For entrants in AY 2024

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 Transportation Systems

1. Academic degree to be Acquired Bachelor's degree in engineering

2. Overview

(1) Overview of "English-based Bachelor's Degree Program"

This program aims to foster and produce future members of a global society who have the knowledge to be innovative, creative, take leadership, and possess language abilities that will help them play an important role in the international world.

This program focuses specifically on producing individuals who are capable of addressing various global issues from an engineering perspective and contribute to the creation of new and valuable solutions that are significant to both the industrial and academic societies.

Students enrolled in the program will begin the curriculum from the first semester of their first year.

In the second year, students will set off on their major programs and take the designated courses which are offered at each cluster. Major program overview is as (2).

(2) Program overview of "Program of Transportation Systems".

Since ancient times, humankind has developed civilization through the transportation of people and goods. Vehicles, which are a product of civilization, play an important role as a means of transporting people and goods. Furthermore, with the development of civilization, these vehicles have expanded their field from the land to the sea and then to the air. In modern times, the globalization of humankind's activity has been increasing, and complicated transportation networks have been established throughout the whole geosphere, including land, sea, and air, to support humankind's various activities. Engineering technology for transportation equipment, especially marine vessels, aircraft, automobiles, railways, and distribution systems, has become more important than ever. Meanwhile today, the geosphere, which is the field in which transportation equipment is moved, is facing serious environmental problems. In considering engineering technology for transportation equipment, it is indispensable to have the perspective of creating and maintaining not only design, from the existing viewpoint of low environmental load, but also a system of coexistence, in which artificial transportation equipment and the natural environment are in harmony with each other. Therefore, it is extremely important to develop engineering technology for creating and maintaining the geospheric environment, while exploring the oceanic and aerial environments, both locally and globally, from a physical engineering perspective. It is crucially important to establish engineering technology that enables transportation equipment and the geosphere to coexist. The Program of Transportation Systems offers the comprehensive education in engineering required by engineers working in such areas.

To be more specific, the program offers general basic education in the first year, basic education in engineering, such as mathematics and dynamics, in the second year, and specialized engineering education in the third and fourth years. During this time, students are required to acquire a wide range of knowledge about transportation equipment and the geospheric environment, and to enlarge their thinking skills. In other words, students learn the engineering skills necessary to plan, manufacture, construct, and maintain transportation equipment that can coexist in harmony with the natural environment and with distribution systems. Students also analyze and assess the geospheric environment, and study the areas of engineering relevant to planning, designing, creating, and maintaining environment-related equipment and environmental systems, in order to reduce the impact on the environment

One of the characteristics of this program is that development of overall ability as engineers is particularly

emphasized, in addition to education in engineering knowledge. To that end, one of the key pillars of the program is the Project Creation Group, which allows students to actually plan, design, and manufacture products, and evaluates performance using engineering methodology. Through such learning, the program develops people who can actively take a comprehensive approach to technical issues related to transportation equipment and the geosphere, including land, ocean, air, and environment-related equipment. In other words, the program produces professionals who are able to discover problems on their own, explore solutions to the problems scientifically and rationally, and become engineers or researchers capable of taking action and showing leadership in solving problems in a harmonious and ethical way.

Technology developed by the program is mainly deployed in the areas of transportation equipment, environmental conservation, and natural energy utilization. To be more specific, the technology is not only deployed in hardware areas such as marine vessels, aircraft and spacecraft, automobiles, information and telecommunication equipment, and wind and ocean-current power generation, but also in software areas such as transportation and distribution systems, electronic and computer systems, systems engineering, and a wide range of other areas.

3. Academic Awards Policy (Goals of the Program and Policy for Awarding Degrees)

The Program of Transportation Systems aims to nurture engineers and researchers with expertise related to transportation equipment (engineering for planning, manufacturing, building, and maintaining transportation equipment and distribution systems that can coexist in harmony with the natural environment), and coexistence with the environment (engineering for planning, designing, creating and maintaining environment-related equipment and environmental systems to analyze and better understand the geospheric environment, and to reduce the impact on the environment). In addition to that, the Program of Transportation Systems trains engineers and researchers capable of taking action and showing leadership, who are able to actively discover engineering problems, explore solutions to the problems scientifically and rationally, and solve various engineering issues in an ethical and harmonious way.

Accordingly, this program awards a bachelor's degree in engineering to students who have acquired a Liberal Arts education aimed at developing a broad and deep range of general knowledge, a global perspective for peace, general decision-making skills, and a well-rounded character; a specialized education designed to meet the goals listed below; and the number of credits necessary to meet the standard of the course.

Goal A: The acquisition of general knowledge in the three fields of natural science, humanities and society, and education, aimed at nurturing ethics and the ability to think about things from various perspectives.

Goal B: The acquisition and understanding of the fundamental knowledge required by engineers and researchers.

Goal C: The nurturing of expertise related to transportation equipment and coexistence with the environment, and the nurturing of the ability to apply this expertise to solving problems.

Goal D: The nurturing of the ability to create designs related to transportation equipment and coexistence with the environment, and the nurturing of the ability to run projects.

Goal E: The nurturing of communication skills and the ability to transmit information required by engineers and researchers.

4. Curriculum Policy (Policy for Preparing and Implementing the Curriculum)

The Program of Transportation Systems prepares and puts into practice a curriculum based on the following policy, to ensure that students are able to achieve the goals of the program.

In the first year, students take core subjects composed of compulsory and elective subjects. These subjects correspond to Goal A. They are composed of languages, information subjects, mathematics and science subjects, the introductory subjects of this program, and other Liberal Arts Education subjects.

In the second year, students take compulsory subjects and elective subjects. These are composed of mathematical and dynamic systems subjects, which correspond to Goal B, and subjects related to mechanics of materials and fluid dynamics, which correspond to Goal C.

In the third year, students take subjects that are closely related to transportation equipment and coexistence with the environment. At the same time, students cultivate highly professional knowledge and abilities through experiments, training, and subjects related to design and production projects. These are composed of subjects

based on professional dynamic systems, which correspond to Goal C, and subjects based on project work, which correspond to Goals D and E.

In the fourth year, students work on their graduation theses, making full use of the abilities gained by meeting Goals A to E in the Program of Transportation Systems. Based on the theses and presentations submitted, mastery of Goals A to E is generally evaluated.

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, experiments and seminars.

In addition to grading in each subjects, learning outcomes are evaluated based on the degree to which the goals set by the educational program are achieved.

5. Program Timing/Acceptance Conditions

○ When to start the program

The English-based Bachelor's Degree programs begin in the first semester of the first year. Enrollment in Program of Transportation Systems occurs in the second semester of the second year.

○Additional Requirements

To determine acceptance into the English-based Bachelor's Degree program, all applicants are required to have an individual consultation with the faculty committee members.

○ Credit requirements

Before the start of the second semester of the second year. Assignment to educational programs is decided based on student request and academic results no later than the end of the first semester of the second year.

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.
* All courses are taught in Japanese. Course materials may be written in both Japanese and English or only English.

8 Academic Achievements

At the end of each semester, evaluation criteria are applied to each academic achievement evaluation item to clearly demonstrate the attainment level. 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 achievements (S = 4, A = 3, B = 2, and C= 1) in each subject being evaluated.

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 relation between evaluation item and evaluation criteria, see the attached sheet 2.
* For the relation between evaluation item and class subjects, see the attached sheet 3.
* For curriculum map, see the attached sheet 4.

9. Graduation Thesis (Graduation Research) (Positioning, when and how it is assigned, etc.)

Class Goals

Students are assigned to their respective educational subjects and tutors from the Program of Transportation Systems, and choose a topic related to a specialized field. Students apply their acquired knowledge and abilities and conduct research that enables them to enhance their problem-solving abilities while trying to gain new knowledge.

Doing the above aims at cultivating the following abilities (the learning goals and corresponding evaluation items are also given):

1. Students can demonstrate scientific knowledge concerning multiple solutions to the challenges of the research. (Goal A, evaluation items: Knowledge/Understanding-1, Ability/Skills-1).

2. Students can explain knowledge and methodology that forms a basis for constituent technology related to the challenges of the research. (Goal B, evaluation items: Knowledge/Understanding-2, -3, Ability/Skills-2, -3)

3. Students can explain not only the constituent technology, related to the phenomena which form the object of their research, but also integrated, applied technology. They are also able to explain the validity and credibility of their analytical method, the applicability of their engineering knowledge, and the limits and social significance of the technology. (Goal C, evaluation items: Knowledge/Understanding-4, -5, -6, Ability/Skills-4, -5, -6)

4. Students can discover problems in their chosen research on their own initiative, explore solutions to the problems scientifically and rationally, and solve the problems logically, harmoniously, and ethically. Students can explain the validity and credibility of their analytical method. (Goal D, evaluation item: Overall Ability-1)

5. Students can express the details of their research through the effective use of written explanations, charts, and formulas, and, at the same time, are able to give presentations in a proper way. (Goal E, evaluation item: Overall Ability-2)

6. Students can identify knowledge and issues in their research results in order to answer further complex questions. (Goal E, evaluation item: Overall Ability-2)

7. Students can conduct research systematically within constraints, and can compile their results to complete a paper. (Goal E, evaluation item: Overall Ability-2)

○ When and how it is assigned

In principle, educational subjects are decided based on the student's request. However, the acceptable number of students for each educational subject is limited due to the need for educational guidance. As such, when students' requests are disproportionately distributed, some adjustment is made. The following is the schedule for graduation theses.

1. In early February of the third year, how theses are assigned and the topic of the theses for each educational subject are explained.

2. In the middle of February in the third year, students attend a final presentation for further understanding of graduation theses.

3. At the end of March in the third year, where to assign those who pass the standard for embarking on a thesis is decided at orientation.

4. How to proceed with research varies according to the topic of research for each educational subject. Students begin with research into the literature, then attend seminars, conduct surveys and experiments, and continue to work actively on research under the guidance of tutors. (The tutors evaluate learning and research attitudes in the middle of February.)

5. More than one tutor, including the head tutor, check the evaluation of class goals 5 and 1 - 3.

6 At the beginning of February in the fourth year, the students submit their theses to two examiners (head tutor and deputy head tutor) to receive evaluation of their level of attainment of class goals 1 - 7.

7 The students receive evaluation of class goals 5 and 6 at the final presentation held in the middle of February in the fourth year.

○ Method of Evaluating Performance Rating

(1)Tutors make appropriate checks to ensure that students spend time studying on a daily basis, so that they can continually enhance their problem-solving abilities, and that they conduct research, using their research

daybooks, seminar data, research notebooks, relevant literature, etc. as reference and, based on this, the tutors evaluate the students' learning and research attitudes during the year.

(2)The head and deputy-head tutors evaluate the level of attainment of the class goals 1 - 7 based on the theses submitted.

(3)Furthermore, in the mid-term and final presentations, one or more teachers in attendance make an evaluation based mainly on the level of attainment of class goal 5.

Students who have earned a mark of 60% or more in all three of the above evaluations are considered to have passed and are awarded credit.

○ Other

This program aims to cultivate overall abilities by making full use of wide-ranging education and vision (Goal A , evaluation items: Knowledge/Understanding -1. Ability/Skills -1), basic knowledge (Goal B, evaluation items: Knowledge/Understanding -2, 3 Ability/Skills -2, 3), specialized knowledge and applied skills (Goal C, evaluation items: Knowledge/Understanding -4, 5, 6 Ability/Skills -4, 5, 6) design skills and the ability to get things done (Goal D, evaluation item: Overall Ability -1), communication skills and information transmitting skills (Goal E , evaluation item: Overall ability -2) , all of which are obtained through taking the Program of Transportation Systems. Also, based on the thesis and presentation content, mastery of the abilities that graduates of this program must acquire is evaluated in a comprehensive manner.

The graduation thesis must be written in English in “English-based Bachelor’s Degree Program”.

10. Responsibility-taking System

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

In order to monitor and improve this education program, an educational monitoring and improvement system has been established, as shown in the chart below, and has been in operation since 2003. This educational monitoring and improvement system is composed of two PDCA systems, the PDCA system responsible for the monitoring and improvement of each subject and its related subjects, and the PDCA system responsible for the monitoring and improvement of the entire Education Program, including the educational goals and the image of students that is presented.

Under the monitoring and improvement system for each course, each subject and its related subjects are monitored and improved in PDCA cycles as described below.

Plan: Preparing the Syllabus

For each subject, a WG checks the syllabus prepared by the person in charge of the subject, then either ratifies it or makes improvements.

Do: Giving a class

The person in charge of the subject gives a class based on the syllabus approved by the subject WG.

Check: Examining and Evaluating Related Subjects, Overall Examination and Evaluation of the Education Program

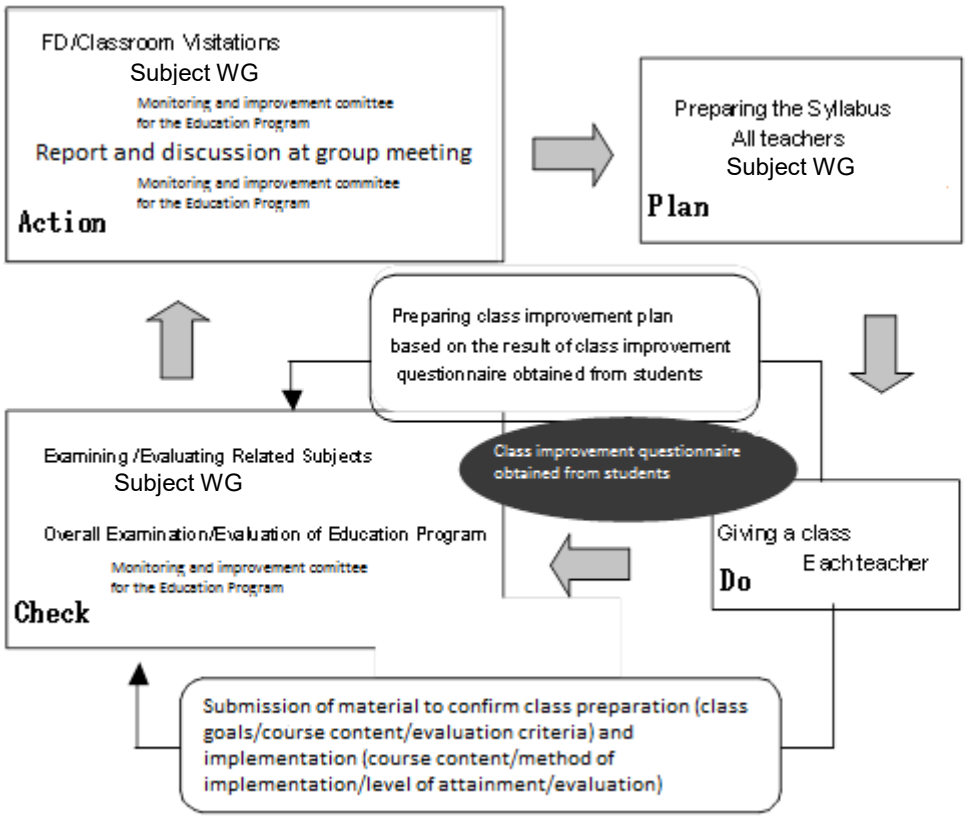
The subject WG checks if the planning and implementation of the class is appropriate, then ratifies it or makes improvements.

The monitoring and improvement committee for the Education Program checks if the planning and implementation of the class is appropriate, then either ratifies it or makes improvements. At that time, the materials for confirming the planning and implementation of the subject, as well as the results of class improvement questionnaire obtained from students, are used.

Action: FD/Classroom Visitations, Report to Faculty Member Meeting/ Discussion

FD and classroom visitations are conducted at the initiative of the subject WG and the monitoring and improvement committee for the Education Program.

When faculty members participate in external FD, the details must be reported at a faculty meeting.



(2) Education Program PDCA

In the monitoring and improvement system for the Education Program, the Education Program is monitored and improved in the PDCA style described below.

Plan: Creating the Education Program

The Education Program is created at by the subject WG, the monitoring and improvement committee for the Education Program, and the Educational Affairs Committee of the School of Engineering.

Do: Implementing the Education Program and Cooperating with Related Subjects

The Education Program is implemented by each teacher, by the subject WG, and by the monitoring and improvement committee for the Education Program. At that time, cooperation is enlisted from related subjects.

Check: Self-examination of the Education Program and External Evaluation

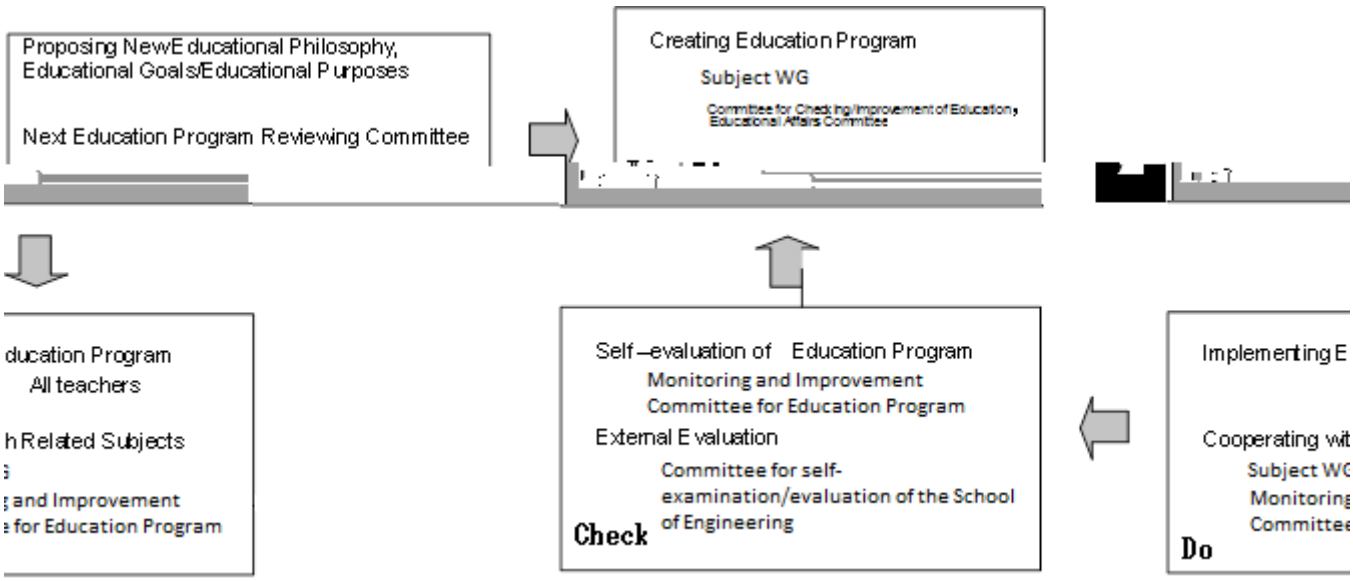
In the monitoring and improvement committee for the Education Program, problems with the program are examined based on the questionnaires obtained from graduates and students of the school for confirmation or making improvements

In the monitoring and improvement committee for the School of Engineering, external examination and evaluation of the planning and implementation of the Education Program are made.

Action: Proposing New Educational Philosophy, Educational Goals/Educational Purposes

At the next Education Program review committee, the educational philosophy and educational goals and purposes are reviewed by using the results of the above self-examination and external evaluation as

reference.



(3) Program evaluation

Under the two PDCA systems detailed above, the subject WG and monitoring and improvement committee for the Education Program carry out their checks and evaluations. The following describes the activities of each committee in detail.

Subject WG

All subjects provided by this Education Program are divided into several categories. A subject WG is held by the person in charge of each related subject.

In the subject WGs, class plans, achievements, and the result of classes given (based on class improvement questionnaires) are discussed.

Monitoring and Improvement Committee of the Education Program

While the responsibility for planning and implementing each subject, and its related subjects, lies with the above-mentioned WGs, the responsibility for identifying and solving problems with the entire Education Program rests on the monitoring and improvement committee for the Education Program. This committee is composed of directors and the persons responsible for the subject WGs. The committee checks and analyzes the activities of the subject WGs, as well as discussing problems with the entire Education Program.

Cluster 1 Mechanical Systems, Transportation, Material and Energy

Required subject (period of registration specified)

Compulsory elective subject (any of these subjects shall be registered)

Free elective subject (any of these subjects shall be registered)

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				
							1T	2T	3T	4T	1T	2T	3T	4T	1T	2T	3T	4T
Peace Science Courses			2		2	Compulsory elective												
Basic Courses in University Education	Introduction to University Education		2	Introduction to University Education	2	Required												
	Introductory Seminar for First-Year Students		2	Introductory Seminar for First-Year Students	2	Required												
	Advanced Seminar		0		1	Free elective												
Common Subjects	Area Courses		4	Courses in Arts and Humanities/Social Sc	2	Compulsory elective												
			4	Courses in Natural Sciences	2	Compulsory elective												
	Foreign Languages (Note 3)	English (Note 2) Basic English Usage	2	Basic English Usage I	1													
				Basic English Usage II	1													
		English (Note 2) Communication I	2	Communication IA	1	Required												
				Communication IB	1													
		English (Note 2) Communication II	2	Communication IIA	1	Required												
				Communication IIB	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													
			2	Introduction to Information and Data Sciencies	2	Required												
	Health and Sports Courses		2		1or2	Compulsory elective												
	Basic Subjects		18	Calculus I	2													
				Calculus II	2													
				Linear Algebra I	2													
				Linear Algebra II	2													
				Seminar in Basic Mathematics I	1													
				Seminar in Basic Mathematics II	1	Required												
				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													
				General Chemistry	2									○				
			2	Experimental Methods and Laboratory Work in Chemistry I Note	1	Compulsory elective		○										
				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 scheduled.

Note 2 The credit obtained by mastery of 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 or

Note 3

Note 4

Cluster 1　Basic Specialized Subjects

Required subject
Compulsory elective subject
Free elective subject

	Class Subjects	Credits	Type of course registration: Mechanical Systems Engineering	Transportation Systems	Materials Processing	Class Hours/Week: 1st grade Spring 1T	1st grade Spring 2T	1st grade Fall 3T	1st grade Fall 4T	2nd grade Spring 1T	2nd grade Spring 2T	2nd grade Fall 3T	2nd grade Fall 4T	3rd grade Spring 1T	3rd grade Spring 2T	3rd grade Fall 3T	3rd grade Fall 4T	4th grade Spring 1T	4th grade Spring 2T	4th grade Fall 3T	4th grade Fall 4T	Note
1st group	Applied Mathematics I	2						4														
	Applied Mathematics II	2								4												
	Applied Mathematics III	2										4										
	Engineering Mathematics A	2												4								
	Engineering Mathematics C	2											4									
	Probability and Statistics	2								4												
	Synthesis of Applied Mathematics	2														4						
	Practice of Mechanics	1						4														
	Introduction of Mechanical and Transportation Engineering	2						4														
2nd group	Technical English	1								2	2											
	Basic Engineering Computer Programming	2									4											
	Mechanics of Material I	2								4												
	Thermodynamics I	2								4												
	Fluid Dynamics I	2									4											
	Control Engineering I	2									4											
	An Introduction to Engineering Materials	2								4												
	Fundamentals of Materials Processing	2									4											
	Machine Design and Drawing	1						3	3													
	Computer Aided Design	1								3	3											
	Machine Shop Training (a)	1						3	3													
	Machine Shop Training (b)	1								3	3											

Students can select either Machine Shop Training (a) or Machine Shop Training (b)

Cluster 1 Specialized Subjects

Program of Transportation Systems

Required subject
Compulsory elective subject
Free elective subject

Class Subjects	Credits	Type of course registration	Class Hours/Week														Note
			1st grade				2nd grade				3rd grade				4th grade		
			Spring		Fall		Spring		Fall		Spring		Fall		Spring		Fall		
			1T	2T	3T	4T	1T	2T	3T	4T	1T	2T	3T	4T	1T	2T	3T	4T	
Summary of Applied Analysis	2								4										
Basic Electrical and Electronic Engineering	2													4					
Instrumentation Engineering	2									4									
Engineering Computer Programming	2											4							
Experiments and Analytical Procedures in Transportation Systems	2										6								
Ship Design and Practice	2								6										
Transportation Systems Project	4												4	4					
Fluid Dynamics for Vehicle and Environmental Systems	2									4									
Structural Mechanics	2								4										
Fundamentals in Dynamics	2								4										
Project Management	2									4									
Aircraft Design and Practice	2											6							
Structural Analysis and Design	2												4						
Theory of Elasticity	2											4							
Theory of Vibration	2										4								
Design of large scale systems	2												4						
Remote sensing	2											4							
Natural-Energy Utilization Engineering	2													4					
Viscous fluid and Turbulence	2										4								
Ocean-Atmosphere Systems	2												4						
Mathematical Optimization	2									4									
Transportation Vessels and Vehicles I	1										2								
Transportation Vessels and Vehicles II	1											2							
Transportation Vessels and Vehicles III	1											2							
Logistics Planning and Design	2													4					
Internship	1												3	3					
Graduation Thesis	5																		

Academic Achievements in Transportation Systems Program

The Relationship between Evaluation Items and Evaluation Criteria

		Excellent	Very Good	Good
(1)	Cultural subjects: Acquiring general knowledge from viewpoints of Nature, Human and Society Science, and the understanding of a sense of ethics.	To be able to sufficiently understand the current status of earth's environment and possible future problems. Also, to be able to adequately state multiple scientific perceptions concerning engineering	At the standard level, to be able to understand the current status of earth's environment and possible future problems. Also, to be able to state multiple scientific perceptions concerning engineering	At the minimum level, to be able to understand the current status of earth's environment and possible future problems. Also, to be able to state multiple scientific perceptions concerning engineering
(2)	Mathematical and mechanical subjects: To understand basic knowledge of mathematical dynamical system, which is essential knowledge for engineers and	To be able to sufficiently understand equations which dominate major elements of phenomena, through basic subjects such as mathematics, mechanics, kinematics, etc.	To be able to understand, in standard level, equations which dominate major elements of phenomena, through basic subjects such as mathematics, mechanics, kinematics, etc.	To be able to understand, at least, equations which dominate major elements of phenomena, through basic subjects such as mathematics, mechanics, kinematics, etc.
(3)	Information engineering subjects: To acquire understanding and basic knowledge required for engineers and researchers.	With regard to classes of information engineering, to be able to adequately understand information process technology based on mathematics and mechanics.	With regard to classes of information engineering, to be able to understand information process technology based on mathematics and mechanics at the	With regard to classes of information engineering, to be able to understand information process technology based on mathematics and mechanics at the standard
(4)	The area of structural engineering: The ability to apply the technical knowledge on structural engineering to solve issue related with transportation equipment and coexistence with the environment	Being able to fully explain the validity and		

Relationships between the evaluation items and class subjects

					Weighted values of evaluation items in the subject	Weighted values of evaluation items	Weighted values of evaluation items in the subject	Weighted values of evaluation items	Weighted values of evaluation items in the subject	Weighted values of evaluation items	Weighted values of evaluation items in the subject	Weighted values of evaluation items	Weighted values of evaluation items in the subject	Weighted values of evaluation items	Weighted values of evaluation items in the subject	Weighted values of evaluation items	Weighted values of evaluation items in the subject	Weighted values of evaluation items	Weighted values of evaluation items in the subject	Weighted values of evaluation items	Weighted values of evaluation items in the subject	Weighted values of evaluation items	Weighted values of evaluation items in the subject	Weighted values of evaluation items	Weighted values of evaluation items in the subject	Weighted values of evaluation items	
Liberal Arts Education	Introduction to University Education	2	Required	1semester	50	1											50	1												100
Liberal Arts Education	Introductory Seminar for First-Year Students	2	Required	1semester	50	1											50	1												100
Liberal Arts Education	Advanced seminar	1	Elective	2semester	50	1											50	1												100
Liberal Arts Education	Peace Science Courses	2	Elective	1semester	50	1											50	1												100
Liberal Arts Education	Basic English Usage I	1	Required	1semester																							100	1	100
Liberal Arts Education	Basic English Usage II	1	Required	2semester																							100	1	100
Liberal Arts Education	CommunicationI	1	Required	1semester																							100	1	100
Liberal Arts Education	Communication I	1	Required	1semester																							100	1	100
Liberal Arts Education	Communication II	1	Required	2semester																							100	1	100
Liberal Arts Education	Communication II	1	Required	2semester																							100	1	100
Liberal Arts Education	Basic language I	1	Elective	1semester																							100	1	100
Liberal Arts Education	Basic language II	1	Elective	1semester																							100	1	100
Liberal Arts Education	Introduction to Information and Data Sciencies	2	Required	1semester					50	1											50	1							100
Liberal Arts Education	Area Courses Arts and HumanitiesSocial Sciences)	2	Elective	1,2semesters	50	1											50	1											100
Liberal Arts Education	Area Courses Natural Sciences)	2	Elective	1,2semesters	50	1											50	1											100
Liberal Arts Education	Health and Sports Courses	1,2	Elective	1,2semesters	50	1											50	1											100
Liberal Arts Education	CalculusI	2	Required	1semester			50	1											50	1									100
Liberal Arts Education	CalculusII	2	Required	2semester			50	1											50	1									100
Liberal Arts Education	Linear AlgebraI	2	Required	1semester			50	1											50	1									100
Liberal Arts Education	Linear AlgebraII	2	Required	2semester			50	1											50	1									100
Liberal Arts Education	Seminar in Basic Mathematics I	1	Required	1semester			50	1											50	1									100
Liberal Arts Education	Seminar in Basic Mathematics II	1	Required	2semester			50	1											50	1									100
Liberal Arts Education	General Mechanics I	2	Required	1semester			50	1											50	1									100
Liberal Arts Education	General Mechanics II	2	Required	2semester			50	1											50	1									100
Liberal Arts Education	Basic Electromagnetism	2	Required	3semester			50	1											50	1									100
Liberal Arts Education	Experimental Methods and Laboratory Work in Physics I	1	Required	2semester			50	1											50	1									100
Liberal Arts Education	Experimental Methods and Laboratory Work in Physics	1	Required	2semester			50	1											50	1									100
Liberal Arts Education	General Chemistry	2	Elective	3semester			50	1											50	1									100
Liberal Arts Education	Experimental Methods and Laboratory Work in Chemistry I	1	Elective	2semester			50	1											50	1									100
Liberal Arts Education	Experimental Methods and Laboratory Work in Chemistry	1	Elective	2semester			50	1											50	1									100
Specialized Education	Applied Mathematics I	2	Required	2semester			50	1											50	1									100
Specialized Education	Applied Mathematics II	2	Required	3semester			50	1											50	1									100
Specialized Education	Applied Mathematics III	2	Required	4semester			50	1											50	1									100
Specialized Education	Probability and Statistics	2	Required	3semester			50	1											50	1									100
Specialized Education	Practice of Mechanics	1	Elective	2semester			50	1											50	1									100
Specialized Education	Introduction of Mechanical and Transportation Engineering	2	Required	2semester																							100	1	100
Specialized Education	Technical English	1	Required	3semester																							100	1	100
Specialized Education	Basic Engineering Computer Programming	2	Required	3semester					50	1											50	1		1					100

Curriculum Map of Transportation Systems

	Spring	Fall	Spring	Fall	Spring	Fall	Spring	Fall
	Introduction to University Education( )						Graduation Thesis( )	Graduation Thesis( )
	Introductory Seminar for First-Year Students( )	Advanced seminar( )						
	Peace Science Courses(○)							
	Area Courses(○)	Area Courses(○)						
	Health and Sports Courses(○)	Health and Sports Courses(○)						
	Calculus I( )	Calculus II( )					Graduation Thesis( )	Graduation Thesis( )
	Linear Algebra I( )	Linear Algebra II( )						
	Seminar in Basic Mathematics I( )	Seminar in Basic Mathematics II( )						
	General Mechanics I( )	General Mechanics II( )						
	Experimental Methods and Laboratory Work in Physics I( )		Basic Electromagnetism( )					
	Experimental Methods and Laboratory Work in Physics II( )							
	Experimental Methods and Laboratory Work in Chemistry I(○)		General Chemistry(○)					
	Experimental Methods and Laboratory Work in Chemistry II(○)							
		Applied Mathematics I( )	Applied Mathematics II( )	Applied Mathematics III( )				
		Practice of Mechanics( )	Probability and Statistics( )	Summary of Applied Analysis( )				
				Fundamentals in Dynamics(				
(3) Information Engineering Fields	Introduction to Information and Data Sciencies( )		Basic Engineering Computer Programming( )		Engineering Computer Programming( )		Graduation Thesis( )	Graduation Thesis( )
			Mechanics of Material I( )	Structural Mechanics( )	Theory of Elasticity(○)	Structural Analysis and Design(○)	Graduation Thesis( )	Graduation Thesis( )
			An Introduction to Engineering Materials( )		Theory of Vibration(○)			
			Fundamentals of Materials Processing( )					
			Thermodynamics I( )	Fluid Dynamics for Vehicle and Environmental Systems( )	Remote sensing(○)	Natural-Energy Utilization Engineering(○)	Graduation Thesis( )	Graduation Thesis( )
			Fluid Dynamics I( )	s	Viscous fluid and Turbulence(○)	Ocean-Atmosphere Systems(○)		
	Peace Science Courses(○)							
	Area Courses (○)	Area Courses (○)						
	Health and Sports Courses(○)	Health and Sports Courses(○)						
	Calculus I( )	Calculus II( )					Graduation Thesis( )	Graduation Thesis( )
	Linear Algebra I( )	Linear Algebra II( )						
	Seminar in Basic Mathematics I( )	Seminar in Basic Mathematics II( )						
	General Mechanics I( )	General Mechanics II( )						
	Experimental Methods and Laboratory Work in Physics I( )		Basic Electromagnetism( )					
	Experimental Methods and Laboratory Work in Physics II( )							
	Experimental Methods and Laboratory Work in Chemistry I(○)		General Chemistry(○)					
	Experimental Methods and Laboratory Work in Chemistry II(○)							
		Applied Mathematics I( )	Applied Mathematics II( )	Applied Mathematics III( )				
		Practice of Mechanics( )	Probability and Statistics( )	Summary of Applied Analysis( )				
				Fundamentals in Dynamics				
(3) Information Engineering Fields	Introduction to Information and Data Sciencies( )		Basic Engineering Computer Programming( )		Engineering Computer Programming( )		Graduation Thesis( )	Graduation Thesis( )
			Mechanics of Material I( )	Structural Mechanics( )	Theory of Elasticity(○)	Structural Analysis and Design(○)	Graduation Thesis( )	Graduation Thesis( )
			An Introduction to Engineering Materials( )		Theory of Vibration(○)			
			Fundamentals of Materials Processing( )					
			Thermodynamics I( )	Fluid Dynamics for Vehicle and Environmental Systems( )	Remote sensing(○)	Natural-Energy Utilization Engineering(○)	Graduation Thesis( )	Graduation Thesis( )
			Fluid Dynamics I( )		Viscous fluid and Turbulence(○)	Ocean-Atmosphere Systems(○)		
			Control Engineering I( )	Instrumentation Engineering(○)	Transportation Vessels and Vehicles I(○)	Design of Large Scale Systems(○)	Graduation Thesis( )	Graduation Thesis( )
				Mathematical Optimization(○)	Transportation Vessels and Vehicles II(○)	Logistics Planning and Design(○)		
					Transportation Vessels and Vehicles III(○)	Basic Electrical and Electronic Engineering(○)		
		Introduction of Mechanical and Transportation Engineering( )	Computer Aided Design( )	Project Management( )	Experiments and Analytical Procedures in Transportation Systems( )	Transportation Systems Project( )	Graduation Thesis( )	Graduation Thesis( )
		Machine Design and Drawing( )	Machine Shop Training (b)( )	Ship Design and Practice( )	Aircraft Design and Practice(○)	Internship( )		
		Machine Shop Training (a)( )						
	Basic English Usage I( )	Basic English Usage II( )	Technical English( )	Ship Design and Practice( )	Aircraft Design and Practice( )	Transportation Systems Project( )	Graduation Thesis( )	Graduation Thesis( )
	Communication I ( )	Communication II ( )						
	Communication IB( )	Communication IIB( )						
	Basic language I(○)							
	Basic language II(○)							

Ex Liberal Arts Education | Basic Specialized Subjects | Specialized Subjects | Graduation Thesis | Required subject