

Appended Form 1

Specifications for Major Program

Name of School (Program) School of Engineering Cluster 1(Mechanical Systems,
Transportation, Material and Energy)

Program name(Japanese)	
(English)	Program of Mechanical Systems Engineering
1. Academic Degree to be Acquired Bachelor's degree in Engineering	

2. Overview

This program offers education in the fundamentals of mechanical system engineering, the structure and function of mechanical systems and the principles of the design and processing of mechanical systems based on new concepts, computer-aided design (CAE and CAD), measurement and control technology, mechatronics technology, the principles of the design and production of new mechanical systems through intelligent numerical simulation and information processing, as well as basic fields such as the mechanics of materials, the dynamics of vibrations, system controls, and other fields. By offering such education, it aims to develop engineers who, having a broader perspective on human-machine relations and environmental issues, are able to assume cutting-

practice a curriculum based on the following policy:

The Program offers not only basic mechanical education but also specialized education in the structure and function of mechanical systems and the principles of the design and processing of mechanical systems based on new concepts, computer-aided design (CAE and CAD), measurement and control technology, mechatronics technology, and the principles of the design and production of new mechanical systems through intelligent numerical simulation and information processing.

In the first year, the students take Liberal Arts Education subjects such as Peace Science Courses, Basic Courses in University Education, common subjects, and Foundation Courses, as well as specialized basic subjects and specialized practical education, such as machine shop training.

In the first semester of the second year, the students take the specialized basic subjects that are important, together with subjects common to Cluster 1 such as "Mechanics of Materials" and "Fluid Dynamics". Then, from the second semester, the students take specialized subjects, such as highly professional subjects related to advanced technology that reflect the characteristics of this program, and subjects related to integrated systems technology.

In the third year, specialized subjects become major subjects, and the students take subjects required for this program. The program tries, as far as possible, not to allocate multiple specialized subjects to the same time-slot, allowing students to take specialized subjects provided by other programs in Cluster 1 according to their personal interests.

In the fourth year, the students are assigned to their respective research laboratories, choose their research topics, and write their graduation theses.

In the curriculum described above, teaching and learning will be implemented by utilizing active learning and online classes, depending on the delivery methods of the program, such as lectures and seminars.

In addition to strict grading using the standards clearly outlined in the syllabus, learning outcomes are evaluated based on the degree to which the goals set by the educational program are achieved.

5. Program Timing/Acceptance Conditions

- o When to start the program

The second semester of the second year

- o Credit Requirements

By the first semester of the second year, students must have acquired the Liberal Arts Education subjects and specialized basic subjects that are commonly specified in Cluster 1. Acceptance conditions for the program are not particularly specified.

6. Qualifications to be Acquired

Type-1 High School Teaching License (Industry)

(Students must acquire the required number of credits for the Type-1 High School Teaching License (Industry), in addition to the required number of credits for this program.)

7. Class subjects and course content

* For class subjects, see the Course List table on the attached sheet.

* For course content, see the syllabus for each fiscal year.

8 Academic Achievements

At the end of each semester, the evaluation criteria are applied to each academic achievement evaluation item so that the level of attainment is clearly demonstrated. Students' grade calculation for each subject, from admission to the current semester, is given in one of three levels: "Excellent," "Very Good," and "Good," based on evaluation criteria calculated by adding the weighted values to the numerically-converted values of their academic achievement in each subject being evaluated (S = 4, A = 3, B = 2, and C = 1).

Evaluation of academic achievement	Converted values
S(Excellent: 90 points or higher)	4
A(Superior:80-89 points)	3
B(Good: 70-79 points)	2

Academic achievement	Evaluation criteria
Excellent	3.00 4.00
Very Good	2.00 2.99
Good	1.00 1.99

- * For the relationship between evaluation items and evaluation criteria, see the attached Sheet 2 .
- * For the relationship between evaluation items and class subjects, see the attached Sheet 3.
- * For the curriculum map, see the attached Sheet 4.

9. Graduation Thesis (Graduation Work) (Positioning, When and how it is assigned, etc.)

○ Positioning

The graduation thesis is designed to be one component of the overall evaluation of academic achievement.

It is positioned as one of the major subjects to evaluate the following:

Ability/Skills (2) Developing the ability to solve engineering issues on one's own initiative with flexible thinking and creativity

Collective capacity (1) Developing communication skills and the ability to globally collect and dispatch information.

○ When and how it is assigned

○When it is assigned: At the start of the fourth year. (Only those who satisfy the conditions for embarking on a graduation thesis will be assigned a thesis.)

Conditions for embarking on a graduation thesis

(1) Students must gain 43 credits or more out of 46 credits, the required number for graduation in Liberal Arts Education subjects.

(2) Students must gain 10 credits or more in the first group of specialized basic subjects

(3) Students must gain all of the required credits in Machine Design and Drawing, CAD, Machine Shop Training, Experiments in Mechanical Engineering , Experiments in Mechanical Engineering , and Mechanical Engineering Design and Production.

(4) Students must gain 11 credits or more out of 15 credits, the required number in Liberal Arts Education subjects, in the second group of specialized basic subjects.

(5) Students must gain a total of 68 credits or more in specialized basic subjects and specialized subjects.

○ How it is assigned

The research details of each laboratory to which the students can be assigned are explained by giving out handouts at a briefing held in February, in the second semester of the third year. After the number of students acceptable to each laboratory is given at the start of the fourth year, students who can begin their graduation theses are assigned as requested. In the case that the number of students exceeds the acceptable limit for a laboratory, adjustments may be made.

10. Responsibility-taking System

(1) PDCA Responsibility-taking System ("Plan," "Do," "Check," and "Act")

The cluster leader and program leader are responsible for executing this program. Faculty committee members responsible for this program make plans, while self-check/evaluation committee members responsible for this program make evaluations. The cluster and program teachers committee scrutinize the plans and evaluations from time to time for further improvement. When major issues arise, a working group may be established at the discretion of cluster leader and program leader.

(2) Program assessment

Criteria for program assessment

Whether or not each class subject is properly allocated in light of the goals of the program, and whether course content is appropriate

Whether or not, on average, students taking the course have achieved or exceeded the goals

Whether or not the system runs in proper cycles that enable the continuous improvement of the program

How the program is assessed

Conducting self-assessment for each subject based on class improvement questionnaires from students who have taken course, and based on performance rating results

Conducting questionnaires (obtained at graduation) in suitable cycles, to evaluate the validity of the goals

○ Position on feedback to students and how it should be conducted

Search records of each student's learning status, prepared by tutors, are kept.

Based on these records, study guidance is given to each student. At the same time, requests from students are discussed at teachers' meetings as needed. Furthermore, based on the results of the course improvement questionnaires obtained from students, subject teachers draw up class improvement plans that reflect the questionnaire results.

Cluster 1 Mechanical Systems, Transportation, Material and Energy

Subject type			Required No. of credits	Class subjects, etc.	No. of credits	Type of course registration	Year in which the subject is taken(*The lower figure means semester) Note 1															
							1st grade		2nd grade		3rd grade		4th grade									
							Spring	Fall	Spring	Fall	Spring	Fall	Spring	Fall								
Peace Science Courses																						
Basic Courses in University Education	Introduction to University Education																					
	Introductory Seminar for First-Year Students																					
Common Subjects	Area Courses		4	Courses in Natural Sciences	2	Compulsory elective																
	Foreign Languages	English (Note 2 3)	Basic English Usage	2	Basic English UsageI	1	Required															
					Basic English UsageII	1																
		Communication I	2	CommunicationI	1	Required																
				Communication I	1																	
		Communication II	2	Communication II	1	Required																
				Communication II	1																	
	Initial Foreign Languages (Select one language from German, French, Spanish, Russian, Chinese, Korean, and Arabic)		2	1 subjects from Basic language I	1	Compulsory elective																
				1 subjects from Basic language II	1																	
	Information and Data Science Courses			2	Introduction to Information and Data Sciences	2	Required															
Health and Sports Courses			2		1or2	Compulsory elective																
Basic Subjects			18	CalculusI	2	Required																
				CalculusII	2																	
				Linear AlgebraI	2																	
				Linear AlgebraII	2																	
				Seminar in Basic Mathematics I	1																	
				Seminar in Basic Mathematics II	1																	
				General Mechanics I	2																	
				General Mechanics II	2																	
				Basic Electromagnetism	2																	
				Experimental Methods and Laboratory Work in Physics I Note	1																	
			Experimental Methods and Laboratory Work in Physics II Note	1																		
			2	General Chemistry	2	Compulsory elective																
				Experimental Methods and Laboratory Work in Chemistry I Note	1																	
		Experimental Methods and Laboratory Work in Chemistry II Note		1																		
No. of credits required for graduation			46																			

Note 1 When students fail to acquire the credit during the term or semester marked with * in the boxes for the year in which the course is taken, they can

take the course in subsequent terms or semesters. Depending on class subject, courses may be offered in semesters or terms different from those

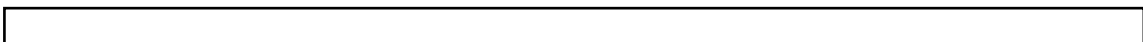
Note 2 The credit obtained by mastery of "English-speaking Countries Field Research" or self-directed study of "Online Seminar in English A B" cannot be counted towards the credit necessary for graduation. The credit obtained by Overseas Language Training can be recognized as Communication I or II if application is made in advance. For more details, please refer to the article on English in Liberal Arts Education in the student handbook.

Note 3 We have a recognition of credit system for foreign language proficiency tests. For more details, please refer to the article on English in Liberal Arts Education in the student handbook.

Note 4 Students must take both Experimental Methods and Laboratory Work 1credit and Experimental Methods and Laboratory Work 1credit .

Required subject
 Compulsory elective subject
 Free elective subject

		1T	2T	3T	4T	1T	2T	3T	4T	1T	2T	3T	4T	1T	2T	3T	4T	
Dynamics of Vibrations I	2				4													
Experiments in Mechanical Engineering I	1					3	3											
Experiments in Mechanical Engineering II	1							3	3									
Mechanical Engineering Design and Production	1							3	3									
Mechanical Materials I	2						4											
Mechanical Materials II	2								4									
Fracture Mechanics	2									4								
Fusion and Solidification Processings I	2							4										
Plastic Working and Powder Metallurgy II	2								4									
Materials Science	2					4												
Machining	2							4										
Fluid Dynamics II	2						4											
Heat Transfer I	2					4												
Combustion Engineering Fundamentals	2							4										
Internal Combustion Engines	2									4								
Data Processing and Numerical Analysis	2						4											
Theory of Elasticity and Plasticity	2							4										
Computational Solid Mechanics	2										4							
Mathematical Optimization	2											4						



Academic Achievements in Educational Program for Mechanical Systems Engin

The Relationship between Evaluation Items and Evaluation Criteria

Excellent

Very Good

Good

(1)

Curriculum Map of Mechanical Systems Engineering

Sheet

Academic achievements		1st grade		2nd grade		3rd grade		4th grade		
Evaluation Items		Spring	Fall	Spring	Fall	Spring	Fall	Spring	Fall	
Knowledge and Understanding	To develop the ability to work positively and independently on the development of local societies, international	Area Courses	Area Courses	Area Courses	Area Courses	Reliability Engineering	Internship			
		Health and Sports Courses	Health and Sports Courses							
		Introduction to University Education								
		Peace Science Courses								
	Acquiring necessary basic knowledge for an engineer and developing the ability to consider logically.	Introduction to Information and Data Sciences	CalculusII	Basic Electromagnetism						
		CalculusI	Seminar in Basic Mathematics II	General Chemistry						
		Seminar in Basic Mathematics I	Linear AlgebraII	Basic Engineering Computer Programming						
		Linear AlgebraI	General Mechanics II							
		General Mechanics I	Experimental Methods and Laboratory Work in Physics I							
		Experimental Methods and Laboratory Work in Chemistry I								
Abilities and Skills	Acquiring basis of mechanical system engineering steadily and developing the applied skill.	Practice of Mechanical Engineering	Applied Mathematics II	Applied Mathematics III	Engineering Mathematics A	Synthesis of Applied Mathematics				
		Introduction of Mechanical and Transportation Engineering	Probability and Statistics	Engineering Mathematics C	Mechanical Materials I	Mechanical Materials II				
		Engineering Mechanics	Mechanics of Material I	Dynamics of Vibrations I	Machining	Fracture Mechanics				
		Applied Mathematics I	Fluid Dynamics I	Fluid Dynamics II	Combustion Engineering Fundamentals	Internal Combustion Engines				
		Machine Design and Drawing	Fundamentals of Materials Processing	Mechanics of Materials II	Manufacturing Systems	Computational Solid Mechanics				
			An Introduction to Engineering Materials	Mechanism and Kinematics	Reliability Engineering	Mechatronics				
			Control Engineering I	Systems Engineering	Electrical and Electronic Engineering	Machine Design				
			Thermodynamics I	Materials Science	Theory of Elasticity and Plasticity	Plastic-Working and Powder Metallurgy II				
				Heat Transfer I	Fusion and Solidification Processings I	Data Structure and Algorithm				
				Data Processing and Numerical Analysis	Dynamics of Vibrations II					
				Mathematical Optimization	Mechanical System Control					
				Control Engineering II	Machine Elements Design II					
				Measurement and Signal Processing	Computer Programming					
			Machine Elements Design I							
	Developing the ability of solving the technological issues with flexible ideas and creativity.	Introductory Seminar for First-Year Students	Machine Shop Training (a)	Machine Shop Training (b)	Systems Engineering	Experiments in Mechanical Engineering I	Experiments in Mechanical Engineering II	Graduation Thesis	Graduation Thesis	
				Computer Aided Design			Mechanical Engineering Design and Production			
							Internship			
Comprehensive Abilities	Cultivating abilities of communication and of internationally collecting information and releasing it	Introductory Seminar for First-Year Students	Basic English UsageII			Experiments in Mechanical Engineering I	Experiments in Mechanical Engineering II	Graduation Thesis	Graduation Thesis	
		Basic English UsageI	Communication II	Technical English			Internship			
		CommunicationI	Communication II							
		Communication I								
		Basic language I								
		Basic language II								

Color-code Common subjects Foundation Courses Basic Specialized Subjects The first group Basic Specialized Subjects The second group Specialized Subjects
 Symbol Required subject Compulsory elective subject Free elective subject