective of research. 2. Form a research plan independently, conduct the experiments and analysis in details and evaluate the validity of the results. 3. Exchange opinions and ideas with many engineers through research presentations at academic conferences and practical training outside the school. 4. Contribute to the local community and the world by recognizing the responsibility that engineers bear to society and by developing the ability to evaluate corporate activities from multiple perspectives.						
Rubric						
	Excellent	Good	Acceptable	Unacceptable Level		
Achievement 1	Confirm relationship between technology and research trends by collecting, arranging, and analyzing essential information, and understand the purpose of research in relation to these trends.	Evaluate literature and materials collected through own survey and utilize the information.Think about whether the information is correct or not, and to be able to utilize it based on the literature and materials obtained through one's own investigation.	Can explain the details of documents and materials that I studied.	Cannot explain the details of documents and materials studied.		
Achievement 2	Can make plans for special research projects to solve engineering problems and analyze and explain logically.	Can make a research plan based on research objectives, and logically explain the methods and results of testing and evaluating assumptions and surveys.	Can make a research plan based on research objectives and explain the methods and results of testing and evaluating assumptions and surveys.	Cannot make a research plan based on research objectives and explain the methods and results of testing and evaluating assumptions and surveys.		
Achievement 3	Can explain opinion clearly within a time limit using basic forms of effective presentation.	Can give a presentation using basic presentation forms.	Understand basic presentation forms.	Cannot give a basic presentation.		
Achievement 4	Understand the responsibility that engineers have to society based on the impact of technology on society and nature. Make own career design and evaluate the potential fit with the company from multiple criteria.	Understand the responsibility that engineers have to society based on the impact of technology on society and nature and keep continuously improvement to become an engineer.	Can describe the responsibilities that engineers bear to society.	Cannot explain the responsibilities that engineers bear to society.		
Assigned Department Objectives						
Teaching Method						
Outline	*General or specialized: Specialized *Field of study: Experiments and practical training *Foundational academic disciplines: Engineering / Mechanical Engineering / Control Engineering  *Relationship with Educational Objectives : This subject is equivalent to “(4) By actively carrying out specialty research the student has developed the indispensable ability to solve problems and find solutions, and can creatively design and undertake research, communicate and cooperate effectively with other researchers, and present findings at academic conferences.”  *Relationship with JABEE programs : The main goals of learning / education in this class are "(E), E-1", also "A-3", "C-1", "D-1", "D-3", "E-2", "E-3", "F-1", "G-2" and "H-2" are involved. In this course, students will be involved in the development of the following abilities; “Conceptual ability in design skills”, “Ability to identify problems”, “Ability to recognize problems from the perspective of public health and safety, culture, economy, environment, and ethics”, “Ability to find a solution under the constraints arising from these problems”, “Ability to express the concept in diagrams, sentences, formulas, programs, etc.”, “Ability to plan and implement continuously”. In addition, students are required to attend a lecture on engineering ethics.  *Course outline: This course is designed for students who have received credit for Thesis Work I. It is a comprehensive course that summarizes the studies of the first and second years of the major through research activities. The results are submitted as a graduation thesis.Students are supervised in a close supervision. Joint research with companies is also actively encouraged.					

Style	<p>There are a total of 12 credit hours per week over three days. Students are required to conduct experimental or analytical research independently under the supervision of a faculty advisor for each research theme. Students will be instructed and advised on how to conduct engineering research, how to write scientific and technical papers, and how to make presentations and discussions.</p> <p><b>*Grading Method</b> In this course, students will be evaluated by several instructors, including report reviewers and presentation reviewers, based on the condition that they have fulfilled the requirements indicated in the class plan. The evaluation will be based on the presentation at the research conference (50%) and the research report (50%), and the degree of achievement will be evaluated by the presentation and the report for each of the items (A) and (C) to (H) of the educational program. The student will pass the examination with a total evaluation score of 60% or higher. If the evaluation score does not reach the passing score, the student will be given guidance and may be re-evaluated.</p>
Notice	<p><b>*Note:</b> This course is a "subject that requires study outside of class hours." A total of 45 hours of study is required per credit, including both the relevant class hours and study outside class hours. Students are required to follow the instructions of their instructors regarding study outside of class hours.</p> <p><b>*Advice for students:</b> An extremely large amount of time is allotted for this course. Students are expected to conduct research activities independently in order to maximize the results in the given environment. As preparatory studies, students are expected to make full use of the knowledge they have learned so far to plan their research projects, find out the status of their research in the field, survey relevant references, acquire experimental and analytical techniques, summarize and discuss the results, prepare papers and reports, and prepare presentations.</p> <p><b>*Basic subjects:</b> All subjects that have been studied so far Students are required to do preparatory studies and experiments as instructed by the instructor.</p> <p><b>*Advice on taking this course:</b> This is the most important and main course in the major. Therefore, students are expected to take the initiative and do their best in all aspects of the course. In the second year, students are required to submit a "Course Plan for the Integrated Studies" and "Summary of the Results of the Integrated Studies" in order to obtain a bachelor's degree from the National Institution for Academic Degrees and University Evaluation. In addition to the above, it is necessary for students to submit a research plan and a summary of the results of their studies when they receive a bachelor's degree from the National Institution for Academic Degrees and University Evaluation. Also, students are required to submit a research record at the end of the first and second semesters.</p>

#### Characteristics of Class / Division in Learning

<input checked="" type="checkbox"/> Active Learning	<input checked="" type="checkbox"/> Aided by ICT	<input type="checkbox"/> Applicable to Remote Class	<input type="checkbox"/> Instructor Professionally Experienced
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#### Course Plan

			Theme	Goals
1st Semester	1st Quarter	1st	Guidance	Recognize one's current situation at any time and consider the studies and activities that are currently necessary in order to move toward a desired future state.
		2nd	Research theme and research plan	Collect necessary information appropriately from books, the Internet, and questionnaires.
		3rd	Progress Presentation	Correctly transmit (present) information using tools and methods appropriate to the purpose and target audience.
		4th	Research theme and research plan	Know that it is necessary to consider the reliability and accuracy of collected and cited sources of information.
		5th	Research theme and research plan	Know that they are responsible for the content and scope of influence of the information they disseminate.
		6th	Research theme and research plan	Know that you must take personal information and copyright into consideration when disseminating information.
		7th	Research theme and research plan	Collect information in order to recognize the difference between the ideal state and the current state (issues).
		8th	Research theme and research plan	Read and understand texts in Japanese and certain foreign languages.
	2nd Quarter	9th	Research theme and research plan	Understand what others say in Japanese and in specific foreign languages.
		10th	Trial and verification of experiments and analysis	Understand the purpose of a conversation and carry it out in Japanese or a specific foreign language.
		11th	Trial and verification of experiments and analysis	Draw charts and graphs for smooth communication.
		12th	Trial and verification of experiments and analysis	Adopt attitudes (affirmation, repetition, body language, etc.) for smooth communication.
		13th	Trial and verification of experiments and analysis	Able to listen to others' opinions and build consensus.
		14th	Trial and verification of experiments and analysis	Learn consensus-building conversations.
		15th	Trial and verification of experiments and analysis	Practice specific methods for consensus building, such as group work and workshops.
		16th	Trial and verification of experiments and analysis	Understand and be able to practice the purpose and preparation for experiments and practical training.

2nd Semester	3rd Quarter	1st	Trial and verification of experiments and analysis	Understand and be able to practice what should be done to prevent disasters and ensure safety.
		2nd	Trial and verification of experiments and analysis	Use diagrams and tables such as characteristic factor diagrams, tree diagrams, and logic trees, which are effective in finding problems and analyzing the current situation.
		3rd	Trial and verification of experiments and analysis	Understand that problem solving requires consideration of logical procedures, not intuition or common sense.
		4th	Trial and verification of experiments and analysis	Think logically and rationally to solve problems through group work and workshops, using all kinds of techniques such as brainstorming.
		5th	Trial and verification of experiments and analysis	Identify engineering problems in a logical and rational manner.
		6th	Trial and verification of experiments and analysis	Explain to others the thought process that led to the conclusion.
		7th	Trial and verification of experiments and analysis	Propose solutions of appropriate scope and level.
		8th	Trial and verification of experiments and analysis	Express the logic of the process of reaching conclusions using words, sentences, charts, etc.
	4th Quarter	9th	Trial and verification of experiments and analysis	Act in compliance with laws and rules.
		10th	Trial and verification of experiments and analysis	Act with consideration for the circumstances of others.
		11th	Trial and verification of experiments and analysis	Recognize the impact and effects of technology on society and nature and be able to enhance the responsibility that engineers should bear to society.
		12th	Trial and verification of experiments and analysis	Organize and compose multiple pieces of information.
		13th	Writing paper	Write correctly in Japanese or a specific foreign language to communicate with others.
		14th	Writing paper	Develop logic and thinking based on facts.
		15th	Presentation	Correctly transmit (present) information using tools and methods appropriate to the purpose and target audience.
		16th	Writing paper	Understand how to write reports and be able to put them into practice.

#### Evaluation Method and Weight (%)

	Examination	Presentation	Mutual Evaluations between students	Self evaluation	Research task	Other	Total
Subtotal	0	50	0	0	50	0	100
Basic Proficiency	0	0	0	0	0	0	0
Specialized Proficiency	0	40	0	0	50	0	90
Cross Area Proficiency	0	10	0	0	0	0	10

Tsuyama College		Year	2021		Course Title	Mathematical Engineering
Course Information						
Course Code	0029		Course Category	Specialized / Elective		
Class Format	Lecture		Credits	Academic Credit: 2		
Department	Advanced Mechanical and Control System Engineering Course		Student Grade	Adv. 2nd		
Term	First Semester		Classes per Week	2		
Textbook and/or Teaching Materials	Textbooks : Haruto Ohta, "Let's Start Topological Space" (Nihonhyoronsha), Reference Books : Haruto Ohta, "Let's Solve Topological Space" (Nihonhyoronsha)					
Instructor	YOKOTANI Masaaki					
Course Objectives						
Learning purposes : Learn topology and its way of thinking.						
Course Objectives : 1. Acquire the knowledge of mathematics, computational skills, and applied skills necessary to solve basic engineering problems. 2. Understand Euclidean geometry and topology. 3. Understand Euclidean space and its shapes. 4. Understand the deformation and mapping of figures.						
Rubric						
	Excellent	Good	Acceptable	Not acceptable		
Achievement 1	Have mastered the applied skills of mathematics necessary to solve basic engineering problems.	Be familiar with the knowledge of mathematics and have mastered computational skills necessary to solve basic engineering problems.	Have acquired the knowledge of mathematics necessary to solve basic engineering problems.	Insufficient knowledge of mathematics and calculation skills necessary to solve basic engineering problems.		
Achievement 2	Understand the relationship between isometric transformations and joint transformations.	Understand the concept of topology.	Understands Euclidean geometry and similar geometry.	Lack of understanding of Euclidean geometry and topology.		
Achievement 3	Understands figure crafting, graphs, and self-similar figures.	Understand the concept of figures from a topological point of view.	Understand distance and Euclidean space.	Lack of understanding of the concept of Euclidean space and figures.		
Achievement 4	Understand the sequence of points in a shape and its convergence.	Understand the nature of mapping.	Understand that the deformation of a figure is represented by a map.	There is a lack of understanding of the deformation of figures and the sequence of points.		
Assigned Department Objectives						
Teaching Method						
Outline	General or Specialized : Specialized Field of learning : Common and basics of natural science Foundational academic disciplines : Mathematical science / mathematics / mathematics in general Relationship with Educational Objectives : This class is equivalent to "(1) To deepen the knowledge of natural science subjects centered on mathematics and physics, and acquire the ability to apply it as basic academic ability related to mechanical / control system engineering and electronic / information system engineering". Relationship with JABEE programs : The main goals of learning / education in this class are "(A), A-1". Course outline : One way to solve problems that occur in engineering is to grasp the essence of the phenomenon and cut it down from what you can understand. The significance of this lecture is to learn how to see and use useful things in such cases. Topology is a discipline that examines the property of maintaining invariance even when a figure is continuously deformed. Through this, we learn how to see what is invariant, that is, what captures the essence.					
Style	Course method : Classes will be centered on board writing, but at the same time, as much exercise time as possible will be provided so that students can understand the content of the lecture more deeply and acquire the ability to solve problems on their own. Grade evaluation method : Evaluate by regular examination (60%) and report (40%). Depending on the grades, etc., a re-examination may be conducted (report assignment is imposed).					
Notice	Precautions on the enrollment : This is a class that requires study outside of class hours. A total of 45 hours of study is required per credit, including both class time and study outside class time. Follow the instructions of the instructor regarding study outside of class hours. Course advice : • As a preparatory study to be conducted in advance, review the contents of basic mathematics I, basic mathematics II, calculus I, calculus II, and basic linear algebra, which are the basic subjects. • It is important to make sure to prepare and review, and to understand the lecture contents more deeply by solving the exercises on your own. Foundational subjects : Basic Mathematics I (1st year), Basic Mathematics II (1), Calculus I (2), Calculus II (3), Basic Linear Algebra (2) Related subjects : Subjects of each specialized department Attendance advice : It is important to understand the content of the lecture well and solve the problem by yourself. I want you to value finding a solution on your own. If you are late a lot, you may be treated as absent after giving a warning.					

Characteristics of Class / Division in Learning							
<input type="checkbox"/> Active Learning		<input type="checkbox"/> Aided by ICT		<input type="checkbox"/> Applicable to Remote Class			
<input type="checkbox"/> Instructor Professionally Experienced							
E l e c t i v e   s u b j e c t s							
Course Plan							
			Theme	Goals			
1st Semester	1st Quarter	1st	Guidance, Euclidean geometry  Learning content outside class hours: Report assignment (1) "Euclidean geometry and topology"	Understand congruence transformation and become familiar with the properties of invariant figures under congruence transformation.			
		2nd	Similar geometry  Learning content outside class hours: Report assignment (1) "Euclidean geometry and topology"	Understand similarity transformations and become familiar with the properties of invariant figures under similarity transformations.			
		3rd	topology  Learning content outside class hours: Report assignment (1) "Euclidean geometry and topology"	Familiarize yourself with the idea of topology.			
		4th	Isometric transformation and joint transformation  Learning content outside class hours: Report assignment (1) "Euclidean geometry and topology"	Understand the relationship between isometric transformation and joint transformation.			
		5th	Exercise (Euclidean geometry and topology)  Learning content outside class hours: Report assignment (1) "Euclidean geometry and topology"				
		6th	Distance and Euclidean space  Learning content outside class hours: Report assignment (2) "Euclidean space and its figures"	Familiarize yourself with distance and Euclidean space.			
		7th	Shape  Learning content outside class hours: Report assignment (2) "Euclidean space and its figures"	Familiarize yourself with some examples of shapes in Euclidean space.			
		8th	Crafting figures, graphs, and self-similar figures  Learning content outside class hours: Report assignment (2) "Euclidean space and its figures"	Familiarize yourself with figure work, graphs, and self-similar figures.			
	2nd Quarter	9th	Set and logic  Learning content outside class hours: Report assignment (2) "Euclidean space and its figures"	Familiarize yourself with sets and logic.			
		10th	Exercise (Euclidean space and its figures)  Learning content outside class hours: Report assignment (2) "Euclidean space and its figures"				
		11th	Shape transformation  Learning content outside class hours: Report assignment (3) "Transformation and mapping of figures"	Understand the basic properties of figure deformation and represent the deformation by mapping.			
		12th	Map  Learning content outside class hours: Report assignment (3) "Transformation and mapping of figures"	Familiarize yourself with the nature of mapping.			
		13th	Sequences and point sequences of figures  Learning content outside class hours: Report assignment (3) "Transformation and mapping of figures"	Understand the sequence of numbers and the sequence of points of figures, and show convergence by the $\epsilon$ -N theory.			
		14th	Exercise (transformation and mapping of figures)  Learning content outside class hours: Report assignment (3) "Transformation and mapping of figures"				
		15th	(final exam)				
		16th	Return and commentary of the final exam answer				
Evaluation Method and Weight (%)							
	Examination	Presentation	Mutual Evaluations between students	Behavior	Portfolio	Other	Total
Subtotal	60	0	0	0	0	40	100
Basic Proficiency	0	0	0	0	0	0	0
Specialized Proficiency	60	0	0	0	0	40	100
Cross Area Proficiency	0	0	0	0	0	0	0

Tsuyama College		Year	2021		Course Title	Scientific Investigation
Course Information						
Course Code	0030		Course Category	Specialized / Elective		
Class Format	Lecture		Credits	Academic Credit: 2		
Department	Advanced Mechanical and Control System Engineering Course		Student Grade	Adv. 2nd		
Term	Second Semester		Classes per Week	2		
Textbook and/or Teaching Materials	Handouts and other materials will be distributed as appropriate.					
Instructor	YAMAGUCHI Daizo					
Course Objectives						
Learning purposes : When selecting a machine material, it is important to fully understand its properties and to judge how it should be used. In this class we will learn how to evaluate the properties of mechanical materials, and in group work we will learn what the results mean and what we need to pay attention to when evaluating them.						
Course Objectives : 1. To understand the methods of investigating the properties of mechanical materials and to be able to select the required evaluation method. 2. To be able to judge which materials are most suitable for the required performance. 3. To be able to draw up an evaluation and analysis plan.						
Rubric						
	Excellent	Good	Acceptable	Not acceptable		
Achievement 1	Be able to explain how to investigate the properties of materials and select the required evaluation methods.	Understand how to investigate the properties of materials and be able to work collaboratively in a team to select the required evaluation method.	Understand how to investigate the properties of materials with the advice of a supervisor and be able to select the necessary evaluation methods.	Not reached the left column.		
Achievement 2	It is possible to determine which materials are most suitable for the required performance.	The ability to work as a team to determine which materials are most suitable for the required performance.	With the advice of a supervisor, be able to judge what materials are most suitable for the required performance.	Not reached the left column.		
Achievement 3	Be able to develop an evaluation and analysis plan.	Be able to work in a team to develop a collaborative evaluation and analysis plan.	Be able to develop an evaluation and analysis plan with the advice of a supervisor.	Not reached the left column.		
Assigned Department Objectives						
Teaching Method						
Outline	General or Specialized : Specialized Field of learning : Common and basic natural sciences Foundational academic disciplines : Engineering / Materials / Mechanics of materials / Materials evaluation Relationship with Educational Objectives : This class is equivalent to "(2) Acquire basic science and technical knowledge". Relationship with JABEE programs : The main goals of learning / education in this class are "(A), A-1. Course outline : When selecting a machine material, it is important to fully understand its properties and to judge how it should be used. In this course, students will learn how to evaluate the properties of mechanical materials, and in group work, they will learn what the evaluation results mean and what to pay attention to when evaluating them.					
Style	Course method : Each group will research, study and make a presentation on the evaluation, analysis equipment and research field. The teacher will assist the students in their presentations and they will submit a report by the next week. Students are expected to prepare for the next lesson and understand the meaning of technical terms. Grade evaluation method : (1) Distribution of marks: examination (report method): 80%, presentation content: 20%. (2) Evaluation criteria: The basic content and understanding of the items listed in the achievement objectives and their basic application will be the evaluation criteria. 60 points or more is a passing score. (3) Re-examination: Students will be re-examined only once by oral examination. (3) Retest: Only one retest by oral examination will be given; however, a retest may be given if the subject in question does not meet the standard. A special report may also be substituted.					

Notice	<p>Precautions on the enrollment : In addition to the 15 credit hours per credit, students are required to study 30 credit hours. Students are expected to follow the instructions of their teachers regarding these studies.</p> <p>Course advice : It is essential that students prepare for the class by communicating and reviewing with their teammates, and that they maintain a regular interest in mechanical materials.</p> <p>Foundational subjects : Applied Chemistry (all 4th year), Chemistry II (3rd), Materials Science (M 2nd), Mechanics of Materials I (M 3rd), Mechanics of Materials II (M 4th), Electrical and Electronic Materials (E 5th).</p> <p>Related subjects : Functional Materials Science (MS 2nd), Strength of Materials (MS 2nd).</p> <p>Attendance advice : No previous learning of analytical instruments in the sciences is necessary, but students should be curious and actively seek to acquire new knowledge. Students are expected to study independently so that they can understand the basic purposes and principles of analytical instruments. Students who enter the room more than 15 minutes after the start of the class will be treated as absent.</p>
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#### Characteristics of Class / Division in Learning

<input checked="" type="checkbox"/> Active Learning	<input checked="" type="checkbox"/> Aided by ICT	<input checked="" type="checkbox"/> Applicable to Remote Class	<input checked="" type="checkbox"/> Instructor Professionally Experienced
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#### E l e c t i v e s u b j e c t s

#### Course Plan

			Theme	Goals
2nd Semester	3rd Quarter	1st	Guidance (Study outside class time: Assignment (1) Materials assessment methods (overview of different methods))	Understand how the class is run.
		2nd	Mechanical characterisation (tensile, compression, bending, hardness and impact tests) (Study outside class time: Assignment (2) Tensile and compression tests).	Understand typical mechanical properties evaluation methods.
		3rd	Preparation of Presentation Slides I (Study outside class time: Assignment (3) Bending Examination)	Work in groups to produce a slide about the evaluation device.
		4th	Preparation of presentation slides II (Study outside class time: Assignment (4) Hardness test)	Students work in groups to prepare slides on phenomena and theories.
		5th	Preparation of presentation slides III (Study outside class time: Assignment (5) on the impact test)	Each group will prepare a slide presentation on an application in a real company.
		6th	Presentation by group 1 (Study outside class time: preparation of assignment (6) by group 1)	Be able to understand the content of the presentation.
		7th	Presentation group 2 (Study outside class time: assignment (7) preparation of group 2)	Be able to understand the content of the presentation.
		8th	Presentation by 3 groups (Study outside class time: Assignment (8) Preparation of 3 groups)	Be able to understand the content of the presentation.
	4th Quarter	9th	Evaluation of mechanical materials (XRD, SEM, TEM) (Study outside class time: Assignment (9) XRD)	Be able to understand typical mechanical material evaluation methods.
		10th	Preparation of presentation slides I (Study outside class time: Assignment (10) SEM)	Work in groups to produce slides about the analyser.
		11th	Preparation of presentation slides II (Study outside class time: Assignment (11) TEM)	In groups, prepare a slide presentation on the principles of evaluation and analysis.
		12th	Presentation by group 1 (Study outside class time: preparation of assignment (12) by group 1)	Be able to understand the content of the presentation.
		13th	Presentation group 2 (Study outside class time: preparation of assignment (13) group 2)	Be able to understand the content of the presentation.
		14th	Presentation by group 3 (study outside class time: assignment (14) preparation by group 3)	Be able to understand the content of the presentation.
		15th	Completing the report	Correct inadequate report content.
		16th	Summary	

#### Evaluation Method and Weight (%)

	Examination (Report)	Presentation	Mutual Evaluations between students	Behavior	Portfolio	Other	Total
Subtotal	80	20	0	0	0	0	100
Basic Proficiency	0	0	0	0	0	0	0
Specialized Proficiency	80	20	0	0	0	0	100
Cross Area Proficiency	0	0	0	0	0	0	0

Tsuyama College		Year	2021		Course Title	System Control Engineering
Course Information						
Course Code		0031		Course Category	Specialized / Elective	
Class Format		Lecture		Credits	Academic Credit: 2	
Department		Advanced Mechanical and Control System Engineering Course		Student Grade	Adv. 2nd	
Term		Second Semester		Classes per Week	2	
Textbook and/or Teaching Materials		テキストとなる資料を配布する。				
Instructor		YAGI Hideyuki				
Course Objectives						
学習目的：伝達関数で表現されたシステムに対して時間領域で表現された状態空間モデルについて説明でき、システムの可制御性と可観測性の概念を理解する。						
到達目標： 1.実在システムから状態変数モデルが構築できる。 2.状態方程式の解法を知り、解を求めることができる。 3.可制御、可観測について理解し、系の可制御、可観測性が判定できる。 4.状態フィードバックによって系の極を指定できる。						
Rubric						
	優		良		可	不可
評価項目1	複雑な問題に対し状態空間モデルの理論を適用することができる。		状態空間モデルに関する理論を理解できる。		状態空間モデルに関する基礎的な理論を理解できる。	左記に達していない。
評価項目2	状態方程式の座標変換に関して発展的に理論を適用できる。		状態方程式の座標変換を理解できる。		状態方程式の基礎的な座標変換を理解できる。	左記に達していない。
評価項目3	システムの可制御性と可観測性の概念に関して発展的に理論を適用できる。		システムの可制御性と可観測性の概念に関する理論を理解できる。		システムの可制御性と可観測性の概念に関する基礎的な理論を理解できる。	左記に達していない。
評価項目4	応用的な問題に対し、状態フィードバックによる制御系設計理論を適用できる。		状態フィードバックによる制御系設計について理解できる。		状態フィードバックによる基礎的な制御系設計について理解できる。	左記に達していない。
Assigned Department Objectives						
Teaching Method						
Outline	一般・専門の別：専門・情報・制御					
	基礎となる学問分野：工学/電気電子工学/制御工学					
	専攻科学学習目標との関連：本科目は専攻科学学習目標「(2)専門技術分野の知識を修得し、機械やシステムの設計・製作・運用に活用できる能力を身につける」に相当する科目である。					
	技術者教育プログラムとの関連：本科目が主体とする学習・教育到達目標は「(A)技術に関する基礎知識の深化、A-1：工学に関する基礎知識として、自然科学の幅広い分野の知識を修得し、説明できること」である。					
Style	授業の概要：本講義では、モデル化されたシステムを現代制御理論により解析する。これらシステムの安定論、可制御・可観測性、構造解析など状態方程式を基に統一的に論ずる。					
	授業の方法：複雑なシステムのモデル化から制御設計手法まで、「倒立2輪車両ロボット」の制御モデル例を交えながら講義する。更に、理解が深まるように、レポート課題を課す。					
	成績評価方法：定期試験の結果を評価する（70％）。レポート課題などの提出物の内容を評価する（30％）。レポート課題の提出期限が守られていない場合は、最大20％までの評価とする。					
	理解度が不十分であると感じられる部分は補講を行い、再試を行う場合もある。再試の結果は上限60点として定期試験結果に入れる。					
Notice	履修上の注意：本科目は「授業時間外の学修を必要とする科目」である。当該授業時間と授業時間外の学修を合わせて、1単位あたり45時間の学修が必要である。授業時間外の学修については、担当教員の指示に従うこと。					
	履修のアドバイス：本科制御工学で学んだ内容を理解していることが望ましい。					
	基礎科目：制御工学（電気電子、情報4）、制御工学特論（電気電子5）など					
	関連科目：線形代数学（専1年）、回路網解析（専2）など					
	受講上のアドバイス：本講義では線形代数の知識を駆使することになる。行列演算等はコンピュータを用いて効率的に計算できるが、基本的な計算はハンドワークによって確認する必要がある。また、与えられる課題を遅延なくこなすことも重要である。					
	授業の開始時に出欠をとり、その際返事がなく、その後入室をしてきた者は遅刻とする。遅刻3回で1回の欠席とする。					
Characteristics of Class / Division in Learning						
<input type="checkbox"/> Active Learning		<input type="checkbox"/> Aided by ICT		<input type="checkbox"/> Applicable to Remote Class		<input type="checkbox"/> Instructor Professionally Experienced
選択						
Course Plan						
			Theme		Goals	
2nd Semester	3rd Quarter	1st	・ガイダンス		倒立2輪車両の安定化実例	
		2nd	・動的システムと状態方程式		状態方程式の計算	
		3rd	・システムモデルと線形化（1）		電気回路のモデル化	
		4th	・システムモデルと線形化（2）		タンクシステムのモデル化	



		5th	・システムモデルと線形化（３）	倒立２輪車両のモデル化
		6th	・システムモデルと線形化（４）	倒立２輪車両のモデル化
		7th	・状態方程式の解とその解法	状態方程式の微分方程式の解の計算
		8th	・可制御性，可観測性と判定法	可制御性，可観測性の解法
	4th Quarter	9th	・システムの座標変換（１）	可制御正準形式への変換
		10th	・システムの座標変換（２）	可観測正準形式への変換
		11th	・線形システムの構造解析	最小実現を求める
		12th	・システムの安定性とその判別	安定性を求める
		13th	・状態フィードバックによる極指定	コントローラを設計する
		14th	・出力フィードバックによる極指定	コントローラを設計する
		15th	期末試験	
		16th	・答案の返却と解説	

#### Evaluation Method and Weight (%)

	試験	発表	相互評価	自己評価	課題	小テスト	Total
Subtotal	70	0	0	0	30	0	100
基礎的能力	0	0	0	0	0	0	0
専門的能力	70	0	0	0	30	0	100
分野横断的能力	0	0	0	0	0	0	0

Tsuyama College		Year	2021		Course Title	Fluid Mechanics
Course Information						
Course Code	0032		Course Category	Specialized / Elective		
Class Format	Lecture		Credits	Academic Credit: 2		
Department	Advanced Mechanical and Control System Engineering Course		Student Grade	Adv. 2nd		
Term	First Semester		Classes per Week	2		
Textbook and/or Teaching Materials	Textbook : T. Kambe & K. Ishii, "Fluid Dynamics" (Shokabo).					
Instructor	SAEKI Fumihiro					
Course Objectives						
Learning purposes : Acquire the basic ability to theoretically analyze various problems and phenomena related to fluid dynamics.						
Course Objectives : 1. To understand the basic equations for the motion of perfect fluids, and analyze typical flow problems. 2. To understand the basic equations for the motion of compressible fluids, and analyze typical flow problems. 3. To understand the basic equations for the motion of viscous fluids, analyze typical flow problems.						
Rubric						
	Ideal Level	Standard Level	Acceptable Level	Unacceptable Level		
Achievement 1	Analyze typical flow problems related to perfect fluids, and explain the equations and solutions from a physical point of view.	Explain the basic equations for the motion of perfect fluids, and analyze typical flow problems.	Explain the basic equations of motion of perfect fluids.	Has not reached the level described in the columns on the left.		
Achievement 2	Analyze typical flow problems related to compressible fluids, and explain the equations and solutions from a physical point of view.	Explain the basic equations for the motion of compressible fluids, and analyze typical flow problems.	Explain the basic equations of motion of compressible fluids.	Has not reached the level described in the columns on the left.		
Achievement 3	Analyze typical flow problems related to viscous fluids, and explain the equations and solutions from a physical point of view.	Explain the basic equations for the motion of viscous fluids, and analyze typical flow problems.	Explain the basic equations of motion of viscous fluids.	Has not reached the level described in the columns on the left.		
Assigned Department Objectives						
Teaching Method						
Outline	Relationship to practice : In this course, a teacher, who has been engaged in the measurement of exhaust gas from combustion facilities and hot spring water power generation demonstration project, etc., teaches in the form of a lecture on energy transfer and gas state change, drawing on their experience.  General or Specialized : Specialized Field of learning : Energy and Flow Foundational academic disciplines : Mechanical engineering/Fluid engineering  Relationship with Educational Objectives : This class is equivalent to "(2) Acquire knowledge of specialized technical fields including materials and structure, motion and vibration, energy and flow, information and measurement/control, design and production/management, and machinery and systems, and acquire the ability to apply this knowledge to mechanical and system design, manufacture, and operations".  Relationship with JABEE programs : The main goal of learning / education in this class is "(A), A-2".  Course outline : In Fluid Engineering, which students have already studied, explanations were given from a hydraulic approach in order to understand the physical meaning of phenomena. In contrast, in this course, basic equations for fluid motion are derived and typical flows are explained from the hydrodynamic approach.					
Style	Course method : The class will be taught mainly on the board or by slides, with explanations of basic concepts and derivation of equations. Exercises and reports will be assigned as necessary to deepen understanding.  Grade evaluation method : Exams (70%) + Exercises and reports (30%). Students may be allowed to bring their own notebooks, calculators, etc. to the exam. Students whose grades are below 60 points may be required to take a retest, where the grade is re-evaluated up to 60 points by using the average of the regular and retest scores.					

Notice	Precautions on the enrollment : This is a class that requires study outside of class hours. A total of 45 hours of study is required per credit, including both class time and study outside class time. Follow the instructions of the instructor regarding study outside of class hours.
	Course advice : Since knowledge of mathematics (differential equations, vector analysis, complex functions, etc.) is required as prior knowledge, students are required to review these basics as preparatory studies.
	Foundational subjects : Linear Mathematics (3rd year), Applied Mathematics II (4th), Fluid Engineering (4th), Thermodynamics (4th), Highly Advanced Mathematics (5th), Energy System Engineering (Adv. 1st), etc. Related subjects : Computational Mechanics (Adv. 2nd year), etc.
	Attendance advice : In order to deepen understanding, take the initiative in doing exercises and reports, and review the foundational subjects as necessary. Arriving (leaving) more than 20 minutes late (early) result in one absence, and arriving (leaving) more than 65 minutes late (early) result in two absences.

### Characteristics of Class / Division in Learning

<input type="checkbox"/> Active Learning	<input type="checkbox"/> Aided by ICT	<input checked="" type="checkbox"/> Applicable to Remote Class	<input checked="" type="checkbox"/> Instructor Professionally Experienced
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### E l e c t i v e s u b j e c t s

### Course Plan

			Theme	Goals
1st Semester	1st Quarter	1st	Guidance Fundamentals of fluid motion (description of motion, deformational motion, rotational motion) Homework related to fluid motion	Understand the basics of describing fluid motion, and express deformational and rotational motions mathematically.
		2nd	Properties of fluids (volume and area forces, stress, Newtonian and perfect fluids)	Explain the forces acting on fluids, and classify fluids.
		3rd	Basic equation 1 (conservation of mass, conservation of momentum) Homework related to the equation of continuity and the equation of motion	Explain the derivation of the equation of continuity and the equation of motion.
		4th	Basic equations 2 (vorticity equation, conservation of energy) Homework related to vorticity and energy equations	Explain the derivation of the vorticity and energy equations.
		5th	Motion of a perfect fluids 1 (Fundamental theorem of potential flow)	Explain the fundamental theorem of potential flow.
		6th	Motion of perfect fluids 2 (various potential flows) Homework related to potential flows	Obtain solutions for various potential flows.
		7th	Incompressible and irrotational flow in two dimensions 1 (stream function, complex velocity potential)	Explain the stream function and complex velocity potential.
		8th	Incompressible and irrotational flow in two dimensions 2 (example of flow field)	Obtain solutions for a typical two-dimensional incompressible and irrotational flow.
	2nd Quarter	9th	Incompressible and irrotational flow in two dimensions 3 (conformal transformation, Joukowski transformation, forces acting on objects) Homework related to incompressible and irrotational flow	Explain conformal transformation, Joukowski transformation, and forces acting on objects.
		10th	Compressible fluid 1 (sound waves)	Derive the wave equation from the basic equations of compressible fluid, and explain the solution of the wave equation.
		11th	Compressible fluid 1 (shock waves) Homework related to the Rankine-Hugoniot relations	Explain shock waves, and derive the Rankine-Hugoniot relations.
		12th	Viscous Fluid Flow 1 (basic equations and boundary conditions, similarity law) Homework related to similarity laws	Explain the basic equations and boundary conditions of viscous fluids. Explain the physical meaning of the similarity law and the classification of flows.
		13th	Viscous fluid flow 2 (parallel flow, low Reynolds number flow) Homework related to parallel flow	Obtain solutions for typical parallel flows. Explain the equation of low Reynolds number flow.
		14th	Viscous fluid flow 3 (high Reynolds number flow)	Explain the high Reynolds flow equation and boundary layer.
		15th	(1st semester final exam)	
		16th	Return and commentary of exam answers	

### Evaluation Method and Weight (%)

	Examination	Exercises and reports	Total
Subtotal	70	30	100
Basic Proficiency	0	0	0
Specialized Proficiency	70	30	100
Cross Area Proficiency	0	0	0

Tsuyama College		Year	2021	Course Title	Applied Control Engineering
Course Information					
Course Code	0033		Course Category	Specialized / Elective	
Class Format	Lecture		Credits	Academic Credit: 2	
Department	Advanced Mechanical and Control System Engineering Course		Student Grade	Adv. 2nd	
Term	Second Semester		Classes per Week	2	
Textbook and/or Teaching Materials					
Instructor	TAKETANI Hisashi				
Course Objectives					
<p>Learning purposes : Control understands various control methods and keeps the ability by which they can grope after appropriate solution method in technological miscellaneous problems.</p> <p>Course Objectives :  1. It can be explained about a summary of a neural network, a learning method and movement.  2. It can be explained about a summary of Fuzzy theory.  3. It can be explained about a summary of Genetic Algorithm.</p>					
Rubric					
	Excellent	Good	Acceptable	Not acceptable	
Achievement 1	The student can grasp the feature about various neural networks and apply technologically.	The student can explain specifically about a learning law of a neural network and behavior.	The student can explain the outline about a learning law of a neural network and behavior.	The student dose not reach the following.	
Achievement 2	The student can understand the feature of the Fuzzy theory and apply technologically about an easy example.	The student can explain specifically about the contents of Fuzzy theory.	The student can explain the outline about the contents of Fuzzy theory.	The student dose not reach the following.	
Achievement 3	The student can apply Genetic Algorithm technologically.	The student can explain specifically about the contents of Genetic Algorithm.	The student can explain the outline about the contents of Genetic Algorithm.	The student dose not reach the following.	
Assigned Department Objectives					
Teaching Method					
Outline	<p>General or Specialized : Specialized Field of learning : Information, measurement and control Foundational academic disciplines : Engineering/electric electronics and mechanical engineering</p> <p>Relationship with Educational Objectives : This class is equivalent to "(2) Knowledge of specialized field technology is acquired and the ability which can be utilized for a design of a machine and a system, a policy and practical use is learned".</p> <p>Relationship with JABEE programs : The main goal of learning / education in this class is "(A) and (A-2)", also "(A-1)" is involved.</p> <p>Course outline : Control theory as well as development of a computer advance rapidly and diversify. The summary is introduced about the neural network fuzzy theory "and" the genetic algorithm which have become close by electrical appliances recently here.</p>				
Style	<p>Course method : I print writing on the blackboard in the center and lecture on a summary of general theory and a recent topic using a simulation by a PC.</p> <p>Grade evaluation method : Periodic test (70%); A report practice (30%) test can bring writing implements, a calculator and a textbook, etc. in. A make-up isn't put into effect as a principle.</p>				
Notice	<p>Precautions on the enrollment : This class is "subject which requires learning in schooltime outside". Learning for 45 hours is needed per a semester hour together with learning outside the schooltime concerned and the schooltime. Follow directions of a teacher in charge about learning in schooltime outside.</p> <p>Course advice :  1. Review the contents of several science and engineering, the computational dynamics and the system control engineering which become a basic subject as the learning of preparations performed beforehand.  2. The former control method is a control method of a new concept which is completely different, but the knowledge of control engineering and information engineering is also needed.</p> <p>Foundational subjects : Several science and engineering , computational dynamics and system control engineering etc.</p> <p>Attendance advice : The center of these control is software, but large-scale software doesn't make, does easy numerical value calculation and makes it help of understanding here. Therefore always carry calculators. When it's entrance within 20 minutes from class starting, it's made lateness and 1 deficit is done with the department by 3 times of lateness.</p>				
Characteristics of Class / Division in Learning					
<input type="checkbox"/> Active Learning		<input type="checkbox"/> Aided by ICT		<input type="checkbox"/> Applicable to Remote Class	
				<input type="checkbox"/> Instructor Professionally Experienced	

Course Plan							
			Theme	Goals			
2nd Semester r	3rd Quarter	1st	Guidance and outline	The course contents are understood.			
		2nd	Information processing by a creature (1)	Information processing by a creature			
		3rd	Information processing by a creature (2)	Information processing by a creature			
		4th	Information processing by a creature (3)	Comparison of perishables and a computer			
		5th	The outline of an artificial neural network	An artificial neural network model			
		6th	Content address memory by a mutual online type neural network	The outline of content address memory			
		7th	Solution of combinatorial problem by a mutual online type neural network	The outline of combinatorial problem			
		8th	Multi-layer neural network	Behavior of a network and learning algorithm			
	4th Quarter	9th	Deep learning	Mechanism of a multiple network			
		10th	Self organizing map(SOM)	The outline of SOM			
		11th	Genetic Algorithm(GA) (1)	Basis of GA			
		12th	Genetic Algorithm(GA) (2)	Application of GA			
		13th	Fuzzy theory (1)	Basic of Fuzzy theory			
		14th	Fuzzy theory (2)	Application of Fuzzy theory			
		15th	(Periodic exam)				
		16th	Answer return and test explanation of a back final exam				
Evaluation Method and Weight (%)							
	Examination	Presentation	Mutual Evaluations between students	Behavior	Portfolio	Other	Total
Subtotal	70	0	0	0	30	0	100
Basic Proficiency	0	0	0	0	0	0	0
Specialized Proficiency	70	0	0	0	30	0	100
Cross Area Proficiency	0	0	0	0	0	0	0

Tsuyama College		Year	2021		Course Title	Computational Mechanics	
Course Information							
Course Code	0034		Course Category		Specialized / Elective		
Class Format	Lecture		Credits		Academic Credit: 2		
Department	Advanced Mechanical and Control System Engineering Course		Student Grade		Adv. 2nd		
Term	First Semester		Classes per Week		2		
Textbook and/or Teaching Materials							
Instructor	KOBAYASHI Toshiro						
Course Objectives							
Learning purposes : As an applied course of computer use, learn the main numerical analysis methods applied to specific science and engineering problems, and deepen understanding of computer applied mechanics analysis.							
Course Objectives : 1. Approximate formulas can be created using Taylor expansion. 2. The differential equations of the first and second orders can be differentiated. 3. Single-element and multi-element shape functions and stiffness matrix can be derived. 4. Understand the matrix solution method and be able to derive the equations for displacement and stress of multiple elements. 5. Understand the finite element method. 6. Using the general-purpose finite element method code, standard problems of 3D structure, heat transfer, and fluid can be analyzed without much deviation.							
Rubric							
	Excellent		Good		Acceptable		Not acceptable
Achievement 1	<ul style="list-style-type: none"><li>• The differential equations of the 1st and 2nd floors can be differentiated.</li><li>• Can program a simple difference formula to find a numerical solution.</li></ul>		<ul style="list-style-type: none"><li>• Approximate formulas can be created using Taylor expansion.</li><li>• The differential equations of the 1st and 2nd orders can be differentiated.</li></ul>		<ul style="list-style-type: none"><li>• A basic approximation can be created using Taylor expansion.</li><li>• Basic differentiation of first- and second-order differential equations is possible.</li></ul>		<ul style="list-style-type: none"><li>• Understand the basics of the finite element method.</li><li>• Using the general-purpose finite element method code, basic problems of 3D structure, heat transfer, and fluid can be analyzed without much deviation.</li></ul>
Achievement 2	<ul style="list-style-type: none"><li>• Using the matrix solution method, it is possible to analyze the displacement and stress of specific structural problems of multiple elements.</li></ul>		<ul style="list-style-type: none"><li>• It is possible to derive single-element and multi-element shape functions and stiffness matrices.</li><li>• Understand the matrix solution method and be able to derive the equations for displacement and stress of multiple elements.</li></ul>		<ul style="list-style-type: none"><li>• It is possible to derive single-element and multi-element shape functions and stiffness matrices.</li><li>• Understand the basic matrix solution method and be able to derive the displacement and stress equations of multiple elements.</li></ul>		<ul style="list-style-type: none"><li>• Single-element and multi-element shape functions and stiffness matrix cannot be derived.</li><li>• The exercise to calculate the displacement and stress using the matrix solution method cannot be completed by the deadline.</li></ul>
Achievement 3	<ul style="list-style-type: none"><li>• Using the general-purpose finite element method code, basic problems of 3D structure, heat transfer, and fluid can be analyzed without much deviation.</li><li>• In various analyzes using the finite element method, it can be considered in comparison with the theoretical solution so as not to deviate significantly.</li></ul>		<ul style="list-style-type: none"><li>• Understand the finite element method.</li><li>• Using the general-purpose finite element method code, standard problems of 3D structure, heat transfer, and fluid can be analyzed without much deviation.</li></ul>		<ul style="list-style-type: none"><li>• Understand the basics of the finite element method.</li><li>• Using the general-purpose finite element method code, basic problems of 3D structure, heat transfer, and fluid can be analyzed without much deviation.</li></ul>		<ul style="list-style-type: none"><li>• Not understand the finite element method.</li><li>• Using the general-purpose finite element method code, it is not possible to analyze basic problems of 3D structure, heat transfer, and fluid without major deviation.</li><li>• Exercises cannot be completed by the deadline.</li></ul>
Assigned Department Objectives							
Teaching Method							

Outline	<p>* Relationship with business: In this subject, faculty member who has practical experience in digital engineering in research and development work at heavy industry manufacturers will use his experience to teach basic and practical dynamic simulations such as numerical analysis, finite difference method, and finite element method.</p> <p>General or Specialized : Specialized</p> <p>Field of learning : Design and production / management</p> <p>Foundational academic disciplines : Engineering / Mechanical Engineering</p> <p>Relationship with Educational Objectives in advanced course : This subject corresponds to "(2) Acquire knowledge of specialized fields such as materials and structure, motion and vibration, energy and flow, information and measurement / control, design and production / management, machines and systems, and design / policy of machines and systems. Acquire the ability to utilize for operation ", which is one of the learning goals of the advanced course.</p> <p>Relationship with JABEE programs : The main goals of this subject are "(A) Deepening of basic knowledge about technology, A-2" Materials and structure ", " Movement and vibration ", " Energy and flow ", " Information and measurement / control " . , "Design and production," "machines and systems," and "being able to acquire and explain knowledge in specialized technical fields," and also involved in "A-1."</p> <p>Course outline : With the development of electronic computers, the precision and speed of technical calculations have progressed, and numerical experiments have become an important field of engineering methods. We will explain and practice methods for expressing natural phenomena as mathematical models and analyzing them with a computer.</p>
Style	<p>Course method : The lessons will be centered on board writing. Presenting a concrete mechanical model will be tried. Reports will be imposed to deepen student's understanding of the basic principles of computational mechanics.</p> <p>Grade evaluation method : Evaluate by regular examination (70%) and report (30%). Retest in some cases. The retest will be evaluated in the same way as the main test.</p>
Notice	<p>Precautions on the enrollment : This is a class that requires study outside of class hours. A total of 45 hours of study is required per credit, including both class time and study outside class time. Follow the instructions of the instructor regarding study outside of class hours.</p> <p>Course advice : It is desirable to fully understand what you have learned in information processing I, II and numerical analysis. As a preparatory study to be performed in advance, it is necessary to be able to use 3D-CAD in order to create a 3D model in the CAE exercise.</p> <p>Foundational subjects : Applied mechanical design (5th year), design engineering (5th), applied design engineering (2nd in advanced course), information science (1st in advanced course), etc.</p> <p>Related subjects : Design Engineering (5th year), CAD / CAM (5th), Applied Design Engineering (1st in advanced course),</p> <p>Attendance advice : High-performance, inexpensive, and easy-to-use PCs and operating systems have become widespread, and various general-purpose computational mechanics software can be easily used, and the user base of computational mechanics is rapidly expanding. It is important to be able to correctly set analysis problems for basic computational mechanics problems, understand the contents of CAE analysis, and verify the reliability of analysis results by yourself. Students would be recommended to acquire the theory and skills with the aim of becoming a computational mechanic engineer certification test of the Japan Society of Mechanical Engineers. If you are not seated at the beginning of the class, you will be late.</p>

#### Characteristics of Class / Division in Learning

<input type="checkbox"/> Active Learning	<input checked="" type="checkbox"/> Aided by ICT	<input checked="" type="checkbox"/> Applicable to Remote Class	<input type="checkbox"/> Instructor Professionally Experienced
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#### E l e c t i v e s u b j e c t s

#### Course Plan

		Theme	Goals
1st Semester	1st Quarter	1st ● Guidance	Explain what computational mechanics is.
		2nd ● The basics of mathematics for computational mechanics	Understand mathematics for computational mechanics.
		3rd Basics of heat conduction and solid-state mechanics Report assignment (1) 3D-CAD	Understanding the basics of heat conduction and solid-state mechanics, a difference equation is required.
		4th ● Basics of the finite element method I	Explain the principle of the finite element method.
		5th ● Basics of the finite element method II	Basic analysis using the finite element method is possible.
		6th ● CAE Exercise (1) Stress Strain Analysis Report assignment (2) Numerical calculation method (1)	It can be confirmed that the basic analysis using the finite element method is valid.
		7th ● CAE Exercise (2) Heat Transfer Analysis	Basic heat transfer analysis using the finite element method is possible.
		8th ● Element selection	Understand the elements of the finite element method and explain their effects.
	2nd Quarter	9th ● Basics of modeling Report assignment (3) Numerical calculation method (2)	Understand the modeling method of the finite element method and explain its influence.

		10th	● Basics of how to use boundary conditions	Understand and apply the types of boundary conditions of the finite element method.
		11th	● Basics of pre-post processing	Understand and apply the prepost processing method of the finite element method.
		12th	● CAE exercise (3) Vibration analysis Report assignment (4) CAE exercise (1)	Basic vibration analysis using the finite element method is possible.
		13th	● CAE Exercise (4) Fluid Analysis	Can perform basic fluid analysis using the finite element method.
		14th	● Basics of result verification, ethics of computational mechanics engineers Report assignment (5) CAE exercise (2)	Understand the ethics of computational mechanics engineers.
		15th	(Final exam)	Attend and submit your answer.
		16th	● Returning answers for final exams and commentary on answers	Correct the wrong answer.

#### Evaluation Method and Weight (%)

	Examination	Presentation	Mutual Evaluations between students	Behavior	Portfolio	Other	Total
Subtotal	70	0	0	0	30	0	100
Basic Proficiency	0	0	0	0	0	0	0
Specialized Proficiency	70	0	0	0	30	0	100
Cross Area Proficiency	0	0	0	0	0	0	0



Tsuyama College		Year	2021	Course Title	Strength and Fracture of Materials
Course Information					
Course Code	0035		Course Category	Specialized / Elective	
Class Format	Lecture		Credits	Academic Credit: 2	
Department	Advanced Mechanical and Control System Engineering Course		Student Grade	Adv. 2nd	
Term	First Semester		Classes per Week	2	
Textbook and/or Teaching Materials	Textbooks :Textbooks are distributed.				
Instructor	SHIOTA Hirohisa				
Course Objectives					
Learning purposes : Understand the general formulation in continuum mechanics of materials, and understand the mechanisms of deformation and fracture that govern the strength of materials.					
Course Objectives : 1. To understand the formulation in elastic mechanics. 2. To understand the types and characteristics of deformation and fracture. 3. To understand the relationship between macroscopic deformation and fracture and microscopic organization and structure.					
Rubric					
	Excellent	Good	Acceptable	Not acceptable	
Achievement 1	To be able to understand and derive formulations in elastic mechanics accurately.	Understand the basic formulations in elastic mechanics.	Understand most of the basic formulations in elastic mechanics.	Not reached to the left.	
Achievement 2	Have an accurate understanding of the types and characteristics of various deformations and fractures.	Understand the basic types and characteristics of deformation and fracture.	Understand most of the basic types and characteristics of deformation and fracture.	Not reached to the left.	
Achievement 3	Accurate understanding of the relationship between macroscopic deformation and fracture and microscopic organization and structure.	Understand the basic relationship between macroscopic deformation and fracture and microscopic organization and structure.	Understand most of the basic relationships between macroscopic deformation and fracture and microscopic organization and structure.	Not reached to the left.	
Assigned Department Objectives					
Teaching Method					
Outline	General or Specialized : Specialized Field of learning : Materials and structures Foundational academic disciplines : Engineering/Mechanical engineering/Strength of materials				
	Relationship with Educational Objectives :This class is equivalent to "(2) Acquire basic science and technical knowledge".				
	Relationship with JABEE programs :The main goals of learning / education in this class are "(A) Deepening of basic knowledge of technology, A-2: "To be able to acquire and explain knowledge in the technical fields of "materials and structures", "motion and vibration", "energy and flow", "information, measurement and control", "design, production and management" and "machines and systems", also "A-1" is involved.				
Style	Course method : The class proceeds with the focus on the board, paying attention to the relationship with the basic subjects. Students will be instructed to do exercises and given reports as needed to deepen their understanding.				
	Grade evaluation method : Regular examination(70%). Simple tests, reports, etc. (30%).				
Notice	Precautions on the enrollment : This is a class that requires study outside of class hours. A total of 45 hours of study is required per credit, including both class time and study outside class time. Follow the instructions of the instructor regarding study outside of class hours.				
	Course advice : • As a preparatory study, review and understand the contents of mechanics and materials science. • Review the basic content of the subjects listed in the Basic Subjects column as necessary.				
	Foundational subjects : Materials Technology(2nd year), Strength of Materials I (3rd year), Strength of Materials II (4th year),  Related subjects : Design of Machine Elements I (3rd year), II (4th), Applied Machine Design(5th), Graduation Thesis(5th)  Attendance advice : There are many phenomena that occur around us that deform or destroy things, so paying attention to such phenomena on a daily basis, including newspaper articles and TV news, will help you understand the lesson. It is also a good idea to think about how forces are applied to structures such as vehicles and bridges when you see them. Students who enter the class after half of the class time will be counted as absent.				
Characteristics of Class / Division in Learning					
<input type="checkbox"/> Active Learning		<input type="checkbox"/> Aided by ICT		<input type="checkbox"/> Applicable to Remote Class	
				<input type="checkbox"/> Instructor Professionally Experienced	

E l e c t i v e   s u b j e c t s							
Course Plan							
			Theme	Goals			
1st Semester	1st Quarter	1st	Guidance				
		2nd	Stress (definition, composition)	Check the definition and formulation of the left			
		3rd	Coordinate transformation of stress components	Check the definition and formulation of the left			
		4th	Stress equilibrium equation and boundary conditions	Check the definition and formulation of the left			
		5th	Strain (definition, components)	Check the definition and formulation of the left			
		6th	Coordinate transformation of strain components, compatibility condition	Check the definition and formulation of the left			
		7th	Constitutive equation	Check the definition and formulation of the left			
		8th	Guidance (Strength of Materials)				
	2nd Quarter	9th	Stress and strain, laws of failure	Understanding of left phenomena and mechanical quantities			
		10th	Crack Mechanics	Understanding of left phenomena and mechanical quantities			
		11th	Tensile test, fracture characteristics	Understanding of left phenomena and mechanical quantities			
		12th	Fracture under Multiaxial Stress, Fracture Toughness	Understanding of left phenomena and mechanical quantities			
		13th	Fatigue fracture, deformation and fracture at high temperature	Understanding of left phenomena and mechanical quantities			
		14th	Environmental strength	Understanding of left phenomena and mechanical quantities			
		15th	(1st semester final exam)				
		16th	Return and commentary of exam answers				
Evaluation Method and Weight (%)							
	Examination	Presentation	Mutual Evaluations between students	Behavior	Portfolio	Other	Total
Subtotal	70	0	0	0	30	0	100
Basic Proficiency	0	0	0	0	0	0	0
Specialized Proficiency	70	0	0	0	30	0	100
Cross Area Proficiency	0	0	0	0	0	0	0

Tsuyama College		Year	2021		Course Title	Vibrational Engineering
Course Information						
Course Code	0036		Course Category	Specialized / Elective		
Class Format	Lecture		Credits	Academic Credit: 2		
Department	Advanced Mechanical and Control System Engineering Course		Student Grade	Adv. 2nd		
Term	First Semester		Classes per Week	2		
Textbook and/or Teaching Materials	Textbook:Osamu Taniguchi,"Revision of Vibrational Engineering"(Corona),Reference book:Timoshenko/Young/Weaver,"Industrial Vibration Science,New Edition"(Corona)					
Instructor	YAMAMOTO Yoshinori					
Course Objectives						
Learning purposes : Students will learn how to model a vibrating object, formulate equations of motion, and analyze them. In addition, students will further deepen their knowledge of mechanical mechanics.						
Course Objectives : 1. To be able to formulate and solve the equations of motion of a basic vibration model with one degree of freedom. 2. Understand and utilize the vibration phenomena and analysis methods of distributed constant vibration systems. 3. Understand specific vibration phenomena through assignment reports and be able to apply them to solve various problems. ◎ 4. To be able to communicate using effective explanation methods and means.						
Rubric						
	Excellent	Good	Acceptable	Not acceptable		
Achievement 1	To be able to formulate and solve equations of motion for various 1-DOF vibration models.	To be able to formulate and solve equations of motion for a basic 1-DOF vibration model.	The equations of motion for a basic 1-DOF vibration model can be established.	The contents of the left column have not been reached.		
Achievement 2	Understand and analyze the vibration phenomena of various distributed constant vibration systems.	Understand and analyze the vibration phenomena of basic distributed constant vibration systems.	Understand the vibration phenomena of basic distributed constant vibration systems.	The contents of the left column have not been reached.		
Achievement 3	Be able to understand specific vibration phenomena through assignment reports and apply them to solve various problems.	To be able to understand and analyze basic vibration phenomena through assignment reports.	Understand basic vibration phenomena through assignment reports.	The contents of the left column have not been reached.		
Assigned Department Objectives						
Teaching Method						
Outline	General or Specialized : Specialization Field of learning :Motion and Vibration Foundational academic disciplines : Engineering/mechanical engineering/mechanical mechanics and control					
	Relationship with Educational Objectives of Advanced Course : This class is equivalent to "(2) Acquire knowledge of specialized technologies such as material and structures,motion and vibration,energy and flow,information and measurment/control, design and production/magagement, and machines and systems, and acquire the ability to apply this knowledge to the design, policy, and operation of machines and systems".					
	Relationship with JABEE programs : The main goal of learning / education in this class is "(A)", also "(A-2)"is involved.					
	Course outline : The vibration of machinery and machine parts is an important issue in machine design because it causes problems such as mechanical strength and noise pollution. In this class, we will focus on the vibration of machines and their components and deal with the dynamic problems of machines.					
Style	Course method : The lecture will be conducted mainly on the board. Students will learn how to solve differential equations, force, velocity, acceleration and moment. We will pay attention to solve differential equations and to deepen students' understanding of Newtonian mechanics such as force, velocity, acceleration, and moment.					
	Grade evaluation method : Results of regular examinations are equally evaluated (70%). Quizzes, exercises and reports (30%). Students with an aggregate score of less than 60 points may be required to retake the examinations, which will be the same as the regular examinations. Students are allowed to bring their own notebooks and calculators to the exam. In the case of distance learning, the grading method may be changed.					

Notice	Precautions on the enrollment : This is a class that requires study outside of class hours. A total of 45 hours of study is required per credit, including both class time and study outside class time. Follow the instructions of the instructor regarding study outside of class hours.
	Course advice : It is important to understand mathematics and physics, since the main topics are the equation of physical phenomena and the solution of linear differential equations.
	Foundational subjects : Fundamental Differential Equations(3rd year), Mechanics I (3rd year), Mechanics II (3rd), Applied Mathematics II (4th year), Controlling Engineering (4th), etc. Related subjects : Computational Mechanics (MS- 2nd), System Control Engineering (MS- 2nd), etc.
	Attendance advice : The equations in this course are linear differential equations, since this course mainly deals with 1D problems including rotation. The equations are linear differential equations, so students are encouraged to review the solutions of differential equations. The physical interpretation is based on industrial mechanics, so students are encouraged to review this as well. Students are expected to submit the report by the due date, and will be expected to be late for the class.

### Characteristics of Class / Division in Learning

<input type="checkbox"/> Active Learning	<input type="checkbox"/> Aided by ICT	<input checked="" type="checkbox"/> Applicable to Remote Class	<input type="checkbox"/> Instructor Professionally Experienced
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### E l e c t i v e s u b j e c t s

#### Course Plan

			Theme	Goals
1st Semester	1st Quarter	1st	Guidance(including explanation of syllabus),undamped 1-DOF free vibration	Understand and be able to explain the items listed on the left
		2nd	1 degree of freedom free vibration damped	Understand and be able to explain the items listed on the left
		3rd	Forced vibration in the absence of damping	Understand and be able to explain the items listed on the left
		4th	Forced vibration in the presence of damping	Understand and be able to explain the items listed on the left
		5th	Transmission of vibration,forced vibration by displacement	Understand and be able to explain the items listed on the left
		6th	transient vibration	Understand and be able to explain the items listed on the left
		7th	Vibration of a two-degree-of-freedom system	Understand and be able to explain the items listed on the left
		8th	Coupled forced vibration	Understand and be able to explain the items listed on the left
	2nd Quarter	9th	self-excited ascillation	Understand and be able to explain the items listed on the left
		10th	self-excited oscillation and stability	Understand and be able to explain the items listed on the left
		11th	Vibration of strings,torsion and longitudinal vibration of rods	Understand and be able to explain the items listed on the left
		12th	Solition to the wave equation	Understand and be able to explain the items listed on the left
		13th	Free vibration solution for steady-state vibration with infinite degrees of freedom	Understand and be able to explain the items listed on the left
		14th	Bending vibration of a beam	Understand and be able to explain the items listed on the left
		15th	(Last semester final exam)	
		16th	Return of answers and explanations	

### Evaluation Method and Weight (%)

	Examination	Presentation	Mutual Evaluations between students	Behavior	Portfolio	Other	Total
Subtotal	70	0	0	0	30	0	100
Basic Proficiency	0	0	0	0	0	0	0
Specialized Proficiency	70	0	0	0	30	0	100
Cross Area Proficiency	0	0	0	0	0	0	0

Tsuyama College		Year	2021		Course Title	Electric Energy Engineering
Course Information						
Course Code	0037		Course Category	Specialized / Elective		
Class Format	Seminar		Credits	Academic Credit: 2		
Department	Advanced Mechanical and Control System Engineering Course		Student Grade	Adv. 2nd		
Term	Second Semester		Classes per Week	2		
Textbook and/or Teaching Materials	Textbook: Denki Energy Gairon (Ohm sha), Reference book: Hatsuhenden-kogaku-soron (Denki Gakkai)					
Instructor	OKE Shinichiro					
Course Objectives						
Learning purposes : To understand the supply, demand, and conversion of electrical energy, which forms the basis of modern society, in order to use and apply the knowledge and skills learned in the major course in companies and graduate schools.						
Course Objectives : 1. To be able to explain the overview and problems of energy supply and demand in Japan and the world. 2. To be able to explain the energy supply and use of hydro, thermal, nuclear, and renewable energy sources. 3. To be able to perform basic calculations on various types of electrical energy. 4. To be able to organize their research and explain it in an easily understood style.						
Rubric						
	Excellent	Good	Acceptable	Not acceptable		
Achievement 1	Students can explain the overview and problems of energy supply and demand in Japan and the world.	Students can explain the basics of energy supply and demand in Japan and the world.	The student can explain some basic information about energy supply and demand in Japan and the world.	The student cannot explain the overview and problems of energy supply and demand in Japan and the world.		
Achievement 2	Students can explain the energy supply and use of hydro, thermal, nuclear, and renewable energy sources.	Students can explain the basics of energy supply and use of hydro, thermal, nuclear, and renewable energy sources.	Students can explain some basics of energy supply and use of hydro, thermal, nuclear, and renewable energy sources.	Students cannot explain the energy supply and use of hydro, thermal, nuclear, and renewable energy sources.		
Achievement 3	Students can perform basic calculations on various types of electrical energy.	Students can perform some basic calculations on various types of electrical energy.	Students can perform basic and simple calculations on various types of electrical energy.	Students cannot perform basic calculations on various types of electrical energy.		
Achievement 4	Students can organize their research and explain it in an easily understood style.	Students can organize their research and explain it in a slightly easier way.	Students can organize and explain the content of their research.	Students cannot explain what they have researched.		
Assigned Department Objectives						
Teaching Method						
Outline	General or Specialized : Specialized Field of learning : Machine and system Foundational academic disciplines : Engineering / Nuclear engineering, earth resources engineering, energy engineering, and related fields / Earth resource engineering, Energy sciences-related Engineering / Electrical and electronic engineering and related fields / Power engineering-related Relationship with Educational Objectives : This class is equivalent to (2). Relationship with JABEE programs : The main goals of learning / education in this class are "(A) ..., A-2: ...", also "A-1". Course outline : In this course, students learn about the principles of electric energy generation from hydroelectric, thermal, nuclear, and renewable energies, as well as the current status and future issues of utilization technologies.					
Style	Course method : In this class, groups of students will research based on the textbook and make poster presentations. At the beginning of the class, the student's supervisor gives a keynote presentation. Grade evaluation method: Grades are given in the following proportions: poster presentation: 50%, report: 40%, keynote presentation: 10%.					
Notice	Precautions on the enrollment : This is a class that requires study outside of class hours. A total of 45 hours of study is required per credit, including both class time and study outside class time. Follow the instructions of the instructor regarding study outside of class hours. Course advice : Students need to learn and present according to the presentation assignment. Foundational subjects : Related subjects : Attendance advice :					
Characteristics of Class / Division in Learning						

<input checked="" type="checkbox"/> Active Learning		<input checked="" type="checkbox"/> Aided by ICT		<input checked="" type="checkbox"/> Applicable to Remote Class		<input type="checkbox"/> Instructor Professionally Experienced	
E l e c t i v e   s u b j e c t s							
Course Plan							
			Theme	Goals			
2nd Semester r	3rd Quarter	1st	Guidance	Be able to understand how to conduct the class.			
		2nd	World Energy Situation and Japan	Be able to explain the world energy situation and Japan.			
		3rd	Limited energy resources	Be able to explain limited energy resources			
		4th	Energy and Environment	Be able to explain energy and environment			
		5th	Mechanism of a generator	Be able to explain mechanism of a generator			
		6th	Thermodynamics and the Mechanism of Thermal Power Generation	Be able to explain thermodynamics and the mechanism of thermal power generation			
		7th	Writing an interim summary report				
		8th	Utilization of nuclear energy	Utilization of nuclear energy			
	4th Quarter	9th	Mechanisms of mechanical energy and hydropower generation	Be able to explain mechanisms of mechanical energy and hydropower generation			
		10th	Conversion of chemical energy to electrical energy	Be able to explain conversion of chemical energy to electrical energy			
		11th	Conversion of light to electrical energy	Be able to explain conversion of light to electrical energy			
		12th	Various power generation systems using renewable energy	Be able to explain various power generation systems using renewable energy			
		13th	Operation of power systems	Be able to explain operation of power systems			
		14th	Transmission of electrical energy	Be able to explain transmission of electrical energy			
		15th	(Writing the final summary report)				
		16th	Submission of final summary report				
Evaluation Method and Weight (%)							
	Examination	Presentation	Mutual Evaluations between students	Behavior	Reports	Other	Total
Subtotal	0	60	0	0	40	0	100
Basic Proficiency	0	0	0	0	0	0	0
Specialized Proficiency	0	0	0	0	40	0	40
Cross Area Proficiency	0	60	0	0	0	0	60

Tsuyama College		Year	2021	Course Title	Functional Materials
Course Information					
Course Code	0038		Course Category	Specialized / Elective	
Class Format	Lecture		Credits	Academic Credit: 2	
Department	Advanced Mechanical and Control System Engineering Course		Student Grade	Adv. 2nd	
Term	Second Semester		Classes per Week	2	
Textbook and/or Teaching Materials	Textbooks : The Perfect Guide to Functional Materials (Kodansha), Reference books : Tsuguro Ohara, "Introduction to Metallography" (Asakura Shoten), Masaharu Aoki, "Theory of Applied Physical Properties" (Asakura Shoten), Kinichi Kando, "Basic Knowledge of Functional Materials" (Sangyo Shobo), all in the library collection.				
Instructor	YAMAGUCHI Daizo				
Course Objectives					
<p>Learning purposes : To learn about various functional materials used in various fields (machinery, electronics, energy, environment, biology, medicine, sports, etc.) from specific examples. In the process, students will learn about the crystal structures and properties common to materials in general at the physical level, so that they will be able to understand the phenomena occurring in materials essentially rather than phenomenologically. As a result, students will be able to understand the functional expression and application of functional materials.</p> <p>Course Objectives :</p> <ol style="list-style-type: none"> <li>1. To be able to understand the types, properties and applications of functional materials.</li> <li>2. To be able to understand the common crystal structures and properties of materials.</li> </ol>					
Rubric					
	Excellent	Good	Acceptable	Not acceptable	
Achievement 1	To be able to explain specific knowledge of the types, properties and uses of functional materials.	To be able to explain the basic knowledge of the types, properties and applications of typical functional materials.	To be able to explain the basic knowledge of the types and applications of typical functional materials.	Not reached the left column.	
Achievement 2	To be able to explain in detail the common crystal structures and properties of materials.	Be able to give a basic account of the crystal structures and properties common to materials.	To be able to explain the basics of crystal structures common to materials.	Not reached the left column.	
Assigned Department Objectives					
Teaching Method					
Outline	<p>General or Specialized : Specialized</p> <p>Field of learning : Materials and structures</p> <p>Foundational academic disciplines : Materials and engineering / Materials engineering / Structural and functional materials</p> <p>Relationship with Educational Objectives : This class is equivalent to "(2) Acquire basic science and technical knowledge".</p> <p>Relationship with JABEE programs : The main goals of learning / education in this class are "(A) Deepening of basic knowledge of technology, A-2: "To be able to acquire and explain knowledge in the technical fields of "materials and structures", "motion and vibration", "energy and flow", "information, measurement and control", "design, production and management" and "machines and systems", also "A-1" is involved.</p> <p>Course outline : Materials used in industry can be broadly classified into two categories: structural materials and functional materials. Since the structural materials have already been studied in this course, the latter will be explained in this course.</p>				
Style	<p>Course method : Lectures will be given mainly on the board and using slides. Assignments will be given to deepen understanding of key terms.</p> <p>Grade evaluation method : Students will be assessed on the basis of their report work (60%) and their attitude to the class (40%). The content of the report assignment will be evaluated strictly. Students are expected to cite papers as references.</p>				
Notice	<p>Precautions on the enrollment : In addition to the 15 credit hours per credit, students are required to study 30 credit hours. Students are expected to follow the instructions of their teachers regarding these studies.</p> <p>Course advice : Although mathematical formulae are rarely used, a good knowledge of chemistry, including chemical reactions and organic chemistry, is required in many cases. As a preparatory study, students should have knowledge of the products related to the lecture contents.</p> <p>Foundational subjects : Chemistry I (2nd years), Chemistry II (3rd), Industrial Materials (M 2nd).</p> <p>Related subjects : Scientific Inquiry (MS 2nd), Material Strength Science (MS 2nd)</p> <p>Attendance advice : The functional materials discussed in this class are only a small part of the functional materials currently in use. Students are required to study the functional materials independently so that they can understand their functions and applications. Students who enter the room more than 15 minutes after the class starts will be treated as absent.</p>				
Characteristics of Class / Division in Learning					
<input type="checkbox"/> Active Learning		<input type="checkbox"/> Aided by ICT		<input type="checkbox"/> Applicable to Remote Class	
				<input type="checkbox"/> Instructor Professionally Experienced	
Elective subjects					

Course Plan				
			Theme	Goals
2nd Semester	3rd Quarter	1st	Guidance, Automobile (body and engine), Aircraft (Study outside class time: Assignment (1) Aircraft materials)	About aircraft materials. Understand the common crystal structures and properties of materials.
		2nd	Shinkansen bullet trains, PC chassis, moulds (Extra-curricular study: Assignment (2) Magnesium alloys)	Introduction to magnesium alloys. Learn about the types, properties and uses of functional materials.
		3rd	Turbine blades, space shuttles, innerwear (Study outside class time: Subject (3) Heat-resistant materials and shape memory alloys)	About heat resistant materials and shape memory alloys. Understand the common crystal structures and properties of materials.
		4th	Cutting tools, nano/micro components (Study outside class time: Task (4) Metallic glasses)	About metallic glasses. Learn about the types, properties and uses of functional materials.
		5th	Liquid crystal/plasma displays, hard disk drives (Study outside class time: Task (5) Materials used in storage devices)	Materials used in storage devices.
		6th	Light-emitting diodes, semiconductor lasers, inverters (Study outside class time: Task (6) Materials for light sources)	About materials as a light source. Understand the common crystal structures and properties of materials.
		7th	Optical switches, electromagnetic motors, magnetostrictive sensors for sound wave detection (Study outside class hours: Task (7) Light-sensitive materials, magnetic materials)	Light-sensitive materials and magnetic materials. To gain knowledge of the types, properties and uses of functional materials. Understand the common crystal structures and properties of materials.
		8th	Ultrasonic echo and non-destructive testing equipment, piezoelectric actuators, filters for communication equipment (Study outside class time: Assignment (8) Piezoelectric materials)	About piezoelectric materials
	4th Quarter	9th	Crystalline silicon, amorphous silicon and compound solar cells (Study outside class time: Assignment (9) Compound solar cells)	About compound solar cells
		10th	Thermoelectric and Peltier elements, Functional tiles, Superconducting magnets (Study outside class time: Assignment (10) Photocatalyst)	Photocatalysts. To learn about the types, properties and uses of functional materials.
		11th	High-temperature superconducting wires, Lithium-ion secondary batteries, Functional electrodes (Study outside class time: Assignment (11) Metal-based superconducting materials)	Metallic superconducting materials. To learn about the types, properties and applications of functional materials.
		12th	Fuel cells, seawater desalination system (Study outside class time: Assignment (12) Reverse osmosis membrane)	Reverse osmosis membranes. Learn about the types, properties and uses of functional materials.
		13th	Functional materials in the field of biology and medicine (Study outside class time: Assignment (13) Artificial joints and artificial hearts)	Artificial joints and heart prostheses. To learn about the types, properties and uses of functional materials
		14th	Functional materials in the field of sport (Out-of-class time study: carbon fibre)	About carbon fibre. To understand the types, properties and applications of functional materials. Understand the common crystal structures and properties of materials.
		15th	(2nd semester final exam)	
		16th	Return and commentary of exam answers	

#### Evaluation Method and Weight (%)

	Attitude	Presentation	Mutual Evaluations between students	Behavior	Portfolio	Reports	Total
Subtotal	40	0	0	0	0	60	100
Basic Proficiency	0	0	0	0	0	0	0
Specialized Proficiency	40	0	0	0	0	60	100
Cross Area Proficiency	0	0	0	0	0	0	0



Tsuyama College		Year	2021		Course Title	Long Term Internship
Course Information						
Course Code	0039		Course Category	Specialized / Elective		
Class Format	Practical training		Credits	Academic Credit: 2		
Department	Advanced Mechanical and Control System Engineering Course		Student Grade	Adv. 2nd		
Term	Intensive		Classes per Week			
Textbook and/or Teaching Materials						
Instructor	HOSOTANI Kazunori,TERAMOTO Takayuki,KONISHI Daijiro					
Course Objectives						
Learning purposes : The purpose of the internship is to deepen knowledge and improve research ability so as not to be separated from the technology of the real world. Students in the advanced course are required to carry out about 30 hours of off-campus training as part of Thesis Work. However, it is thought that there are many items that cannot be learned in the short time of 30 hours, so we have made it possible to select long-term internships (about 4 weeks, about 140 hours) as elective courses (2 credits) from the above mentioned short-term off-campus training.						
Course Objectives : 1. Explain the training content from a professional perspective through collaborative activities such as learning and research in collaboration with society ◎ Can recognize the responsibility and originality that engineers have on society ◎ Through collaborative activities, you can understand your role and communicate to work appropriately with others. ◎ You can design your own career through corporate activities						
Rubric						
	Excellent	Good	Acceptable	Not acceptable		
Achievement 1	The content of the training can be explained in reports and presentations from a professional point of view so that readers and the audience can fully understand the content of the training.	The content of the training can be explained in reports and presentations from a professional point of view so that readers and the audience can understand the content of the training.	The content of the training can be explained in reports and presentations.	You have not reached the level shown on the left.		
Achievement 2	Understand and fully explain the responsibilities and creativity that companies owe to society.	Understand and explain the responsibilities and creativity that companies owe to society.	Show the responsibilities and creativity that companies owe to society.	You have not reached the level shown on the left.		
Achievement 3	Through practical training, you can understand your role and communicate sufficiently with others (by presentation, etc.).	Through practical training, you can understand your role and communicate with others (by presentation, etc.).	Through practical training, you can communicate with others (by presentation, etc.).	You have not reached the level shown on the left.		
Achievement 4	Utilizing the practical training experience at the company, you can think about your career systematically and explain it sufficiently.	Utilizing the practical training experience at the company, you can think about your career systematically and explain it.	Utilizing the practical training experience at the company, you can explain your career .	You have not reached the level shown on the left.		
Assigned Department Objectives						
Teaching Method						
Outline	* Relationship with practical work: This subject is practiced at a private company outside the college with the aim of deepening knowledge and improving research ability so as not to be separated from the technology of the real world. It is set as a 2-credit course with the requirement of conducting practical training for about 4 weeks (about 140 hours).  General or Specialized : Specialized Field of learning : Experiment / practice Foundational academic disciplines : Engineering / Mechanical Engineering / Electrical and Electronic Engineering / Electronic Control Engineering / Information Engineering  Relationship with Educational Objectives : This class is equivalent to "(6) Through extracurricular activities and participation in advanced technology lectures and academic societies, the student has learned to work with local communities and as well has acquired a global perspective".  Relationship with JABEE programs : The main goal of learning / education in this class is "(H) H-1". Accompanyingly, it is also involved in "F-1, A-2, D-3 and G-1".  Course outline : Practical training for about 4 weeks or 140 hours at an off-campus training such as a company.					
Style	Course method : Practicing while engaging in actual work at companies. A review board will be held after the training on campus.  Grade evaluation method : Evaluation sheets from companies (60%), reports (20%) and presentations (20%) are used for evaluation.					

Notice	Precautions on the enrollment : Be sure to take out insurance when you go to practice.			
	Course advice : Be sure to attend the off-campus training and long-term internship briefing session as it will be held in advance. As a preliminary study, investigate the company to which you are practicing and its industry / business content. Be sure to follow the discipline of the company. intern's evaluation leads to school evaluation and affects recruitment and job hunting.			
	Foundational subjects : All the subjects you have learned.			
	Related subjects : Thesis Work I , II (Advanced Course 1st, 2nd)			
	Attendance advice : Unless it is unavoidable, do not be late or absent from the training.			
Characteristics of Class / Division in Learning				
<input type="checkbox"/> Active Learning		<input type="checkbox"/> Aided by ICT		<input type="checkbox"/> Applicable to Remote Class <input checked="" type="checkbox"/> Instructor Professionally Experienced
E l e c t i v e   S u b j e c t s				
Course Plan				
			Theme	Goals
1st Semester	1st Quarter	1st	Guidance (beginning of the school year)	You can plan your long-term internship course and your career.
		2nd	Decision of training company	You can plan your long-term internship course and your career.
		3rd	Confirmation of practical training contents with the supervisor / company staff	You can understand the contents at the internship destination and make a training plan.
		4th	Practical training in companies, etc.	Understand your own role and practice, and through the practice you can understand the responsibility and creativity that a company has on society.
		5th	Practical training in companies, etc.	Understand your own role and practice, and through the practice you can understand the responsibility and creativity that a company has on society.
		6th	Practical training in companies, etc.	Understand your own role and practice, and through the practice you can understand the responsibility and creativity that a company has on society.
		7th	Practical training in companies, etc.	Understand your own role and practice, and through the practice you can understand the responsibility and creativity that a company has on society.
		8th	Preparation for Internship debriefing session	From a professional point of view, the training content can be summarized in a report and a presentation manuscript.
	2nd Quarter	9th	Internship debriefing session	You can present the training content in an easy-to-understand manner from a professional perspective.
		10th	Participate in practical training at companies for about 4 weeks or 140 hours.	
		11th		
		12th		
		13th		
		14th		
		15th		
		16th		
2nd Semester	3rd Quarter	1st		
		2nd		
		3rd		
		4th		
		5th		
		6th		
		7th		
		8th		
	4th Quarter	9th		
		10th		
		11th		
		12th		
		13th		
		14th		
		15th		
		16th		
Evaluation Method and Weight (%)				

	Company Evaluation	Presentation	Mutual Evaluations between students	Behavior	Portfolio	Report	Total
Subtotal	60	20	0	0	0	20	100
Basic Proficiency	0	0	0	0	0	0	0
Specialized Proficiency	40	10	0	0	0	15	65
Cross Area Proficiency	20	10	0	0	0	5	35

Tsuyama College		Year	2021		Course Title	Practice on International Communication
Course Information						
Course Code	0040		Course Category	Specialized / Elective		
Class Format	Seminar		Credits	Academic Credit: 1		
Department	Advanced Mechanical and Control System Engineering Course		Student Grade	Adv. 2nd		
Term	Intensive		Classes per Week			
Textbook and/or Teaching Materials	Information on various events, training textbooks, etc.					
Instructor	KONISHI Daijiro,HOSOTANI Kazunori,TERAMOTO Takayuki					
Course Objectives						
Learning purposes : Improve communication skills in English and deepen understanding of various cultures and customs on the earth. Foster awareness as an engineer who can play an active role internationally.						
Course Objectives : 1. Understand the other person's thoughts in English, and be able to explain and convey your thoughts and specialized knowledge / skills in an easy-to-understand manner. 2. You can acquire an international sense and summarize the results.						
Rubric						
	Excellent	Good	Acceptable	Not acceptable		
Achievement 1	After understanding the other person thoughts in English regardless of the person to be communicated, such as a technician or the general public, you can convey your own opinions and ideas in an easy-to-understand manner while devising an explanation method, and gain a sufficient understanding.	After understanding the other person in English, you can convey your own opinions and ideas and gain understanding while devising an explanation method.	It can be said in an easy-to-understand manner using effective procedures and means in English.	It can not be said in an easy-to-understand manner using effective procedures and means in English.		
Achievement 2	Understand differences in culture and values, develop multifaceted perspectives and ways of thinking, and combine "newly acquired information" and "past knowledge" to come up with new ideas.	Understand the differences in culture and values, and consider while associating "newly acquired information" with "past knowledge."	You can associate "newly acquired information" with "past knowledge".	You can not associate "newly acquired information" with "past knowledge".		
Assigned Department Objectives						
Teaching Method						
Outline	General or Specialized : Specialized Field of learning : International communications and cultural differences Foundational academic disciplines : Foreign language / engineering  Relationship with Educational Objectives : This class is equivalent to "(6) Through extracurricular activities and participation in advanced technology lectures and academic societies, the student has learned to work with local communities and as well has acquired a global perspective".  Relationship with JABEE programs : The main goal of learning / education in this class is "(F) F - 3 ", also "(B) B-2"is involved.  Course outline : Participate in international exchange programs related to our school or others, expand your international perspective based on the knowledge and skills you have learned so far, and aim to improve your communication skills in English.					
Style	Course method : We will actively participate in international exchange programs related to our school or others and strive for self-improvement, and submit the designated report after participation. Presentations at international conferences, etc. made as part of special research are not included in this exercise.  Grade evaluation method : Evaluate by the 100-point method according to the event report. Credits will be accredited through the Advanced Course Steering Committee at the end of the school year. It is necessary to submit a credit application.					

Notice	<p>Precautions on the enrollment : This subject is a "subject that requires study outside of class hours". Classes are offered for 15 credit hours per credit, but 30 credit hours are required in addition to this. Follow the instructions of your instructor for these studies.</p> <p>Course advice : It is important to broaden your interest in different cultures and English, and to actively participate in and make efforts in international exchange programs related to our school and others. This is a course that can be taken for two years. Participate in meetings such as guidance as preparatory learning to be conducted in advance, and check training / training destination information and safety information (required). In addition, read reference books and have relevant knowledge about different cultures.</p> <p>Foundational subjects : All the subjects you have learned so far, especially English</p> <p>Related subjects : Practical English I , II (Advanced Course 1st, 2nd), Reading on Technical English (Advanced Course 1st), Thesis Work I , II (Advanced Course 1st, 2nd)</p> <p>Attendance advice : Since the class is mainly related to society, be aware that you are a student of our school when you participate. Be careful about your safety. Check with the instructor for international exchange events related to this subject.</p>
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#### Characteristics of Class / Division in Learning

<input type="checkbox"/> Active Learning	<input type="checkbox"/> Aided by ICT	<input type="checkbox"/> Applicable to Remote Class	<input type="checkbox"/> Instructor Professionally Experienced
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#### E l e c t i v e s u b j e c t s

#### Course Plan

			Theme	Goals
1st Semester	1st Quarter	1st	Participation in the event must be at least 30 hours.	Recognize the need for respect for the culture and history of each country and the tolerance to accept the differences.
		2nd	Includes participation in international exchange programs related to our school (actively if there is an opportunity to make a presentation)	Explain basic matters such as lifestyles, religious beliefs, and values of various countries.
		3rd	Participate in the event for a total of 30 hours or more (multiple events are acceptable) and submit a fixed report (travel time is not included in the exercise time). If you report the participation of the project, you can use the presentation materials to replace the outline of the exercises in the report.	Interpretation of cross-cultural events in relation to our own culture.
		4th		Explain the role that science and technology should play in the economic and social development of each country and region and the responsible behavior of engineers.
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	2nd Quarter	9th		
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		14th		
		15th		
		16th		
2nd Semester	3rd Quarter	1st		
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		7th		
		8th		
	4th Quarter	9th		
		10th		
		11th		
		12th		
		13th		
		14th		
		15th		
		16th		

#### Evaluation Method and Weight (%)

	Examination	Presentation	Mutual Evaluations between students	Behavior	Portfolio	Reports	Total
Subtotal	0	0	0	0	0	100	100
Basic Proficiency	0	0	0	0	0	0	0
Specialized Proficiency	0	0	0	0	0	100	100
Cross Area Proficiency	0	0	0	0	0	0	0