2026 Syllabus

Instructor with "＊" means an instructor with company experience.

Field	Course Name	Credits	Course Code	Semester	Class Style
Dept. S General Required	Comprehensive English IIA	1	511300	First	Lecture Class

Target Grade	Instructor	Office	E-mail Address	Office Hours
5	REYNOLDS, Stephanie / UTSUNOMIYA, Takako	Kanazawa C: 31.104		TBA

Course Objectives

	Keywords (10.5pt)	Learning Objectives (10.5pt)
1	Critical Thinking	In this course, students will be able to further improve English communication skills while sharing opinions in discussions, writing, and presentations. Students will apply critical thinking skills and gain knowledge about various topics related to engineering, science, technology, and society. Additionally, students will learn how to apply effective and appropriate communication strategies in discussions, presentations, and writing.
2	Communication	
3	Engineering	
4	Writing	
5	Presentation	

Course Description and Expectations for Students (10.5pt)

This course will offer discussion, group work, and reflection as types of active learning.
Students will prepare and participate in English discussions using the language skills that are already known.
Students will practice and apply new strategies for effective communication in discussions, presentations, and writing.
Students will write some academic essays/written reports and prepare some academic presentations.

It will be important for students to share their own opinions in relation to information from a variety of sources. Appropriate use of AI tools will be discussed, and students will learn how to appropriately reference and cite sources.
Students should be prepared with a binder or folder to keep handouts, writing tools for in-class work, and laptop computers for preparing presentations, researching related information, downloading class materials, and submitting online assignments.

Required Materials (textbooks, reference books, reserved books) (10.5pt)

Textbooks: None (Handouts)
Reference books: Pathways: Reading, Writing, and Critical Thinking, 3rd Edition, Levels 2, 3, and 4
Reserved books:

Knowledge/Skills Needed to Take This Course (Prerequisites) (10.5pt)

Intermediate English ability
Basic computer skills

No.	Program Objectives	Target Abilities for Students (9pt)
①	d	Students will be able to share opinions and ideas through discussions in English.
②	h	Students will be able to think critically about various topics related to environmental and biological engineering.
③	g	Students will be able to write an academic essay/report.
④	c	Students will be able to make academic presentations in English.
⑤	c	Students will be able to apply effective communication strategies in presentations and writing.
⑥	b	Students will be able to reference and cite sources appropriately.

Evaluation Criteria

Criteria and Ratio \ Evaluation Method		Exams	Quizzes	Reports	Presentations	Works	Portfolios	Others	Total
Total Evaluation Ratio		0	20	30	30	0	20	0	100
Comprehensive Strength Criteria	Ability to capture knowledge	0	5	10	5	0	5	0	25
	Ability to think, reason and create	0	5	10	5	0	5	0	25
	Collaboration and leadership	0	0	0	10	0	5	0	15
	Announcement / Expression / Communication	0	5	10	10	0	0	0	25
	Attitude and motivation for learning	0	5	0	0	0	5	0	10

* The numerical breakdown shown by Comprehensive Strength Criteria is an approximate guideline for class management.

Evaluation Method

Evaluation Method	Target Ability		Evaluation Methods and Important Points (10.5pt)
Exams	①		
	②		
	③		
	④		
	⑤		
	⑥		
Quizzes	①		Vocabulary, skill review, written response, reading/listening comprehension, and/or skill review assessments based on the content of in-class activities and assignments (20%) Feedback will be given in the following class session.
	②	✓	
	③		
	④		
	⑤	✓	
	⑥		
Reports	①		Some academic essays/written reports (30%) Each assignment will include an outline, first draft, writing conferences, and final draft. Feedback will be given during the following class session.
	②	✓	
	③	✓	
	④		
	⑤	✓	
	⑥	✓	
Presentations	①		Some academic presentations (30%) Each presentation will include an outline, preparation of supplementary materials, delivery & participation in discussion, and self-evaluation/reflection. Feedback will be given during the following class session.
	②	✓	
	③		
	④	✓	
	⑤	✓	
	⑥	✓	
Works	①		
	②		
	③		
	④		
	⑤		
	⑥		
Portfolios	①	✓	In-class or assignment handouts for preparation, review, and/or reflection of discussion activities (20%) Feedback will be given during the following class session.
	②	✓	
	③		
	④		
	⑤	✓	
	⑥		
Others	①		
	②		
	③		
	④		
	⑤		
	⑥		

Specific Achievement Criteria

Description of Ideal Achievement (10.5pt)	Description of Standard Achievement (10.5pt)
Professional-level, academic writing and presentations. Discuss 100% in fluent English.	Comprehensible writing and presentations. Discussions mostly in English.

Course Schedule

* In the "Time" column of the Assignments, the standard time required for the specified assignment is provided. For total-time credit courses, please take the time corresponding to each class for review and preview. (For example, in the case of a 2-credit course, please try to take 200 minutes per week.) Please follow the teacher's guidance for details.

Class No. Date	Class Content (10pt)	Method (10pt)	Assignments (10pt) (Preview and Review)	Time (Minutes)
1 /	Introduction/ Topic 1 (1) Students will be introduced to the syllabus and contents of the course. Students will participate in brainstorming and background building communication activities.	Brainstorming as a pre-reading technique, individual, pair, and group work; discussion	Review: Complete the worksheet based on the class activities. Reading	50
2 /	Topic 1 (2) Mini-presentation/discussion Students will review and discuss topics related to the reading or videos	Individual, pair, and group work; discussion	Preview: Study for the quiz Review: Complete the worksheet based on the class activities. Reading	50
3 /	Topic 1 (3) Quiz Academic Writing Students will brainstorm, outline, write, review, and revise a written assignment.	Individual, pair, and group work; discussion	Preview: Study for the quiz Review: Complete the written assignment (Due class 4) Reading	50
4 /	Topic 2 (1) Students will review and discuss topics related to the theme.	Individual, pair, and group work; discussion	Review: Complete the worksheet based on the class activities. Reading	50
5 /	Topic 2 (2) Mini-presentation/discussion Students will review and discuss topics related to the reading or videos	Individual, pair, and group work; discussion	Preview: Study for the quiz Review: Complete the worksheet based on the class activities. Reading	50
6 /	Topic 2 (3) Quiz Academic Writing Students will brainstorm, outline, write, review, and revise a written assignment.	Individual, pair, and group work; discussion	Preview: Study for the quiz Review: Complete the written assignment (Due class 7) Reading	50
7 /	Topic 3 (1) Students will review and discuss topics related to the theme.	Individual, pair, and group work; discussion	Review: Complete the worksheet based on the class activities. Reading	50
8 /	Topic 3 (2) Mini-presentation/discussion Students will review and discuss topics related to the reading or videos	Individual, pair, and group work; discussion	Preview: Study for the quiz Review: Complete the worksheet based on the class activities. Reading	50
9 /	Topic 3 (3) Quiz Academic Writing Students will brainstorm, outline, write, review, and revise a written assignment.	Individual, pair, and group work; discussion	Preview: Study for the quiz Review: Complete the written assignment (Due class 10) Reading	50
10 /	Topic 4 (1) Students will review and discuss topics related to the theme.	Individual, pair, and group work; discussion	Review: Complete the worksheet based on the class activities. Reading	50

Course Schedule

* In the "Time" column of the Assignments, the standard time required for the specified assignment is provided. For total-time credit courses, please take the time corresponding to each class for review and preview. (For example, in the case of a 2-credit course, please try to take 200 minutes per week.) Please follow the teacher's guidance for details.

Class No. Date	Class Content (10pt)	Method (10pt)	Assignments (10pt) (Preview and Review)	Time (Minutes)
11 /	Topic 4 (2) Mini-presentation/discussion Students will review and discuss topics related to the reading or videos	Individual, pair, and group work; discussion	Preview: Study for the quiz Review: Complete the worksheet based on the class activities. Reading	50
12 /	Topic 4 (3) Quiz Academic Writing Students will brainstorm, outline, write, review, and revise a written assignment.	Individual, pair, and group work; discussion	Preview: Study for the quiz Review: Complete the written assignment (Due class 13) Reading	50
13 /	Review of Readings and Topics 1-4 Presentation preparation Students will review and discuss topics related to the reading or videos, brainstorm ideas and opinions, and research information for an academic presentation	Individual, pair, and group work; discussion	Preview: Brainstorm Review: Complete outline and supplemental materials Reading	50
14 /	Review of Readings and Topics 1-4 Students will deliver presentations with appropriately cited sources and supplemental materials connected to their topic of research. Students will share peer feedback and reflect on their learning in the course.	Individual, pair, and group work; discussion	Preview: Practice presentation Review: Complete written reflection Reading	50
15 /	Self-Evaluation Students will be given oral and written feedback both overall and individually on their work. Students will also be encouraged to share their feedback about the course. *Presentation Project Returned*	Individual, pair, and group work; discussion		

2026 Syllabus

Instructor with "＊" means an instructor with company experience.

Field	Course Name	Credits	Course Code	Semester	Class Style
Dept. S General Required	Comprehensive English IIB	1	511400	Second	Lecture Class

Target Grade	Instructor	Office	E-mail Address	Office Hours
5	REYNOLDS, Stephanie / UTSUNOMIYA, Takako	Kanazawa C: 31.104		TBA

Course Objectives

	Keywords (10.5pt)	Learning Objectives (10.5pt)
1	Critical Thinking	In this course, students will be able to further improve English communication skills while sharing opinions in group discussions, presentations, and in writing. Students will apply critical thinking skills and understand content in various topics related to science, technology, engineering, and society. Additionally, students will learn and apply effective and appropriate communication strategies in discussions, presentations, and writing.
2	Communication	
3	Knowledge	
4	Writing	
5	Presentation	

Course Description and Expectations for Students (10.5pt)

This course will offer discussion, group work, and reflection as types of active learning.
Students will prepare and participate in English discussions using the language skills that are already known.
Students will practice and apply new strategies for effective communication in discussions, presentations, and writing.
Students will write some academic essays/written reports and prepare some academic presentations.

It will be important for students to share their own opinions in relation to information from a variety of sources. Therefore, students will learn how to appropriately reference and cite sources.
Students should be prepared with a binder or folder to keep handouts, writing tools for in-class work, and laptop computers for preparing presentations, researching related information, downloading class materials, and submitting online assignments.

Required Materials (textbooks, reference books, reserved books) (10.5pt)

Textbooks: None (Handouts)
Reference books: Pathways: Reading, Writing, and Critical Thinking, 3rd Edition, Levels 2, 3, and 4
Reserved books:

Knowledge/Skills Needed to Take This Course (Prerequisites) (10.5pt)

Intermediate English ability
Basic computer skills

No.	Program Objectives	Target Abilities for Students (9pt)
①	d	Students will be able to share opinions and ideas through discussions in English.
②	h	Students will be able to think critically about various topics related to areas of knowledge.
③	g	Students will be able to write an academic essay/report.
④	c	Students will be able to make academic presentations in English.
⑤	c	Students will be able to apply effective communication strategies in presentations and writing.
⑥	b	Students will be able to reference and cite sources appropriately.

Evaluation Criteria

Criteria and Ratio \ Evaluation Method		Exams	Quizzes	Reports	Presentations	Works	Portfolios	Others	Total
Total Evaluation Ratio		0	20	30	30	0	20	0	100
Comprehensive Strength Criteria	Ability to capture knowledge	0	5	10	5	0	5	0	25
	Ability to think, reason and create	0	5	10	5	0	5	0	25
	Collaboration and leadership	0	0	0	10	0	5	0	15
	Announcement / Expression / Communication	0	5	10	10	0	0	0	25
	Attitude and motivation for learning	0	5	0	0	0	5	0	10

* The numerical breakdown shown by Comprehensive Strength Criteria is an approximate guideline for class management.

Evaluation Method

Evaluation Method	Target Ability		Evaluation Methods and Important Points (10.5pt)
Exams	①		
	②		
	③		
	④		
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	②	✓	
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	④		
	⑤	✓	
	⑥	✓	
Presentations	①		Some academic presentations (30%) Each presentation will include an outline, preparation of supplementary materials, delivery of presentation, and self-evaluation/reflection. Feedback will be given in the following class session.
	②	✓	
	③		
	④	✓	
	⑤	✓	
	⑥	✓	
Works	①		
	②		
	③		
	④		
	⑤		
	⑥		
Portfolios	①	✓	In-class or assignment handouts for preparation, review, and reflection of discussion activities (20%) Feedback will be given in the following class session.
	②	✓	
	③		
	④		
	⑤	✓	
	⑥		
Others	①		
	②		
	③		
	④		
	⑤		
	⑥		

Specific Achievement Criteria

Description of Ideal Achievement (10.5pt)	Description of Standard Achievement (10.5pt)
Professional-level, academic writing and presentations. Discuss 100% in fluent English.	Comprehensible writing and presentations. Discussions mostly in English.

Course Schedule

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8 /	Topic 3 (2) Mini-presentation/discussion Students will review and discuss topics related to the reading or videos	Individual, pair, and group work; discussion	Preview: Study for the quiz Review: Complete the worksheet based on the class activities. Reading	50
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Course Schedule

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12 /	Topic 4 (3) Quiz Academic Writing Students will brainstorm, outline, write, review, and revise a written assignment.	Individual, pair, and group work; discussion	Preview: Study for the quiz Review: Complete the written assignment (Due class 13) Reading	50
13 /	Review of Readings and Topics 1-4 Presentation preparation Students will review and discuss topics related to the reading or videos, brainstorm ideas and opinions, and research information for an academic presentation	Individual, pair, and group work; discussion	Preview: Brainstorm Review: Complete outline and supplemental materials Reading	50
14 /	Review of Readings and Topics 1-4 Students will deliver presentations with appropriately cited sources and supplemental materials connected to their topic of research. Students will share peer feedback and reflect on their learning in the course.	Individual, pair, and group work; discussion	Preview: Practice presentation Review: Complete written reflection Reading	50
15 /	Self-Evaluation Students will be given oral and written feedback both overall and individually on their work. Students will also be encouraged to share their feedback about the course. *Presentation Project Returned*	Individual, pair, and group work; discussion		

2026 Syllabus

Instructor with "*" means an instructor with company experience

Field	Course Name	Credits	Course Code	Semester	Class Style
Dept. S Specialized Required	Engineering Design VA	2	520400	First	Experiment/Practice Class

Target Grade	Instructor	Office	E-mail Address	Office Hours
5	KUSHIMA, Yoshihiro / FUJISAWA, Takeshi / MEBUSAYA, Tossa*	Kanazawa C		Make an appointment in class

Course Objectives

Keywords (10.5pt)		Learning Objectives (10.5pt)
1	Expertise	Our goal is to develop students who will have a bird's eye view of engineering and be able to lead projects as leaders in the future. To this end, the fifth grade students aim to improve their knowledge, skills, theoretical thinking, judgment, problem-solving process, technical communication skills, and presentation skills through practical training.
2	Theoretical thinking/Decision making	
3	Problem-solving process	
4	Information gathering and analysis	
5	Presentation	

Course Description and Expectations for Students (10.5pt)

Under the advice of faculty members, students decide on a "theme" and engage in project activities, applying their knowledge in specialized fields such as mechanical engineering, information engineering, and business. In addition to their previous knowledge and experience, and how to collect and share information necessary for the progress of the project, students will acquire new knowledge through research through practical training. Then, activities based on logical thinking will be implemented.
The flow of the project will differ slightly depending on the main theme, but basically, the project will proceed in the following manner." Discover the problem → Understand the current situation → Determine the problem based on problem cause analysis and structural analysis → Set preconditions and achievement conditions for the solution → Determine the solution plan." Students must submit weekly reports. In addition, they must submit a final report at the end of the semester describing the progress of the project. This course will offer discovery learning, problem-solving learning and group discussion in class as a type of active learning.

Relationship between this course and business experiences

Based on the teacher's experiences, including technical/academic research in human interface and visual psychology, etc., and project management, the teacher will provide advice and discussion materials on research and key management factors.

Required Materials (textbooks, reference books, reserved books) (10.5pt)
Textbooks:
Reference books:
Reserved books:

Knowledge/Skills Needed to Take This Course (Prerequisites) (10.5pt)

Knowledge and experience learned and acquired so far.

No.	Program Objectives	Target Abilities for Students (9pt)
①	a	Students will be able to analyze issues, collect information, and identify problems.
②	h	Students will be able to think logically based on data, facts, and truth.
③	h	Students will be able to connect and apply new knowledge and acquired knowledge.
④	d	Students will be able to explain their analysis and ideas logically, in an easy-to-understand manner.
⑤	a	Students will be able to show an attitude of trying to objectively evaluate one's ability.
⑥		

Evaluation Criteria

Criteria and Ratio \ Evaluation Method		Exams	Quizzes	Reports	Presentations	Works	Portfolios	Others	Total
Total Evaluation Ratio		0	0	30	40	0	30	0	100
Comprehensive Strength Criteria	Ability to capture knowledge	0	0	10	5	0	10	0	25
	Ability to think, reason and create	0	0	10	5	0	10	0	25
	Collaboration and leadership	0	0	0	10	0	0	0	10
	Announcement / Expression / Communication	0	0	10	20	0	0	0	30
	Attitude and motivation for learning	0	0	0	0	0	10	0	10

* The numerical breakdown shown by Comprehensive Strength Criteria is an approximate guideline for class management.

Evaluation Method

Evaluation Method	Target Ability		Evaluation Methods and Important Points (10.5pt)
Exams	①		
	②		
	③		
	④		
	⑤		
	⑥		
Quizzes	①		
	②		
	③		
	④		
	⑤		
	⑥		
Reports	①	✓	Report will include individual work report (the project progress and outcomes). The format of the report will be announced by the instructors. Students must submit the final report at the end of the semester.
	②	✓	
	③	✓	
	④	✓	
	⑤	✓	
	⑥		
Presentations	①	✓	There will be a presentation at the end of the semester. Students will give oral progress of their projects. The format of the presentation will be announced by instructors, such as slides, poster, and/or any other styles.
	②	✓	
	③	✓	
	④	✓	
	⑤	✓	
	⑥		
Works	①		
	②		
	③		
	④		
	⑤		
	⑥		
Portfolios	①	✓	Students must submit weekly reports as the evidence of their projects. The format of the portfolio will be announced by the instructors.
	②	✓	
	③	✓	
	④	✓	
	⑤	✓	
	⑥		
Others	①		
	②		
	③		
	④		
	⑤		
	⑥		

Specific Achievement Criteria

Description of Ideal Achievement (10.5pt)	Description of Standard Achievement (10.5pt)
Design and plan the research project by oneself. Conduct research and development activities smoothly according to the research project plan. Present concrete results that are recognized as academically or technically significant, effective, and practical.	Design and plan the research project with the support of Instructor. Conduct research and development activities in accordance with the research project plan. Present concrete results along with technical innovations.

Course Schedule

* In the "Time" column of the Assignments, the standard time required for the specified assignment is provided. For total-time credit courses, please take the time corresponding to each class for review and preview. (For example, in the case of a 2-credit course, please try to take 200 minutes per week.) Please follow the teacher's guidance for details.

Class No. Date	Class Content (10pt)	Method (10pt)	Assignments (10pt) (Preview and Review)	Time (Minutes)
1-2 /	Project activity / review	Activity / Explanation / Report	Confirm the schedule and objectives. Making weekly report	60
3-4 /	Project activity / review	Activity / Explanation / Report	Making weekly report	60
5-6 /	Project activity / review	Activity / Explanation / Report	Making weekly report	60
7-8 /	Project activity / review	Activity / Explanation / Report	Making weekly report	60
9-10 /	Project activity / review	Activity / Explanation / Report	Making weekly report	60
11-12 /	Project activity / review	Activity / Explanation / Report	Making weekly report	60
13-14 /	Project activity / review	Activity / Explanation / Report	Making weekly report	60
15-16 /	Project activity / review	Activity / Explanation / Report	Making weekly report	60
17-18 /	Project activity / review	Activity / Explanation / Report	Making weekly report	60
19-20 /	Project activity / review	Activity / Explanation / Report	Making weekly report	60

Course Schedule

* In the "Time" column of the Assignments, the standard time required for the specified assignment is provided. For total-time credit courses, please take the time corresponding to each class for review and preview. (For example, in the case of a 2-credit course, please try to take 200 minutes per week.) Please follow the teacher's guidance for details.

Class No. Date	Class Content (10pt)	Method (10pt)	Assignments (10pt) (Preview and Review)	Time (Minutes)
21-22 /	Project activity / review	Activity / Explanation / Report	Making weekly report	60
23-24 /	Project activity / review	Activity / Explanation / Report	Making weekly report	60
25-26 /	Project activity / review	Activity / Explanation / Report	Making weekly report	60
27-28 /	Project activity / review	Activity / Explanation / Report	Making weekly report Prepare for the presentation and the report	60
29-30 /	Presentation	Presentation	Prepare for the presentation and the report	60

2026 Syllabus

Instructor with "*" means an instructor with company experience

Field	Course Name	Credits	Course Code	Semester	Class Style
Dept. S Specialized Required	Engineering Design VB	2	520500	Second	Experiment/Practice Class

Target Grade	Instructor	Office	E-mail Address	Office Hours
5	KUSHIMA, Yoshihiro / FUJISAWA, Takeshi / MEBUSAYA, Tossa	Kanazawa C		Make an appointment in class

Course Objectives

Keywords (10.5pt)		Learning Objectives (10.5pt)
1	Expertise	Our goal is to develop students who will have a bird's eye view of engineering and be able to lead projects as leaders in the future. To this end, the fifth grade students aim to improve their knowledge, skills, theoretical thinking, judgment, problem-solving process, technical communication skills, and presentation skills through practical training.
2	Theoretical thinking/Decision making	
3	Problem-solving process	
4	Information gathering and analysis	
5	Presentation	

Course Description and Expectations for Students (10.5pt)

Under the advice of faculty members, students decide on a "theme" and engage in project activities, applying their knowledge in specialized fields such as mechanical engineering, information engineering, and business. In addition to their previous knowledge and experience, and how to collect and share information necessary for the progress of the project, students will acquire new knowledge through research through practical training. Then, activities based on logical thinking will be implemented.
The flow of the project will differ slightly depending on the main theme, but basically, the project will proceed in the following manner." Discover the problem → Understand the current situation → Determine the problem based on problem cause analysis and structural analysis → Set preconditions and achievement conditions for the solution → Determine the solution plan." Students must submit weekly reports. In addition, they must submit a final report at the end of the semester describing the progress of the project. This course will offer discovery learning, problem-solving learning and group discussion in class as a type of active learning.

Relationship between this course and business experiences

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Required Materials (textbooks, reference books, reserved books) (10.5pt)
Textbooks:
Reference books:
Reserved books:

Knowledge/Skills Needed to Take This Course (Prerequisites) (10.5pt)

Knowledge and experience learned and acquired so far.

No.	Program Objectives	Target Abilities for Students (9pt)
①	a	Students will be able to analyze issues, collect information, and identify problems.
②	h	Students will be able to think logically based on data, facts, and truth.
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④	d	Students will be able to explain their analysis and ideas logically, in an easy-to-understand manner.
⑤	a	Students will be able to show an attitude of trying to objectively evaluate one's ability.
⑥		

Evaluation Criteria

Criteria and Ratio \ Evaluation Method		Exams	Quizzes	Reports	Presentations	Works	Portfolios	Others	Total
Total Evaluation Ratio		0	0	40	40	0	20	0	100
Comprehensive Strength Criteria	Ability to capture knowledge	0	0	10	5	0	5	0	20
	Ability to think, reason and create	0	0	20	5	0	5	0	30
	Collaboration and leadership	0	0	0	10	0	0	0	10
	Announcement / Expression / Communication	0	0	10	20	0	0	0	30
	Attitude and motivation for learning	0	0	0	0	0	10	0	10

* The numerical breakdown shown by Comprehensive Strength Criteria is an approximate guideline for class management.

Evaluation Method

Evaluation Method	Target Ability		Evaluation Methods and Important Points (10.5pt)
Exams	①		
	②		
	③		
	④		
	⑤		
	⑥		
Quizzes	①		
	②		
	③		
	④		
	⑤		
	⑥		
Reports	①	✓	Report will include individual work report (the project progress and outcomes). The format of the report will be announced by the instructors. Students must submit the final report at the end of the semester.
	②	✓	
	③	✓	
	④	✓	
	⑤	✓	
	⑥		
Presentations	①	✓	There will be a presentation at the end of the semester. Students will give oral progress of their projects. The format of the presentation will be announced by instructors, such as slides, poster, and/or any other styles.
	②	✓	
	③	✓	
	④	✓	
	⑤	✓	
	⑥		
Works	①		
	②		
	③		
	④		
	⑤		
	⑥		
Portfolios	①	✓	Students must submit weekly reports as the evidence of their projects. The format of the portfolio will be announced by the instructors.
	②	✓	
	③	✓	
	④	✓	
	⑤	✓	
	⑥		
Others	①		
	②		
	③		
	④		
	⑤		
	⑥		

Specific Achievement Criteria

Description of Ideal Achievement (10.5pt)	Description of Standard Achievement (10.5pt)
Design and plan the research project by oneself. Conduct research and development activities smoothly according to the research project plan. Present concrete results that are recognized as academically or technically significant, effective, and practical.	Design and plan the research project with the support of Instructor. Conduct research and development activities in accordance with the research project plan. Present concrete results along with technical innovations.

Course Schedule

* In the "Time" column of the Assignments, the standard time required for the specified assignment is provided. For total-time credit courses, please take the time corresponding to each class for review and preview. (For example, in the case of a 2-credit course, please try to take 200 minutes per week.) Please follow the teacher's guidance for details.

Class No. Date	Class Content (10pt)	Method (10pt)	Assignments (10pt) (Preview and Review)	Time (Minutes)
1-2 /	Project activity / review	Activity / Explanation / Report	Confirm the schedule and objectives. Making weekly report	60
3-4 /	Project activity / review	Activity / Explanation / Report	Making weekly report	60
5-6 /	Project activity / review	Activity / Explanation / Report	Making weekly report	60
7-8 /	Project activity / review	Activity / Explanation / Report	Making weekly report	60
9-10 /	Project activity / review	Activity / Explanation / Report	Making weekly report	60
11-12 /	Project activity / review	Activity / Explanation / Report	Making weekly report	60
13-14 /	Project activity / review	Activity / Explanation / Report	Making weekly report	60
15-16 /	Project activity / review	Activity / Explanation / Report	Making weekly report	60
17-18 /	Project activity / review	Activity / Explanation / Report	Making weekly report	60
19-20 /	Project activity / review	Activity / Explanation / Report	Making weekly report	60

Course Schedule

* In the "Time" column of the Assignments, the standard time required for the specified assignment is provided. For total-time credit courses, please take the time corresponding to each class for review and preview. (For example, in the case of a 2-credit course, please try to take 200 minutes per week.) Please follow the teacher's guidance for details.

Class No. Date	Class Content (10pt)	Method (10pt)	Assignments (10pt) (Preview and Review)	Time (Minutes)
21-22 /	Project activity / review	Activity / Explanation / Report	Making weekly report	60
23-24 /	Project activity / review	Activity / Explanation / Report	Making weekly report	60
25-26 /	Project activity / review	Activity / Explanation / Report	Making weekly report	60
27-28 /	Project activity / review	Activity / Explanation / Report	Making weekly report Prepare for the presentation and the report	60
29-30 /	Presentation	Presentation	Prepare for the presentation and the report	60

2026Syllabus

Instructor with "＊"means an instructor with company experience

Field	Course Name	Credits	Course Code	Semester	Class Style
Dept. S Specialized Elective	Internship II	1	520800	Intensive	Experiment/Practice Class

Target Grade	Instructor	Office	E-mail Address	Office Hours
5	FUJISAWA, Takeshi	Kanazawa C 31:113		Fri. 15:30 – 17:30

Course Objectives

Keywords (10.5pt)		Learning Objectives (10.5pt)
1 2 3 4 5	Career design Engineering skills and knowledge Skills for research Human skills	Following Internship I, students will receive practical training related to their career choices and future career at companies and universities in and outside of the prefecture. Students will be placed in situations that require more advanced knowledge and skills than Internship I. They will improve their specialized knowledge, learn the significance of engineering, how to be an engineer, manners as a member of society to become an engineer leader who can contribute to society in the future, autonomy, sense of responsibility, and sense of ethics.

Course Description and Expectations for Students (10.5pt)

Students will work on a project under the direction of their advisors, based on their chosen field of study.
Approximately 3 to 5 days of actual work is required to receive credit.

If no evaluation is submitted by the host, no credits will be awarded.

Advice on taking this class
- Be aware that this is an opportunity given to students by the host.
- Follow the directions of advisors and submit all assignments on time.
- Work independently and in groups.

Required Materials (textbooks, reference books, reserved books) (10.5pt)

Textbooks:
Reference books:
Reserved books:

Knowledge/Skills Needed to Take This Course (Prerequisites)

Academic and personal skills required as a technical college student in each specialized field.

No.	Program Objectives	Target Abilities for Students
①	a, h	Students will be able to complete tasks by applying what they have practiced.
②	e, i	Students will be able to understand their strengths and weaknesses better.
③	b, i	Students will be able to have a deeper understanding of their chosen industry.
④	b, i	Students will be able to develop a better idea of what they would like to pursue in the future.
⑤	b, i	Students will be able to reflect on what they did and set goals for the future.
⑥	c, d	Students will be able to develop attitudes and abilities needed to work productively with others.

Evaluation Criteria

Criteria and Ratio \ Evaluation Method		Exams	Quizzes	Reports	Presentations	Works	Portfolios	Others	Total
Total Evaluation Ratio		0	0	40	40	0	0	20	100
Comprehensive Strength Criteria	Ability to capture knowledge	0	0	10	0	0	0	4	14
	Ability to think, reason and create	0	0	15	10	0	0	4	29
	Collaboration and leadership	0	0	0	0	0	0	4	4
	Announcement / Expression / Communication	0	0	0	30	0	0	4	34
	Attitude and motivation for learning	0	0	15	0	0	0	4	19

* The numerical breakdown shown by Comprehensive Strength Criteria is an approximate guideline for class management.

Evaluation Method

Evaluation Method	Target Ability		Evaluation Methods and Important Points (10.5pt)
Exams	①		
	②		
	③		
	④		
	⑤		
	⑥		
Quizzes	①		
	②		
	③		
	④		
	⑤		
	⑥		
Reports	①	ㄴ	・Write a report on the contents and results of the work experience. Rather than simply describing the process and results, reflect on the overall content of the experience and describe in detail the knowledge and skills that were utilized in each process. ・Based on the results of reflecting on work experience, plan how to use it in future activities and specify action goals to be implemented.
	②		
	③	ㄴ	
	④		
	⑤		
	⑥		
Presentations	①	ㄴ	This evaluation will be made by the students' presentation at internship presentation session.
	②	ㄴ	
	③	ㄴ	
	④	ㄴ	
	⑤	ㄴ	
	⑥	ㄴ	
Works	①		
	②		
	③		
	④		
	⑤		
	⑥		
Portfolios	①		
	②		
	③		
	④		
	⑤		
	⑥		
Others	①		Evaluation will be made by the host company as to whether the student can work/study in the field of expertise in accordance with the engineering ethics.
	②	ㄴ	
	③		
	④	ㄴ	
	⑤	ㄴ	
	⑥	ㄴ	

Specific Achievement Criteria

Description of Ideal Achievement	Description of Standard Achievement
Understand the significance of the internship and set the purpose of participation in terms of both improving basic skills for working adults and to confirm the level of one's own expertise. Based on their own career development, they are able to decide which a host they would like to participate in and research the relevant industries or study fields. Students will be able to research the relevant field based on their own career development.	Understand the significance of internships and set a purpose for participating. To be able to research the field. To be able to carry out the work/study which the host gives without any problems.

Course Schedule

* In the "Time" column of the Assignments, the standard time required for the specified assignment is provided. For total-time credit courses, please take the time corresponding to each class for review and preview. (For example, in the case of a 2-credit course, please try to take 200 minutes per week.) Please follow the teacher's guidance for details.

Class No. Date	Class Content	Method	Assignments (Preview and Review)	Time (Minutes)
1 /	Understand the purpose and the significant aspects of internship education. Prepare the necessary documents and materials for the internship program.	Lecture		
2 /	Working on the internship program. -Follow the policy of the field. - Submit the assigned work results as instructed.	Practical work/study experience Instructed by a designated industry.		
3 /	Working on the internship program. -Follow the policy of the field. - Submit the assigned work results as instructed.	Practical work/study experience Instructed by a designated industry.		
4 /	Working on the internship program. -Follow the policy of the field. - Submit the assigned work results as instructed.	Practical work/study experience Instructed by a designated industry.		
5 /	Working on the internship program. -Follow the policy of the field. - Submit the assigned work results as instructed.	Practical work/study experience Instructed by a designated industry.		
6 /	Working on the internship program. -Follow the policy of the field. - Submit the assigned work results as instructed.	Practical work/study experience Instructed by a designated industry.		
7 /	Working on the internship program. -Follow the policy of the field. - Submit the assigned work results as instructed.	Practical work/study experience Instructed by a designated industry.		
8 /	Working on the internship program. -Follow the policy of the field. - Submit the assigned work results as instructed.	Practical work/study experience Instructed by a designated industry.		
9 /	Working on the internship program. -Follow the policy of the field. - Submit the assigned work results as instructed.	Practical work/study experience Instructed by a designated industry.		
10 /	Working on the internship program. -Follow the policy of the field. - Submit the assigned work results as instructed.	Practical work/study experience Instructed by a designated industry.		

Course Schedule

* In the "Time" column of the Assignments, the standard time required for the specified assignment is provided. For total-time credit courses, please take the time corresponding to each class for review and preview. (For example, in the case of a 2-credit course, please try to take 200 minutes per week.) Please follow the teacher's guidance for details.

Class No. Date	Class Content	Method	Assignments (Preview and Review)	Time (Minutes)
11 /	Working on the internship program. -Follow the policy of the field. - Submit the assigned work results as instructed.	Practical work/study experience Instructed by a designated industry.		
12 /	Working on the internship program. -Follow the policy of the field. - Submit the assigned work results as instructed.	Practical work/study experience Instructed by a designated industry.		
13 /	Preparation for presentation	Making powerpoint slides		
14 /	Preparation for presentation	Making powerpoint slides		
15 /	Final presentation - Present the achievement of the internship program	Preparation		

2026 Syllabus

Instructor with"*" means an instructor with company experience

Field	Course Name	Credits	Course Code	Semester	Class Style
Dept. S Specialized Elective	Engineering Mathematics	2	522000	First	Lecture Total

Target Grade	Instructor	Office	E-mail Address	Office Hours
5	KUSHIMA, Yoshihiro	31.117		16:50-17:30

Course Objectives

	Keywords (10.5pt)	Learning Objectives (10.5pt)
1	Complex numbers	Students will: (1) Review complex numbers for frequency response (2) Learn Laplace transforms for solving linear differential equations (3) Learn inverse Laplace transforms for solving linear differential equations (4) Learn transfer function for frequency analysis (5) Learn block diagrams
2	Laplace transforms	
3	Inverse Laplace transforms	
4	Transfer functions	
5	Block diagrams	

Course Description and Expectations for Students (10.5pt)

This course will provide total-time credits. 45 50-minute study times are worth one credit, and students need to have 30 50-minuite self-study times for 15 50-minute classes.
This course will offer experimental learning in class as a type of active learning.

This is a basic course in control engineering. We will cover the following topics:
1. Complex numbers
2. Laplace transforms
3. Inverse Laplace transforms
4. Transfer functions
5. Block diagrams

Students are expected to understand the meaning of the analysis method for control systems and expected to determine the stability of a control system.

Required Materials (textbooks, reference books, reserved books) (10.5pt)

Textbooks:
Reference books:
Reserved books:

Knowledge/Skills Needed to Take This Course (Prerequisites) (10.5pt)

Sufficient mathematical calculation skills.
Basic knowledge of differential and integral calculus.

No.	Program Objectives	Target Abilities for Students (9pt)
①	h, i	Be able to Calculate complex numbers.
②	h, i	Be able to use basic Laplace transforms.
③	h, i	Be able to solve linear differential equations with inverse Laplace transforms.
④	h, i	Be able to use transfer functions.
⑤	h, i	Be able to understand block diagrams.
⑥		

Evaluation Criteria

	Evaluation Method / Criteria and Ratio	Exams	Quizzes	Reports	Presentations	Works	Portfolios	Others	Total
	Total Evaluation Ratio	40	20	0	0	0	0	40	100
Comprehensive Strength Criteria	Ability to capture knowledge	20	10	0	0	0	0	20	50
	Ability to think, reason and create	10	5	0	0	0	0	10	25
	Collaboration and leadership	0	0	0	0	0	0	0	0
	Announcement / Expression / Communication	0	0	0	0	0	0	0	0
	Attitude and motivation for learning	10	5	0	0	0	0	10	25

* The numerical breakdown shown by Comprehensive Strength Criteria is an approximate guideline for class management.

Evaluation Method

Evaluation Method	Target Ability		Evaluation Methods and Important Points (10.5pt)
Exams	①	✓	A written exam is given at the end of the term and the results will account for 40% of the overall grade.
	②	✓	
	③	✓	
	④	✓	
	⑤	✓	
	⑥		
Quizzes	①	✓	Several 50-minute quizzes are given to improve comprehension and the results will account for 20% of the overall grade.
	②	✓	
	③	✓	
	④	✓	
	⑤	✓	
	⑥		
Reports	①		
	②		
	③		
	④		
	⑤		
	⑥		
Presentations	①		
	②		
	③		
	④		
	⑤		
	⑥		
Works	①		
	②		
	③		
	④		
	⑤		
	⑥		
Portfolios	①		
	②		
	③		
	④		
	⑤		
	⑥		
Others	①	✓	To support self-directed learning, assignments will be given as out of class work and the results will account for 40% of the overall grade.
	②	✓	
	③	✓	
	④	✓	
	⑤	✓	
	⑥		

Specific Achievement Criteria

Description of Ideal Achievement (10.5pt)	Description of Standard Achievement (10.5pt)
Can show physical phenomena as differential equations and represent them as dynamic systems for analyzing physical phenomena. Discriminate what is necessary in characterizing physical phenomena and analyze dynamic systems appropriately.	Be able to represent physical phenomena presented as differential equations as dynamic systems for analysis. Understand the matters that characterize physical phenomena and be able to analyze dynamic systems appropriately.

Course Schedule

* In the "Time" column of the Assignments, the standard time required for the specified assignment is provided. For total-time credit courses, please take the time corresponding to each class for review and preview. (For example, in the case of a 2-credit course, please try to take 200 minutes per week.) Please follow the teacher's guidance for details.

Class No. Date	Class Content (10pt)	Method (10pt)	Assignments (10pt) (Preview and Review)	Time (Minutes)
1 /	Course introduction Overview of System Control Complex numbers Trigonometric Functions	Guidance Lecture and Q&A	Understand the objectives of the course Preview and Review	200
2 /	Laplace Transforms (1)	Lecture and Q&A	Preview and Review lecture content and assignments	200
3 /	Laplace Transforms (2)	Lecture and Q&A	Preview and Review lecture content and assignments	200
4 /	Inverse Laplace Transforms	Lecture and Q&A	Preview and Review lecture content and assignments	200
5 /	Solving differential equations by Laplace transform	Lecture and Q&A	Preview and Review lecture content and assignments	200
6 /	Review for Quiz 1	Review	Prepare for quiz Preview and Review	200
7 /	Quiz 1	Quiz	Preview and Review	200
8 /	Quiz 1 Return Transfer Function (1)	Lecture and Q&A	Preview and Review lecture content and assignments	200
9 /	Transfer Function (2)	Lecture and Q&A	Preview and Review lecture content and assignments	200
10 /	Transfer Function (3)	Lecture and Q&A	Preview and Review lecture content and assignments	200

Course Schedule

* In the "Time" column of the Assignments, the standard time required for the specified assignment is provided. For total-time credit courses, please take the time corresponding to each class for review and preview. (For example, in the case of a 2-credit course, please try to take 200 minutes per week.) Please follow the teacher's guidance for details.

Class No. Date	Class Content (10pt)	Method (10pt)	Assignments (10pt) (Preview and Review)	Time (Minutes)
11 /	Block Diagram (1)	Lecture and Q&A	Preview and Review lecture content and assignments	200
12 /	Block Diagram (2)	Lecture and Q&A	Preview and Review lecture content and assignments	200
13 /	Review for Quiz 2	Review	Prepare for quiz Preview and Review	200
14 /	Quiz 2	Quiz	Review	200
15 /	Quiz 2 Return Review for Final Exam	Review	Prepare for the final exam	200
16 /	Final Exam	Exam	Review all materials	
17 /	Returning Final Exam Results	Review Self-evaluation		

2026 Syllabus

Instructor with "＊" means an instructor with company experience

Field	Course Name	Credits	Course Code	Semester	Class Style
Dept. S Specialized Elective	Applied Physics I	2	522300	First	Lecture Total

Target Grade	Instructor	Office	E-mail Address	Office Hours
5	HAN, Justin	Kanazawa C 31.119		Make an appointment in class

Course Objectives

	Keywords	Learning Objectives
1	Rigid Body Dynamics	Physics forms the foundation for the study of specialized engineering subjects. Students in this course will study about the various forces acting on planar rigid bodies and how those forces influence the motions of the bodies.
2	FBD and KD	
3	Kinematics	
4	Kinetics	
5	Equations of Motion	

Course Description and Expectations for Students

This course will provide total-time credits. 45 50-minute study times are worth one credit, and students need to have 30 50-minute self-study times for 15 50-minute classes.

The progression of this course is as follows:

1. Planar Kinematics
   - Absolute motion
   - Relative motion
2. Planar Kinetics
   - Inertia
   - Equations of Motion

This course will offer experiential learning as a type of active learning.

Required Materials (textbooks, reference books, reserved books)
Textbooks Engineering Mechanics: Dynamics, SI Units 15th ed. (Global Edition), ISBN-13: 978-1292451930
Reference books:
Reserved books:

Knowledge/Skills Needed to Take This Course (Prerequisites)

An understanding of:

- basic physics concepts
- static forces acting on rigid bodies

No.	Program Objectives	Target Abilities for Students
①	g, h, i	Be able to describe and create equations of motion for particles
②	g, h, i	Be able to explain the absolute and relative motions of rigid bodies.
③	g, h, i	Be able to break down dynamic systems into free body and kinetic diagrams.
④	g, h, i	Be able to explain the effect of forces on the motion of rigid bodies.
⑤	g, h, i	Be able to explain the concept of inertia and its influence on motion.
⑥	g, h, i	Be able to create equations of motion for systems of rigid bodies in motion.

Evaluation Criteria

Criteria and Ratio \ Evaluation Method		Exams	Quizzes	Reports	Presentations	Works	Portfolios	Others	Total
Total Evaluation Ratio		40	20	40	0	0	0	0	100
Comprehensive Strength Criteria	Ability to capture knowledge	20	10	20	0	0	0	0	50
	Ability to think, reason and create	10	5	10	0	0	0	0	25
	Collaboration and leadership	0	0	0	0	0	0	0	0
	Announcement / Expression / Communication	0	0	0	0	0	0	0	0
	Attitude and motivation for learning	10	5	10	0	0	0	0	25

* The numerical breakdown shown by Comprehensive Strength Criteria is an approximate guideline for class management.

Evaluation Method

Evaluation Method	Target Ability		Evaluation Methods and Important Points
Exams	①	✓	There will be a final exam at the end of the semester that will test students on the important concepts introduced throughout the semester.
	②	✓	
	③	✓	
	④	✓	
	⑤	✓	
	⑥	✓	
Quizzes	①	✓	There will be two 50-minute quizzes that will test students on the concepts introduced in the weeks before the quiz. For these quizzes, students will be allowed to prepare one sheet of notes for reference. Makeup quizzes will not be allowed without a valid excuse.
	②	✓	
	③	✓	
	④	✓	
	⑤	✓	
	⑥	✓	
Reports	①	✓	There will be homework for every topic introduced. Time will be allotted during class to review the homework assignments, but students will need to spend time outside of class to complete them. Late homework will be accepted after their submission deadline at a -10% late penalty per school day up to a max of 50%. However, any homework that is copied will result in a 0.
	②	✓	
	③	✓	
	④	✓	
	⑤	✓	
	⑥	✓	
Presentations	①		
	②		
	③		
	④		
	⑤		
	⑥		
Works	①		
	②		
	③		
	④		
	⑤		
	⑥		
Portfolios	①		
	②		
	③		
	④		
	⑤		
	⑥		
Others	①		
	②		
	③		
	④		
	⑤		
	⑥		

Specific Achievement Criteria

Description of Ideal Achievement	Description of Standard Achievement
- Able to translate the motion of particles into mathematical equations. - Able to explain the concepts of absolute and relative motions of rigid bodies and apply them to real-world situations. - Able to apply Newton's 2nd Law of Motion to establish detailed models of rigid bodies in motion. - Able to calculate and analyze the effect of forces on rigid bodies - Able to apply inertia into mathematical expressions - Able to set up and apply equations of motion for various real-world situations.	- Able to understand the translational and circular motion of particles - Able to understand the concepts of absolute and relative motions of rigid bodies. - Able to apply Newton's 2nd Law of Motion to create FBD and KD. - Able to explain the effect of forces on rigid bodies - Able to explain the concept of inertia - Able to explain the analyze the equations of motion for systems of rigid bodies

Course Schedule

* In the "Time" column of the Assignments, the standard time required for the specified assignment is provided. For total-time credit courses, please take the time corresponding to each class for review and preview. (For example, in the case of a 2-credit course, please try to take 200 minutes per week.) Please follow the teacher's guidance for details.

Class No. Date	Class Content	Method	Assignments (Preview and Review)	Time (Minutes)
1 /	Guidance and Review of Statics Students learn about the principles of dynamics and review prerequisite knowledge of statics.	Lecture	Review: Complete Assignment	200
2 /	Introduction to Kinematics Students review about the prerequisite knowledge of simple movement of a particle.	Lecture	Preview: Read Assigned Chapters Review: Complete Assignment	200
3 /	Introduction to Kinetics Students review the prerequisite knowledge of Free Body Diagrams (FBD) and Newton's 1st Law of Motion.	Lecture	Preview: Read Assigned Chapters Review: Complete Assignment	200
4 /	Introduction to Kinetics Students review the prerequisite knowledge of Free Body Diagrams (FBD) and Moments of a Force.	Lecture	Preview: Read Assigned Chapters Review: Complete Assignment	200
5 /	Introduction to Dynamics (1) Students learn about Kinetic Diagrams (KD) and Newton's 2nd Law of Motion.	Lecture	Preview: Read Assigned Chapters Review: Complete Assignment	200
6 /	Introduction to Dynamics (2) Students learn about Kinetic Diagrams (KD) and Newton's 2nd Law of Motion.	Lecture	Preview: Read Assigned Chapters Review: Complete Assignment	200
7 /	Midterm Test	Quiz and Review	Preview: Read Assigned Chapters Review: Complete Assignment	200
8 /	Introduction to Planar Kinematics (1) Students learn about the rotation about a fixed axis of a planar rigid body.	Lecture	Preview: Read Assigned Chapters Review: Complete Assignment	200
9 /	Introduction to Planar Kinematics (2) Students learn about relative motion of a planar rigid body.	Lecture	Preview: Read Assigned Chapters Review: Complete Assignment	200
10 /	Introduction to Planar Kinematics (3) Students learn about the Instantaneous Center of Zero Velocity.	Lecture	Preview: Read Assigned Chapters Review: Complete Assignment	200

Course Schedule

* In the "Time" column of the Assignments, the standard time required for the specified assignment is provided. For total-time credit courses, please take the time corresponding to each class for review and preview. (For example, in the case of a 2-credit course, please try to take 200 minutes per week.) Please follow the teacher's guidance for details.

Class No. Date	Class Content	Method	Assignments (Preview and Review)	Time (Minutes)
11 /	Introduction to Planar Kinematics (4) Students learn about relative acceleration of rigid bodies.	Lecture	Preview: Read Assigned Chapters Review: Complete Assignment	200
12 /	Introduction to Kinetics (1) Students learn about the Mass Moment of Inertia of composite bodies.	Lecture	Preview: Read Assigned Chapters Review: Complete Assignment	200
13 /	Introduction to Kinetics (2) Students learn about the effect of forces and moments on a body rotating about a fixed axis.	Lecture	Preview: Read Assigned Chapters Review: Complete Assignment	200
14 /	End of Term Test	Quiz and Review	Preview: Read Assigned Chapters Review: Complete Assignment	200
15 /	Review Students review their understanding of the introduced concepts.	Lecture	Preview: Prepare review questions Review: Study for the final exam	200
16 /	Final Exam			
17 /	Returning Final Exam Results			

2026 Syllabus

Instructor with "＊" means an instructor with company experience

Field	Course Name	Credits	Course Code	Semester	Class Style
Dept. S Specialized Elective	Applied Physics II	2	522400	Second	Lecture Total

Target Grade	Instructor	Office	E-mail Address	Office Hours
5	HAN, Justin	Kanazawa C 31.119		Make an appointment in class

Course Objectives

	Keywords	Learning Objectives
1	Work and Energy	Physics forms the foundation for the study of advanced concepts in specialized engineering subjects. Any body in space having an amount of energy experiences vibration. Students in this course will learn to identify and model the vibrational motion of rigid bodies.
2	Rigid Body Dynamics	
3	Degrees of Freedom	
4	Vibration	
5	Damping	

Course Description and Expectations for Students

This course will provide total-time credits. 45 50-minute study times are worth one credit, and students need to have 30 50-minute self-study times for 15 50-minute classes.

The progression of this course is as follows:

1. Planar Kinetics – Work and Energy
2. Undamped Free Vibration
3. Undamped Forced Vibration
4. Damped Free Vibration
5. Damped Forced Vibration

This course will offer experiential learning as a type of active learning.

Required Materials (textbooks, reference books, reserved books)

Textbooks: Engineering Mechanics: Dynamics, SI Units 15th ed. (Global Edition), ISBN-13: 978-1292451930

Reference books:

Reserved books:

Knowledge/Skills Needed to Take This Course (Prerequisites)

An understanding of:

- basic physics concepts
- static forces acting on rigid bodies
- dynamic forces acting on rigid bodies

No.	Program Objectives	Target Abilities for Students
①	g, h, i	Be able to analyze the work and energy of rigid bodies in motion.
②	g, h, i	Be able to explain undamped free vibration
③	g, h, i	Be able to explain undamped forced vibration
④	g, h, i	Be able to explain damped free vibration
⑤	g, h, i	Be able to explain damped forced vibration
⑥	g, h, i	Be able to explain the mathematical models of vibrational systems

Evaluation Criteria

Criteria and Ratio \ Evaluation Method		Exams	Quizzes	Reports	Presentations	Works	Portfolios	Others	Total
Total Evaluation Ratio		40	20	40	0	0	0	0	100
Comprehensive Strength Criteria	Ability to capture knowledge	20	10	20	0	0	0	0	50
	Ability to think, reason and create	10	5	10	0	0	0	0	25
	Collaboration and leadership	0	0	0	0	0	0	0	0
	Announcement / Expression / Communication	0	0	0	0	0	0	0	0
	Attitude and motivation for learning	10	5	10	0	0	0	0	25

* The numerical breakdown shown by Comprehensive Strength Criteria is an approximate guideline for class management.

Evaluation Method

Evaluation Method	Target Ability		Evaluation Methods and Important Points
Exams	①	✓	There will be a final exam at the end of the semester that will test students on the important concepts introduced throughout the semester.
	②	✓	
	③	✓	
	④	✓	
	⑤	✓	
	⑥	✓	
Quizzes	①	✓	There will be two 50-minute quizzes that will test students on the concepts introduced in the weeks before the quiz. For these quizzes, students will be allowed to prepare one sheet of notes for reference. Makeup quizzes will not be allowed without a valid excuse.
	②	✓	
	③	✓	
	④	✓	
	⑤	✓	
	⑥	✓	
Reports	①	✓	There will be homework for every topic introduced. Time will be allotted during class to review the homework assignments, but students will need to spend time outside of class to complete them. Late homework will be accepted after their submission deadline at a -10% late penalty per school day up to a max of 50%. However, any homework that is copied will result in a 0.
	②	✓	
	③	✓	
	④	✓	
	⑤	✓	
	⑥	✓	
Presentations	①		
	②		
	③		
	④		
	⑤		
	⑥		
Works	①		
	②		
	③		
	④		
	⑤		
	⑥		
Portfolios	①		
	②		
	③		
	④		
	⑤		
	⑥		
Others	①		
	②		
	③		
	④		
	⑤		
	⑥		

Specific Achievement Criteria

Description of Ideal Achievement	Description of Standard Achievement
- Able to apply the concepts of work and energy of rigid bodies to real world situations. - Able to create and analyze mathematical models of undamped, free vibrational systems. - Able to create and analyze mathematical models of undamped, forced vibrational systems. - Able to create and analyze mathematical models of damped, free vibrational systems. - Able to create and analyze mathematical models of damped, forced vibrational systems. - Able to explain the effect of masses, forces, and damping on the behavior of vibration systems.	- Able to identify the effect of work and energy on rigid bodies. - Able to identify mathematical models of undamped, free vibration systems. - Able to identify mathematical models of undamped, forced vibration systems. - Able to identify mathematical models of damped, free vibration systems. - Able to identify mathematical models of damped, forced vibration systems. - Able to identify the behaviors of each type of vibration

Course Schedule

* In the "Time" column of the Assignments, the standard time required for the specified assignment is provided. For total-time credit courses, please take the time corresponding to each class for review and preview. (For example, in the case of a 2-credit course, please try to take 200 minutes per week.) Please follow the teacher's guidance for details.

Class No. Date	Class Content	Method	Assignments (Preview and Review)	Time (Minutes)
1 /	Guidance and Review Students learn about the concept of vibration and review the principles of variable forces.	Lecture	Review: Complete Assignment	200
2 /	Introduction to Planar Kinetics (6) Students learn about the work and energy of a rigid body.	Lecture	Preview: Read Assigned Chapters Review: Complete Assignment	200
3 /	Introduction to Planar Kinetics (7) Students learn about the work and energy of a rigid body	Lecture	Preview: Read Assigned Chapters Review: Complete Assignment	200
4 /	Introduction to Vibrations Students learn about the basics of vibrations engineering.	Lecture	Preview: Read Assigned Chapters Review: Complete Assignment	200
5 /	Introduction to Undamped Free Vibration Students learn about undamped free vibration.	Lecture	Preview: Read Assigned Chapters Review: Complete Assignment	200
6 /	Review	Lecture	Preview: Read Assigned Chapters Review: Complete Assignment	200
7 /	Midterm Test	Quiz and Lecture	Preview: Read Assigned Chapters Review: Complete Assignment	200
8 /	Introduction to Undamped Forced Vibration Students learn about undamped forced vibration.	Lecture	Preview: Read Assigned Chapters Review: Complete Assignment	200
9 /	Introduction to Undamped Forced Vibration Students learn about undamped forced vibration.	Lecture	Preview: Read Assigned Chapters Review: Complete Assignment	200
10 /	Introduction to Damped Free Vibration Students learn about damped free vibration.	Lecture	Preview: Read Assigned Chapters Review: Complete Assignment	200

Course Schedule

* In the "Time" column of the Assignments, the standard time required for the specified assignment is provided. For total-time credit courses, please take the time corresponding to each class for review and preview. (For example, in the case of a 2-credit course, please try to take 200 minutes per week.) Please follow the teacher's guidance for details.

Class No. Date	Class Content	Method	Assignments (Preview and Review)	Time (Minutes)
11 /	Introduction to Damped Free Vibration Students learn about damped free vibration.	Lecture	Preview: Read Assigned Chapters Review: Complete Assignment	200
12 /	Introduction to Damped Forced Vibration Students learn about damped forced vibration.	Lecture	Preview: Read Assigned Chapters Review: Complete Assignment	200
13 /	Introduction to Damped Forced Vibration Students learn about damped forced vibration.	Lecture	Preview: Read Assigned Chapters Review: Complete Assignment	200
14 /	End of Term Test	Quiz and Lecture	Preview: Read Assigned Chapters Review: Complete Assignment	200
15 /	Review	Lecture	Preview: Prepare review questions Review: Study for the final exam	200
16 /	Final Exam			
17 /	Returning Final Exam Results			

2026 Syllabus

Instructor with "*" means an instructor with company experience

Field	Course Name	Credits	Course Code	Semester	Class Style
Dept. S Specialized Mech. Required	Mechanics of Materials I	2	540300	First	Lecture Total

Target Grade	Instructor	Office	E-mail Address	Office Hours
5	EVANS, Davis	31.118-1		Weekdays 16:50-17:30

Course Objectives

	Keywords (10.5pt)	Learning Objectives (10.5pt)
1	Load	Students will: (1) Understanding the materials for machine parts. (2) Learn the method of load analysis and free-body-diagram. (3) Understanding the axial, direct shear and torsional loading. (4) Learn the Mohr's circle that represents combined stresses.
2	Free body diagram	
3	Stresses	
4	Tensile and compression	
5	Bending	

Course Description and Expectations for Students (10.5pt)

This course will provide total-time credits. 40 50-minute study times are worth one credit, and students need to have 30 50-minute self-study times for 15 50-minute classes.
This course will offer multi-step engineering problem work using real world problem statements and material properties in class as a type of active learning.

This is a course on the basics of mechanics of materials. We will cover the following topics:
(1) Characteristics of materials for machine parts
Cast iron, steel, and nonferrous alloy. Tensile strength of materials, Stress-strain diagram.
(2) Methods of load analysis
Drawing the FBD (free-body-diagram)
(3) Static body stresses
Axial loading, direct shear loading, torsional loading, and pure bending loading.
Combined stresses and Mohr's circle.
Thermal stresses.

Required Materials (textbooks, reference books, reserved books) (10.5pt)
Textbooks: Fundamentals of Machine Components Design, 7th Edition, Asia Edition
Reference books:
Reserved books:

Knowledge/Skills Needed to Take This Course (Prerequisites) (10.5pt)

Know how to use a scientific calculator.

No.	Program Objectives	Target Abilities for Students (9pt)
①	h	Be able to explain work, energy and power.
②	h	Be able to explain the characteristics of materials for machine parts.
③	h	Be able to draw the free-body-diagram.
④	h,i	Be able to find magnitude of stresses caused by axial loading, direct shear loading and torsional loading.
⑤	h	Be able to explain the relationship between pure bending loading and stresses in the beam.
⑥	h,i	Be able to draw the Mohr's circle under the condition applied combined stresses.

Evaluation Criteria

	Evaluation Method / Criteria and Ratio	Exams	Quizzes	Reports	Presentations	Works	Portfolios	Others	Total
	Total Evaluation Ratio	40	20	40	0	0	0	0	100
Comprehensive Strength Criteria	Ability to capture knowledge	20	10	10	0	0	0	0	40
	Ability to think, reason and create	20	10	20	0	0	0	0	50
	Collaboration and leadership	0	0	0	0	0	0	0	0
	Announcement / Expression / Communication	0	0	0	0	0	0	0	0
	Attitude and motivation for learning	0	0	10	0	0	0	0	10

* The numerical breakdown shown by Comprehensive Strength Criteria is an approximate guideline for class management.

Evaluation Method

Evaluation Method	Target Ability		Evaluation Methods and Important Points (10.5pt)
Exams	①	∨	Descriptive tests are given on the content of the lectures: (1) Fundamentals of load analysis (2) Characteristics of materials for machine parts (3) Static body stresses
	②	∨	
	③	∨	
	④	∨	
	⑤	∨	
	⑥	∨	
Quizzes	①	∨	Descriptive quizzes given on the after of sections: (1) Free-body-diagram (2) Characteristics of materials
	②	∨	
	③	∨	
	④	∨	
	⑤	∨	
	⑥	∨	
Reports	①	∨	Out-of-class exercises will be assigned weekly. These exercises will be evaluated as the out-of-class learning portion of the course evaluation.
	②	∨	
	③	∨	
	④	∨	
	⑤	∨	
	⑥	∨	
Presentations	①		
	②		
	③		
	④		
	⑤		
	⑥		
Works	①		
	②		
	③		
	④		
	⑤		
	⑥		
Portfolios	①		
	②		
	③		
	④		
	⑤		
	⑥		
Others	①		
	②		
	③		
	④		
	⑤		
	⑥		

Specific Achievement Criteria

Description of Ideal Achievement (10.5pt)	Description of Standard Achievement (10.5pt)
(1) Calculate the magnitude of power, work and energy. (2) Understand the method of drawing FBD clearly and draw it. (3) Understand the characteristics of ferrous and nonferrous alloy for machine parts. (4) Understand diagram of stress and strain, and explain relationship between stress and strain. (5) Understand static body stresses, axial, shear and torsional loading clearly. (6) Understand relationship between pure bending loading and stresses clearly.	(1) Calculate the magnitude of power, work and energy. (2) Understand the method of drawing FBD. (3) Understand the characteristics of ferrous alloy for machine parts. (4) Understand diagram of stress and strain. (5) Understand difference between axial and shear loading. (6) Understand pure bending loading.

Course Schedule

* In the "Time" column of the Assignments, the standard time required for the specified assignment is provided. For total-time credit courses, please take the time corresponding to each class for review and preview. (For example, in the case of a 2-credit course, please try to take 200 minutes per week.) Please follow the teacher's guidance for details.

Class No. Date	Class Content (10pt)	Method (10pt)	Assignments (10pt) (Preview and Review)	Time (Minutes)
1 /	Course introduction An overview of the subject Basics of mechanics of materials	Lecture and Q&A Self-check	Understanding the course objectives Confirm the course schedule	200
2 /	Work, energy and power	Lecture and Q&A Self-check	Preview: Reading textbook of physics Review: Solving problems on the textbook	40 160
3 /	Introduction of load analysis	Lecture and Q&A Self-check	Preview: Reading textbook of physics Review: Solving problems on the textbook	40 160
4 /	Drawing the FBD (free-body-diagram)	Lecture and Q&A Self-check	Preview: Reading textbook Review: Solving problems on the textbook	60 140
5 /	Introduction of materials	Quiz Lecture and Q&A Self-check	Preview: Reading textbook Review: Solving problems on the textbook	60 140
6 /	Characteristics of ferrous materials Cast iron Carbon steel	Lecture and Q&A Self-check	Preview: Reading textbook Review: Solving problems on the textbook	60 140
7 /	Characteristics of nonferrous alloy materials Aluminum alloy Copper alloy	Lecture and Q&A Self-check	Preview: Reading textbook Review: Solving problems on the textbook	60 140
8 /	Introduction of static body stresses Axial loading Direct shear loading	Quiz Lecture and Q&A Self-check	Preview: Reading textbook Review: Solving problems on the textbook	60 140
9 /	Torsional loading	Lecture and Q&A Self-check	Preview: Reading textbook Review: Solving problems on the textbook	60 140
10 /	Basics of pure bending loading	Lecture and Q&A Self-check	Preview: Reading textbook Review: Solving problems on the textbook	60 140

Course Schedule

* In the "Time" column of the Assignments, the standard time required for the specified assignment is provided. For total-time credit courses, please take the time corresponding to each class for review and preview. (For example, in the case of a 2-credit course, please try to take 200 minutes per week.) Please follow the teacher's guidance for details.

Class No. Date	Class Content (10pt)	Method (10pt)	Assignments (10pt) (Preview and Review)	Time (Minutes)
11 /	Relationship between pure bending loading and stresses	Lecture and Q&A Self-check	Preview: Reading textbook Review: Solving problems on the textbook	60 140
12 /	Combined stresses Tensile and compressional stresses Shear stresses	Lecture and Q&A Self-check	Preview: Reading textbook Review: Solving problems on the textbook	60 140
13 /	Drawing the Mohr’s circle	Lecture and Q&A Self-check	Preview: Reading textbook Review: Solving problems on the textbook	60 140
14 /	Thermal stresses	Lecture and Q&A Self-check	Preview: Reading textbook Review: Solving problems on the textbook	60 140
15 /	Integrated learning	Lecture and Q&A Self-check	Preview: Review: Confirming the notebook for this course	200
16 /	Final examination	Descriptive test Self-check	Self-evaluation	
17 /	Review	Self-check Review		

2026 Syllabus

Instructor with "*" means an instructor with company experience

Field	Course Name	Credits	Course Code	Semester	Class Style
Dept. S Specialized Mech. Required	Mechanics of Materials II	2	540400	Second	Lecture Total

Target Grade	Instructor	Office	E-mail Address	Office Hours
5	EVANS, Davis	31.118-1		Friday 16:50-17:30

Course Objectives

	Keywords (10.5pt)	Learning Objectives (10.5pt)
1	Stresses	Students will: (1) Understanding the relationship between stress and strain. (2) Learn the method of determination of deflection of the beam. (3) Understanding failure theory. (4) Learn the characteristics of impact, fatigue and surface damage.
2	Strain	
3	Beam deflection	
4	Column Buckling	
5	Failure theory	

Course Description and Expectations for Students (10.5pt)

This course will provide total-time credits. 40 50-minute study times are worth one credit, and students need to have 30 50-minute self-study times for 15 50-minute classes.
This course will offer multi-step engineering problem work using real world problem statements and material properties in class as a type of active learning.

This is a course on the application of mechanics of materials. We will cover the following topics:
(1) Relationship between load and deflection
Stress-strain diagram, strain definition, and characteristics of cross section.
(2) Methods of determination of the beam deflection
(3) Failures
Column buckling
Failure theory
Impact, fatigue, surface damages

Required Materials (textbooks, reference books, reserved books) (10.5pt)

Textbooks: Fundamentals of Machine Components Design, 7th Edition, Asia Edition
Reference books:
Reserved books:

Knowledge/Skills Needed to Take This Course (Prerequisites) (10.5pt)

Know how to use a scientific calculator.

No.	Program Objectives	Target Abilities for Students (9pt)
①	h	Be able to explain strain definition.
②	h	Be able to explain the characteristics of cross-section.
③	h,i	Be able to determine the magnitude of deflection of beam.
④	h	Be able to explain column buckling.
⑤	h	Be able to explain failure theory.
⑥	h	Be able to explain fatigue and surface damage.

Evaluation Criteria

Criteria and Ratio \ Evaluation Method		Exams	Quizzes	Reports	Presentations	Works	Portfolios	Others	Total
Total Evaluation Ratio		40	20	40	0	0	0	0	100
Comprehensive Strength Criteria	Ability to capture knowledge	20	10	10	0	0	0	0	40
	Ability to think, reason and create	20	10	20	0	0	0	0	50
	Collaboration and leadership	0	0	0	0	0	0	0	0
	Announcement / Expression / Communication	0	0	0	0	0	0	0	0
	Attitude and motivation for learning	0	0	10	0	0	0	0	10

* The numerical breakdown shown by Comprehensive Strength Criteria is an approximate guideline for class management.

Evaluation Method

Evaluation Method	Target Ability		Evaluation Methods and Important Points (10.5pt)
Exams	①	∠	Descriptive tests are given on the content of the lectures: (1) Strain definition (2) Characteristics of cross-sectional shape (3) Deflection of the beam under bending moment
	②	∠	
	③	∠	
	④	∠	
	⑤	∠	
	⑥	∠	
Quizzes	①	∠	Descriptive quizzes given on the after of sections: (1) Deflection of the beam (2) Column buckling
	②	∠	
	③	∠	
	④	∠	
	⑤	∠	
	⑥	∠	
Reports	①	∠	Out-of-class exercises will be assigned weekly. These exercises will be evaluated as the out-of-class learning portion of the course evaluation.
	②	∠	
	③	∠	
	④	∠	
	⑤	∠	
	⑥	∠	
Presentations	①		
	②		
	③		
	④		
	⑤		
	⑥		
Works	①		
	②		
	③		
	④		
	⑤		
	⑥		
Portfolios	①		
	②		
	③		
	④		
	⑤		
	⑥		
Others	①		
	②		
	③		
	④		
	⑤		
	⑥		

Specific Achievement Criteria

Description of Ideal Achievement (10.5pt)	Description of Standard Achievement (10.5pt)
(1) Understand strain definition and measurement method. (2) Understand elastic stress-strain relationships and three-dimensional Mohr's circles. (3) Understand the beam deflection and determine the magnitude of deflection. (4) Understand the column buckling and determine the magnitude of buckling conditions. (5) Understand classification of failure type and fracture mechanisms clearly.	(1) Understand strain definition and measurement method. (2) Understand basics of elastic stress-strain relationships. (3) Understand basics of the beam deflection. (4) Understand basics of the column buckling. (5) Understand some basic fracture mechanisms.

Course Schedule

* In the "Time" column of the Assignments, the standard time required for the specified assignment is provided. For total-time credit courses, please take the time corresponding to each class for review and preview. (For example, in the case of a 2-credit course, please try to take 200 minutes per week.) Please follow the teacher's guidance for details.

Class No. Date	Class Content (10pt)	Method (10pt)	Assignments (10pt) (Preview and Review)	Time (Minutes)
1 /	Course introduction An overview of the subject Basics of mechanics of materials	Lecture and Q&A Self-check	Understanding the course objectives Confirm the course schedule	200
2 /	Strain definition Analysis of strain	Lecture and Q&A Self-check	Preview: Reading textbook Review: Solving problems on the textbook	40 160
3 /	Beam deflection (1) Elastic stress-strain relationships and Mohr’s circle	Lecture and Q&A Self-check	Preview: Reading textbook Review: Solving problems on the textbook	40 160
4 /	Beam deflection (2) Characteristics of cross-sectional shapes of the beam	Lecture and Q&A Self-check	Preview: Reading textbook Review: Solving problems on the textbook	60 140
5 /	Beam deflection (3) Deflection and spring rate in case of simple beam	Quiz Lecture and Q&A Self-check	Preview: Reading textbook Review: Solving problems on the textbook	60 140
6 /	Beam deflection (4) Determining elastic deflections (1)	Lecture and Q&A Self-check	Preview: Reading textbook Review: Solving problems on the textbook	60 140
7 /	Beam deflection (5) Determining elastic deflections (2)	Lecture and Q&A Self-check	Preview: Reading textbook Review: Solving problems on the textbook	60 140
8 /	Column buckling (1) Theories	Quiz Lecture and Q&A Self-check	Preview: Reading textbook Review: Solving problems on the textbook	60 140
9 /	Column buckling (2) Determining the magnitude of buckling load	Lecture and Q&A Self-check	Preview: Reading textbook Review: Solving problems on the textbook	60 140
10 /	Failure theory (1) Types of failure	Lecture and Q&A Self-check	Preview: Reading textbook Review: Solving problems on the textbook	60 140

Course Schedule

* In the "Time" column of the Assignments, the standard time required for the specified assignment is provided. For total-time credit courses, please take the time corresponding to each class for review and preview. (For example, in the case of a 2-credit course, please try to take 200 minutes per week.) Please follow the teacher's guidance for details.

Class No. Date	Class Content (10pt)	Method (10pt)	Assignments (10pt) (Preview and Review)	Time (Minutes)
11 /	Failure theory (2) Factor of safety Reliability	Lecture and Q&A Self-check	Preview: Reading textbook Review: Solving problems on the textbook	60 140
12 /	Impact	Lecture and Q&A Self-check	Preview: Reading textbook Review: Solving problems on the textbook	60 140
13 /	Fatigue	Lecture and Q&A Self-check	Preview: Reading textbook Review: Solving problems on the textbook	60 140
14 /	Surface damage	Lecture and Q&A Self-check	Preview: Reading textbook Review: Solving problems on the textbook	60 140
15 /	Integrated learning	Lecture and Q&A Self-check	Preview: Review: Confirming the notebook for this course	200
16 /	Final examination	Descriptive test Self-check	Self-evaluation	
17 /	Review	Self-check Review		

2026 Syllabus

Instructor with "＊"means an instructor with company experience

Field	Course Name	Credits	Course Code	Semester	Class Style
Dept. S Specialized Mech. Req.	Measurement Engineering	2	541100	Second	Lecture Total

Target Grade	Instructor	Office	E-mail Address	Office Hours
5	HUSSIEN, Alaa	Kanazawa C 31-124		Friday 16:30-17:30

Course Objectives

Keywords (10.5pt)		Learning Objectives (10.5pt)
1	Units- Dimensions- Standard deviation	Students will be able to find the units and dimensions of any physical quantity, define terms such as accuracy, precision, mean, median, etc., wring block gauge, set dial gauges to detect run outs, fabricate Roberval balances, use strain gauges to measure the weight of objects, set thermistors and LM35 to measure temperatures, use encoders to measure the speed of a shaft, design and make a photo sensor to measure the displacement in a step of 100μm.
2	Strain gauge-Whetstone bridge	
3	Thermistors-Thermocouple	
4	Rotary encoders-Shaft speed	
5	Photo sensor- Displacement	

Course Description and Expectations for Students (10.5pt)

This course will provide total-time credits. 45 50-minute study times are worth one credit, and students need to have 30 50-minute self-study times for 15 50-minute classes. This course will offer group work and collaboration while they design and fabricate the devices as a type of active learning. First, students study the basic units and dimensions, then go through the definition of some terms such as accuracy, precision, mean, error, etc. Students will learn how to calculate the standard deviation learn about function approximation using least square method. The second part will be project based learning topics. students will do experiments to measure some quantities using existed devices or design and fabricate their own devices to measure other quantities. First, they use block and dial gauge to detect runouts of machines. Second, fabricate a Roberval balance to measure the mass and compare it with the normal equal-arm balance. Second, they understand the structure of the strain gauge sensor and its experimental setup to measure weights of objects then do the experiment. Third, students will learn about many devices such as thermistor, thermostat, thermocouple and LM35. They will do experiments to measure the temperature of water using different sensors interfaced with Arduino microcontroller. Fourth, students study about the rotary encoders and then do an experiment to measure the speed and the direction of rotation of a dc motor shaft. Lastly, students learn about displacement sensors and then make a sensor to measure the displacement of with a resolution of 100μm.

Required Materials (textbooks, reference books, reserved books) (10.5pt)

Textbooks:

Reference books: "Theory and Design for Mechanical Measurements" *Richard* S. *Figliola*, 6th Ed. ISBN: 978-1-118-88127-9

Reserved books:

Knowledge/Skills Needed to Take This Course (Prerequisites) (10.5pt)

Students should master the basics of electric circuits such as Ohm's law and voltage divider rules. Students should know how to use laser cutters, 3-D printers, electric saw, drilling machines, milling machines and aware of the safety regulations of those machines. Also, they should set up and use Arduino microcontroller and create, compile and run a C^{++} code. Students should know well how to use some tools such as Vernier caliper, micrometer, multimeter, power supply, Oscilloscope.

No.	Program Objectives	Target Abilities for Students (9pt)
①	d	Able to find the units and dimensions of any physical quantities and understand many measurements terms
②	d,e	Detect the runouts of machines within a resolution of 1μm using block and dial gauges.
③	d,b,e	Understand the design features of Roberval balance and fabricate it-Measure the weights by strain gauges.
④	d,b,e	Set up experiments to measure the temperature using a thermistor and LM35 interfaced with Arduino μC.
⑤	d,b,e	Set up experiments to measure the speed and rotation direction of a dc motor shaft using a rotary encoder.
⑥	d,b,e	Make a photo sensor by using a photo diode and an LED and measure the displacement of a shutter.

Evaluation Criteria

Criteria and Ratio \ Evaluation Method		Exams	Quizzes	Reports	Presentations	Works	Portfolios	Others	Total
Total Evaluation Ratio		30	20	20	0	30	0	0	100
Comprehensive Strength Criteria	Ability to capture knowledge	10	10	10	0	0	0	0	30
	Ability to think, reason and create	10	10	5	0	10	0	0	35
	Collaboration and leadership	0	0	0	0	10	0	0	10
	Announcement / Expression / Communication	0	0	0	0	5	0	0	5
	Attitude and motivation for learning	10	0	5	0	5	0	0	20

* The numerical breakdown shown by Comprehensive Strength Criteria is an approximate guideline for class management.

Evaluation Method

Evaluation Method	Target Ability		Evaluation Methods and Important Points (10.5pt)
Exams	①	✓	There will be one exam, the final exam which will cover materials studied in the whole semester. It is worth 30% of your final grade. It is crucial that you study all your notes, worksheets before the exam.
	②	✓	
	③	✓	
	④	✓	
	⑤	✓	
	⑥	✓	
Quizzes	①	✓	After the 8th class, there will be a mid-term test. It will cover the material studied in the previous 8 classes. It is worth 20% of the final grade.
	②	✓	
	③	✓	
	④	✓	
	⑤	✓	
	⑥	✓	
Reports	①	✓	Every class the students are given a worksheet contains questions and problems to be solved out of the class. The worksheet of each class should be submitted at the beginning of the next class. The grading criteria will be based on content acquisition (10%) and quality of work through showing clear steps on how students get the answers (10%). This 20% of the total score is delegated for the out of the class tasks during the 200 min. assigned for it
	②	✓	
	③	✓	
	④	✓	
	⑤	✓	
	⑥	✓	
Presentations	①		
	②		
	③		
	④		
	⑤		
	⑥		
Works	①	✓	The work will be done either individually or in groups. The grading criteria is explained in the work rubric and will be based on the following: 1-Design and /or implementation: How did each student or group could conceive the best design and how they could set up the experiment or fabricate the device? (10%) 2-Operation: How reliable is the product or how good are the results and how could they find and figure out any problem arises? (10%) 3-Report: each student should write a report to describe the work and show the results. This report should be submitted after the completion of each project. It worth 10% of the total score as an out of the class task which can be done during the 200 min assigned for it.
	②	✓	
	③	✓	
	④	✓	
	⑤	✓	
	⑥	✓	
Portfolios	①		
	②		
	③		
	④		
	⑤		
	⑥		
Others	①		
	②		
	③		
	④		
	⑤		
	⑥		

Specific Achievement Criteria

Description of Ideal Achievement (10.5pt)	Description of Standard Achievement (10.5pt)
1-Students are able to conceive the best design and experiment set up to measure different quantities. 2-Measure the weight, temperature, speed, displacement, and analyze the results. 3-Create and execute C++ codes and set up Arduino µc to be used for measuring the temperature. 4-Use the technology such CAD software, laser cutter and 3-D printer to make the parts of the products. 5-Determine and figure out any problem arises during the experiment.	1-Students are able to make a design and an experiment set up to measure different quantities. 2-Measure the weight, temperature, speed, displacement, and ask for help to evaluate the results. 3-able to set up Arduino µc and write the C++ code then execute it to display the results. 4-Use some technology such as laser cutters and 3-D printers.

Course Schedule

* In the "Time" column of the Assignments, the standard time required for the specified assignment is provided. For total-time credit courses, please take the time corresponding to each class for review and preview. (For example, in the case of a 2-credit course, please try to take 200 minutes per week.) Please follow the teacher's guidance for details.

Class No. Date	Class Content (10pt)	Method (10pt)	Assignments (10pt) (Preview and Review)	Time (Minutes)
1 /	Course guidance Introduction to measurement The units of physical quantities Dimensional analysis of physical quantities	Course outlines and class style. A lecture demonstrates the topic	Read the course syllabus and review the notes of the lecture. Do the assignments.	200
2 /	Measurements terms definitions. Measurement error and error propagation.	A lecture demonstrates the topic.	Review materials of last class. Do the assignments. Prepare for the next class.	200
3 /	Standard deviation Z- score	A lecture demonstrates the topic.	Review materials of last class. Do the assignments. Prepare for the next class.	200
4 /	Function approximation. Taylor series-Least square method.	A lecture demonstrates the topic.	Review materials of last class. Do the assignments. Prepare for the next class.	200
5 /	Mass measurement (1). Equal-arm balance- Roberval balance.	A lecture demonstrates the topic. Demonstration of the equal-arm balance Solving a worksheet.	Review materials of last class. Do the assignments. Prepare for the next class.	200
6 /	Mass measurement (2) Roberval balance design and implementation Area Measurement using Plainmeter	Hands-on session for implementation.	Review materials of last class. Make the report. Prepare for the next class.	200
7 /	Force measurement (1) Introduction to sensors (strain gauge sensor).	A lecture demonstrates the topic.	Review materials of last class. Do the assignments. Prepare for the next class.	200
8 /	Force Measurement (2) An experiment of measuring the weight of an object.	Hands-on session.	Review materials of last class. Make the report. Study for the mid-term test.	200
9 /	Mid-term test Length measurement.	Test on the contents of class #1- class #8 A lecture demonstrates the topic.	Review materials of all classes. Do the assignments. Prepare for the next class.	200
10 /	Temperature measurement (1) Introduction to temperature sensors (Thermostat-Thermistor-Thermocouples)	A lecture demonstrates the topic.	Review materials of last class. Do the assignments. Prepare for the next class.	200

Course Schedule

* In the "Time" column of the Assignments, the standard time required for the specified assignment is provided. For total-time credit courses, please take the time corresponding to each class for review and preview. (For example, in the case of a 2-credit course, please try to take 200 minutes per week.) Please follow the teacher's guidance for details.

Class No. Date	Class Content (10pt)	Method (10pt)	Assignments (10pt) (Preview and Review)	Time (Minutes)
11 /	Temperature measurement (2) An experiment of measuring the temperature of some water using different sensors	Hands-on session.	Review materials of last class. Make the report Prepare for the next class.	200
12 /	Displacement measurement (1) Introduction to displacement sensors.	A lecture demonstrates the topic.	Review materials of last class. Do the assignments. Prepare for the next class.	200
13 /	Displacement measurement (2) An experiment to measure the displacement of a shutter using a photo diode.	Hands-on session	Review materials of last class. Make the report Prepare for the next class.	200
14 /	Speed measurement (1) Introduction to rotary encoders. Absolute encoder.	A lecture demonstrates the topic.	Review materials of last class. Do the assignments. Prepare for the next class.	200
15 /	Speed measurement (2) An experiment of measuring the speed of a dc motor shaft using a rotary encoder.	Hands-on session	Review materials of last class. Make the report. Study for the final exam.	200
16 /	Final Exam	Exam on the contents of classes #1 to class #15		
17 /	Final Exam Return. Self-check.	Return the exams results.		

2026 Syllabus

Instructor with "＊"means an instructor with company experience

Field	Course Name	Credits	Course Code	Semester	Class Style
Dept. S Specialized Mech. Required	Control Engineering	2	540800	Second	Lecture Total

Target Grade	Instructor	Office	E-mail Address	Office Hours
5	KUSHIMA, Yoshihiro	31.117		16:50-17:30

Course Objectives

Keywords (10.5pt)		Learning Objectives (10.5pt)
1	Transient response	Students will: (1) Learn to analyze transient response to an impulse or step input. (2) Learn frequency response analysis by using vector locus and Bode plots. (3) Acquire the capability to determine the stability of a system using the Hurwitz stability criterion.
2	Vector locus	
3	Bode plot	
4	Stability criterion	
5	PID control	

Course Description and Expectations for Students (10.5pt)

This course will provide total-time credits. 45 50-minute study times are worth one credit, and students need to have 30 50-minuite self-study times for 15 50-minute classes.
This course will offer experimental learning in class as a type of active learning.

This is a basic course in control engineering. We will cover the following topics:
1. Transient response analysis using Laplace transforms.
2. Frequency response analysis using vector locus and Bode plots.
3. Determining stability of a system by Hurwitz stability criterion.
4. Experiments on PID control using actual equipment.

Students are expected to understand the meaning of the analysis method for control systems and expected to determine the stability of a control system.

Required Materials (textbooks, reference books, reserved books) (10.5pt)

Textbooks:
Reference books:
Reserved books:

Knowledge/Skills Needed to Take This Course (Prerequisites) (10.5pt)

Sufficient mathematical calculation skills.
Basic knowledge of differential and integral calculus.

No.	Program Objectives	Target Abilities for Students (9pt)
①	h, i	Obtain impulse response and step response.
②	h, i	Understand the characteristics of vector locus for first-, second-, and third-order systems.
③	h, i	Describe Bode plots.
④	h, i	Determine the stability of a system.
⑤	h, i	Understand the PID control through the experiment.
⑥		

Evaluation Criteria

Criteria and Ratio \ Evaluation Method		Exams	Quizzes	Reports	Presentations	Works	Portfolios	Others	Total
Total Evaluation Ratio		40	20	0	0	0	0	40	100
Comprehensive Strength Criteria	Ability to capture knowledge	20	10	0	0	0	0	20	50
	Ability to think, reason and create	10	5	0	0	0	0	10	25
	Collaboration and leadership	0	0	0	0	0	0	0	0
	Announcement / Expression / Communication	0	0	0	0	0	0	0	0
	Attitude and motivation for learning	10	5	0	0	0	0	10	25

* The numerical breakdown shown by Comprehensive Strength Criteria is an approximate guideline for class management.

Evaluation Method

Evaluation Method	Target Ability		Evaluation Methods and Important Points (10.5pt)
Exams	①	✓	A written exam is given at the end of the term and the results will account for 40% of the overall grade.
	②	✓	
	③	✓	
	④	✓	
	⑤	✓	
	⑥		
Quizzes	①	✓	Several 50-minute quizzes are given to improve comprehension and the results will account for 20% of the overall grade.
	②	✓	
	③	✓	
	④	✓	
	⑤	✓	
	⑥		
Reports	①		
	②		
	③		
	④		
	⑤		
	⑥		
Presentations	①		
	②		
	③		
	④		
	⑤		
	⑥		
Works	①		
	②		
	③		
	④		
	⑤		
	⑥		
Portfolios	①		
	②		
	③		
	④		
	⑤		
	⑥		
Others	①	✓	To support self-directed learning, assignments will be given as out-of-class work and the results will account for 40% of the overall grade.
	②	✓	
	③	✓	
	④	✓	
	⑤	✓	
	⑥		

Specific Achievement Criteria

Description of Ideal Achievement (10.5pt)	Description of Standard Achievement (10.5pt)
(1) Obtain impulse response and step response for second-order and higher-order systems (2) Describe the vector locus for second-order and higher-order systems (3) Describe Bode plots for second-order and higher-order systems (4) Determine the stability of second-order and higher-order systems using the Hurwitz stability criterion	(1) Obtain impulse response and step response for a first-order system (2) Describe the vector locus for first-order and/or second-order systems (3) Describe Bode plots for first-order and/or second-order systems (4) Determine the stability of a second-order system using the Hurwitz stability criterion

Course Schedule

* In the "Time" column of the Assignments, the standard time required for the specified assignment is provided. For total-time credit courses, please take the time corresponding to each class for review and preview. (For example, in the case of a 2-credit course, please try to take 200 minutes per week.) Please follow the teacher's guidance for details.

Class No. Date	Class Content (10pt)	Method (10pt)	Assignments (10pt) (Preview and Review)	Time (Minutes)
1 /	Course introduction Impulse response Step response	Guidance Lecture and Q&A	Understand the objectives of the course Preview and Review	200
2 /	Step response of a first-order system	Lecture and Q&A	Preview and Review lecture content and assignments	200
3 /	Step response of a second-order system	Lecture and Q&A	Preview and Review lecture content and assignments	200
4 /	Transfer function and frequency response	Lecture and Q&A	Preview and Review lecture content and assignments	200
5 /	Vector locus	Lecture and Q&A	Preview and Review lecture content and assignments	200
6 /	Review for Quiz 1	Review	Prepare for quiz Preview and Review	200
7 /	Quiz 1	Quiz	Preview and Review	200
8 /	Quiz 1 Return Bode plot	Lecture and Q&A	Preview and Review lecture content and assignments	200
9 /	Bode plot	Lecture and Q&A	Preview and Review lecture content and assignments	200
10 /	Stability of control systems	Lecture and Q&A	Preview and Review lecture content and assignments	200

Course Schedule

* In the "Time" column of the Assignments, the standard time required for the specified assignment is provided. For total-time credit courses, please take the time corresponding to each class for review and preview. (For example, in the case of a 2-credit course, please try to take 200 minutes per week.) Please follow the teacher's guidance for details.

Class No. Date	Class Content (10pt)	Method (10pt)	Assignments (10pt) (Preview and Review)	Time (Minutes)
11 /	Hurwitz stability criterion	Lecture and Q&A	Preview and Review lecture content and assignments	200
12 /	Arduino MATLAB/Simulink Exercises(1)	Lecture and Q&A	Preview and Review lecture content and assignments	200
13 /	Arduino MATLAB/Simulink Exercises(2) Review for Quiz 2	Lecture and Q&A Review	Prepare for quiz Preview and Review	200
14 /	Quiz 2	Quiz	Review	200
15 /	Quiz 2 Return Review for Final Exam	Review	Prepare for the final exam	200
16 /	Final Exam	Exam	Review all materials	
17 /	Returning Final Exam Results	Review Self-evaluation		

2026 Syllabus

Instructor with "＊" means an instructor with company experience

Field	Course Name	Credits	Course Code	Semester	Class Style
Dept. S Specialized Mech. Elective	Materials Engineering	2	541000	First	Lecture Total

Target Grade	Instructor	Office	E-mail Address	Office Hours
5	HAN, Justin	Kanazawa C 31.119		Make an appointment in class

Course Objectives

	Keywords	Learning Objectives
1	Engineering Materials	Materials Engineering refers to the criteria and decisions behind the selection of the materials used in the design of mechanical parts. Students will learn about the chemical makeup of and its influence on the mechanical properties of each class of material. In addition, students will learn about basic fabrication and evaluation methods. Lastly, students will learn to consider the influence of each material in regard to modern society.
2	Crystal Structure	
3	Fracture	
4	Fabrication and Processing	
5	Metal, Ceramic, Polymer, Composite	

Course Description and Expectations for Students

This course will provide total-time credits. 45 50-minute study times are worth one credit, and students need to have 30 50-minute self-study times for 15 50-minute classes.

The progression of the course is as follows'

1. Overview of the 4 Basic Classifications of Materials used in Engineering and Industry
2. Introduction to Fracture Mechanisms
3. Introduction to common Fabrication and Processing Methods
4. Economic, Environmental, and Societal Issues in Materials Engineering

The majority of this course will be focused on processing and understanding ideas and concepts. Therefore, success in this class will depend on the students' ability to analyze information and draw conclusions.

This course will offer discovery learning and experiential learning in class as types of active learning.

Required Materials (textbooks, reference books, reserved books)

Textbooks: Fundamentals of Materials Science and Engineering: An Integrated Approach, International Adaptation, 6th Edition ISBN: 978-1119820543

Reference books:

Knowledge/Skills Needed to Take This Course (Prerequisites)

Knowledge of basic chemistry concepts (Periodic Table of Elements, Molecular Bonds)

No.	Program Objectives	Target Abilities for Students
①	h	Be able to categorize materials based on properties
②	h	Be able to analyze and determine mode of fracture for each class of material
③	h	Be able to select appropriate materials according to application
④	a, d	Be able to select appropriate fabrication and processing methods according to design requirements
⑤	b, h	Be able to connect concepts to applications in modern industry and society
⑥	a, g, i	Be able to extrapolate potential application for materials based on their properties

Evaluation Criteria

Criteria and Ratio \ Evaluation Method		Exams	Quizzes	Reports	Presentations	Works	Portfolios	Others	Total
Total Evaluation Ratio		35	30	35	0	0	0	0	100
Comprehensive Strength Criteria	Ability to capture knowledge	25	20	15	0	0	0	0	60
	Ability to think, reason and create	10	10	10	0	0	0	0	30
	Collaboration and leadership	0	0	0	0	0	0	0	0
	Announcement / Expression / Communication	0	0	0	0	0	0	0	0
	Attitude and motivation for learning	0	0	10	0	0	0	0	10

* The numerical breakdown shown by Comprehensive Strength Criteria is an approximate guideline for class management.

Evaluation Method

Evaluation Method	Target Ability		Evaluation Methods and Important Points
Exams	①	✓	There will be a final exam at the end of the semester that will test students on important vocabulary and terminology as well as the concepts regarding the materials that the students learned about throughout the semester.
	②	✓	
	③	✓	
	④	✓	
	⑤	✓	
	⑥	✓	
Quizzes	①	✓	There will be a short quiz every 2 weeks at the beginning of class about the contents of the previous two classes. For these quizzes, students are allowed to use their own homework that they have completed as reference material for the quiz. Students are not allowed to use their textbook, the internet, cellphones, class notes, or anyone else's notes. Makeup quizzes will not be given without a valid excuse.
	②	✓	
	③	✓	
	④	✓	
	⑤	✓	
	⑥	✓	
Reports	①	✓	There will be homework every week based on the concepts taught in class. Homework will be collected alongside the quizzes every two weeks. It is important that students understand what is being asked in each problem and their individual answer to those problems as they will be their reference materials for the quizzes. Furthermore, the contents of the homework will be connected to the following week's topics. Due to this, homework must be completed in a timely manner. Late homework will be accepted after their submission deadline at a -10% late penalty per school day up to a max of -50%. However, any homework that is copied will result in a 0.
	②	✓	
	③	✓	
	④	✓	
	⑤	✓	
	⑥	✓	
Presentations	①		
	②		
	③		
	④		
	⑤		
	⑥		
Works	①		
	②		
	③		
	④		
	⑤		
	⑥		
Portfolios	①		
	②		
	③		
	④		
	⑤		
	⑥		
Others	①		
	②		
	③		
	④		
	⑤		
	⑥		

Specific Achievement Criteria

Description of Ideal Achievement	Description of Standard Achievement
- Able to explain the properties attributed to the basic material types and subtypes. - Able to explain the cause of fracture and propose methods for prevention - Able to develop prospective applications of materials with valid supporting arguments - Able to propose fabrication methods based on desired specifications, budget, and environmental effects - Able to propose materials for use in real-world applications based on desired specifications - Able to explain the reason for the application of a material	- Able to identify general properties of the basic material types - Able to identify the mode of fracture of materials - Able to give a simple reason for using a material in an application - Able to identify the method of fabrication of material parts - Able to identify the type of material used in real-world applications - Able to identify the reason for the application of a material

Course Schedule

* In the "Time" column of the Assignments, the standard time required for the specified assignment is provided. For total-time credit courses, please take the time corresponding to each class for review and preview. (For example, in the case of a 2-credit course, please try to take 200 minutes per week.) Please follow the teacher's guidance for details.

Class No. Date	Class Content	Method	Assignments (Preview and Review)	Time (Minutes)
1 /	Guidance Students learn about the history of materials in engineering and about the 4 classes of materials used in modern industry.	Lecture	Review: (1) Read and understand the rules and regulations that are being applied to the course. (2) Read the relevant chapters.	200
2 /	Crystal Structure (1) Students learn about the differences in the crystal structure of each classification of material.	Lecture	Preview: Read Assigned Chapters Review: Complete Assignment	200
3 /	Crystal Structure (2) Students learn about the differences in the crystal structure of each classification of material.	Lecture	Preview: Read Assigned Chapters Review: Complete Assignment	200
4 /	Crystal Structure (3) Students learn about Phase Diagrams for metals and ceramics.	Lecture	Preview: Read Assigned Chapters Review: Complete Assignment	200
5 /	Crystal Structure (4) Students learn about how the crystal structure of each class of material affects their physical properties.	Lecture	Preview: Read Assigned Chapters Review: Complete Assignment	200
6 /	Material Evaluation Methods Students learn about how the properties of materials are evaluated.	Lecture	Preview: Read Assigned Chapters Review: Complete Assignment	200
7 /	Fracture Mechanisms (1) Students learn about the modes of fracture for each class of material.	Lecture	Preview: Read Assigned Chapters Review: Complete Assignment	200
8 /	Fracture Mechanisms (2) Students learn about the factors that can affect the mode of fracture for each material.	Lecture	Preview: Read Assigned Chapters Review: Complete Assignment	200
9 /	Types and Application of Materials Students learn about the different types and applications for each class of materials.	Lecture	Preview: Read Assigned Chapters Review: Complete Assignment	200
10 /	Fabrication and Processing (1) Students learn about common fabrication methods for metal materials.	Lecture	Preview: Read Assigned Chapters Review: Complete Assignment	200

Course Schedule

* In the "Time" column of the Assignments, the standard time required for the specified assignment is provided. For total-time credit courses, please take the time corresponding to each class for review and preview. (For example, in the case of a 2-credit course, please try to take 200 minutes per week.) Please follow the teacher's guidance for details.

Class No. Date	Class Content	Method	Assignments (Preview and Review)	Time (Minutes)
11 /	Fabrication and Processing (2) Students learn about common fabrication and processing methods for ceramic materials.	Lecture	Preview: Read Assigned Chapters Review: Complete Assignment	200
12 /	Fabrication and Processing (3) Students learn about common fabrication and processing methods for polymer materials.	Lecture	Preview: Read Assigned Chapters Review: Complete Assignment	200
13 /	Fabrication and Processing (4) Students learn about common fabrication and processing methods for composite materials.	Lecture	Preview: Read Assigned Chapters Review: Complete Assignment	200
14 /	Economic, Environmental, and Societal Issues in Materials Engineering (1) Students learn about the influence of materials on modern society.	Lecture	Preview: Read Assigned Chapters Review: Complete Assignment	200
15 /	Economic, Environmental, and Societal Issues in Materials Engineering (2) Students learn about the influence of materials on modern society.	Lecture	Preview: Read Assigned Chapters Review: Complete Assignment	200
16 /	Final Exam			
17 /	Final Exam Return			

2026 Syllabus

Instructor with "＊"means an instructor with company experience

Field	Course Name	Credits	Course Code	Semester	Class Style
Dept. S Specialized Mech. Elective	Thermal Engineering	2	540700	First	Lecture Total

Target Grade	Instructor	Office	E-mail Address	Office Hours
5	NAGANUMA, Kaname	44-203		Make an appointment in class

Course Objectives

	Keywords (10.5pt)	Learning Objectives (10.5pt)
1	Carnot Cycle	The goals of this course are to; (1) understand basic knowledge about the irreversibility in the nature. (2) learn how to convert energy and obtain work from heat. acquire design skills for energy conservation, effective utilization of energy resources, and energy conservation in mechanical engineering.
2	The Second Law of Thermodynamics	
3	Entropy, Exergy	
4	Real Gas	
5	Thermal Cycles	

Course Description and Expectations for Students (10.5pt)

This course will provide total-time credits. 45 50-minute study times are worth one credit, and students need to have 30 50-minute self-study times for 15 50-minute classes.

This course follows Thermodynamics. Thermodynamics mainly dealt with quantitative energy conservation by explaining thermal equilibrium and the 1st law of thermodynamics. Based on the knowledge of Thermodynamics, this class conducts the necessary skills and knowledge of thermal engineering needed to design actual thermal equipment. The class explains a qualitative evaluation of energy and effective utilization of energy resources based on the 2nd law of thermodynamics, the basic concepts of heat engines, and knowledge of vapor properties as an example of real gas. Significantly, this class covers the following topics:

(1) Thermal efficiency and Carnot cycle, (2) The 2nd law of thermodynamics, (3) Entropy, Exergy,
(4) Thermal characteristics of real gas, (5) Gas cycles

Students are expected to understand the meaning of terms and formulas. Students are expected to solve the exercises by yourself. Students should be aware of the instructor's explanation in class because the schedules of quizzes, tests, and reports may change as the class progresses. Students should not be absent from the class, as the handouts may not be received. Detailed schedules and course contents are explained in the first class.

Required Materials (textbooks, reference books, reserved books) (10.5pt)

Textbooks: Thermodynamics, English-Japanese Bilingual Textbook Series of Fundamental Engineering, Masataka Arai and Tomohiko Furuhata, Morikita Publishing.

Reference books: Technical Thermodynamics for Engineers -Basic and Applications-, Achim Schmidt, Springer.

Reserved books: N/A

Knowledge/Skills Needed to Take This Course (Prerequisites) (10.5pt)

Enough skill of mathematics (especially differential / integral calculations)
How to use a calculator

No.	Program Objectives	Target Abilities for Students (9pt)
①	g, h, i	Be able to explain the Carnot cycle and apply the knowledge to problems
②	g, h, i	Be able to explain the 2nd law of thermodynamics
③	g, h, i	Be able to explain entropy and exergy and apply the knowledge to problems
④	g, h, i	Be able to explain the characteristics of a real gas with phase change and apply the skills to problems
⑤	g, h, i	Be able to explain gas cycles and apply the knowledge to problems about the design of thermal equipment
⑥		

Evaluation Criteria

Criteria and Ratio \ Evaluation Method		Exams	Quizzes	Reports	Presentations	Works	Portfolios	Others	Total
Total Evaluation Ratio		0	70	30	0	0	0	0	100
Comprehensive Strength Criteria	Ability to capture knowledge	0	25	0	0	0	0	0	25
	Ability to think, reason and create	0	35	10	0	0	0	0	45
	Collaboration and leadership	0	0	0	0	0	0	0	0
	Announcement / Expression / Communication	0	0	10	0	0	0	0	10
	Attitude and motivation for learning	0	10	10	0	0	0	0	20

* The numerical breakdown shown by Comprehensive Strength Criteria is an approximate guideline for class management.

Evaluation Method

Evaluation Method	Target Ability		Evaluation Methods and Important Points (10.5pt)
Exams	①		
	②		
	③		
	④		
	⑤		
	⑥		
Quizzes	①	✓	Tests are conducted several times during class to confirm learning of the course content.
	②	✓	
	③	✓	
	④	✓	
	⑤	✓	
	⑥		
Reports	①	✓	Several reports need to be prepared as homework. The content of the reports includes previews and reviews of class topics.
	②	✓	
	③	✓	
	④	✓	
	⑤	✓	
	⑥		
Presentations	①		
	②		
	③		
	④		
	⑤		
	⑥		
Works	①		
	②		
	③		
	④		
	⑤		
	⑥		
Portfolios	①		
	②		
	③		
	④		
	⑤		
	⑥		
Others	①		
	②		
	③		
	④		
	⑤		
	⑥		

Specific Achievement Criteria

Description of Ideal Achievement (10.5pt)	Description of Standard Achievement (10.5pt)
(1) Explain the 2nd law of thermodynamics. Also, use this understanding to solve advanced problems related to thermal issues. (2) Explain Carnot cycle. Also, use this understanding to solve advanced problems related to thermal issues. (3) Explain a real gas and its characteristics. Also, use this understanding to solve advanced problems related to thermal issues. (4) Explain the various gas and vapor cycles with P-V and T-S diagrams. Also, evaluate the performance of thermal systems.	(1) Explain the 2nd law of thermodynamics. Also, use this understanding to solve basic problems related to thermal issues. (2) Explain Carnot cycle. Also, use this understanding to solve basic problems related to thermal issues. (3) Explain a real gas and its characteristics. Also, use this understanding to solve basic problems related to thermal issues. (4) Explain the various gas and vapor cycles with P-V and T-S diagrams. Also, evaluate the performance of thermal systems.

Course Schedule

* In the "Time" column of the Assignments, the standard time required for the specified assignment is provided. For total-time credit courses, please take the time corresponding to each class for review and preview. (For example, in the case of a 2-credit course, please try to take 200 minutes per week.) Please follow the teacher's guidance for details.

Class No. Date	Class Content (10pt)	Method (10pt)	Assignments (10pt) (Preview and Review)	Time (Minutes)
1 /	Introduction - Guidance for the course - Differences of Thermodynamics and Thermal Engineering Lecture: The 2nd law of Thermodynamics (1): - Concept of cycle - Thermal efficiency, Coefficient of performance (COP)	Lecture Self-check	Review the contents of Thermodynamics and prepare chpt. 12.1 and 12.3 on the textbook. Review	100 100
2 /	Lecture: The 2nd law of Thermodynamics (2): - Reversible and irreversible processes - Characteristics of Carnot cycle - Expression of the 2nd law of thermodynamics - Clausius' integral	Lecture Exercise Self-check	Prepare chpt. 9, 12.4, 13.1 - 13.4 on the textbook. Review	100 100
3 /	Lecture: The 2nd law of Thermodynamics (3): - Definition of Entropy - T-S diagram - Equations for entropy change	Lecture Exercise Self-check	Prepare chpt. 6, 7.1 – 2 on the textbook. Review	100 100
4 /	Lecture: The 2nd law of Thermodynamics (4): - Entropy change of ideal gas - Entropy change of liquids and solids	Lecture Exercise Self-check	Prepare chpt. 8 on the textbook. Review	100 100
5 /	Lecture: The 2nd law of Thermodynamics (5): - Exergy - Free energy Review of the 2nd law of Thermodynamics	Lecture Exercise Self-check	Prepare chpt. 6.4 and 13.6 on the textbook. Review	100 100
6 /	Test (1) : The 2nd law of thermodynamics	Test Self-check	Review the previous contents of the 2nd law of thermodynamics. Review	150 50
7 /	Lecture: Characteristics of real gas (1) - Difference of ideal gas and real gas - Phase change	Lecture Exercise Self-check	Prepare chpt. 3.1 and prepare chpt. 15.1 on the textbook. Review	100 100
8 /	Lecture: Characteristics of real gas (2) - van der Waal's equation of state - Wet saturated vapor	Lecture Exercise Self-check	Prepare chpt. 15.2 – 15.3 on the textbook. Review	100 100
9 /	Lecture: Characteristics of real gas (3) - Thermodynamic state change of water vapor - Example of calculation of characteristics of vapor Review of the characteristics of real gas	Lecture Exercise Self-check	Prepare chpt. 15.4 on the textbook. Review	100 100
10 /	Test (2) : Characteristics of real gas	Test Lecture Self-check	Review the previous contents of the characteristic of real gas. Review	150 50

Course Schedule

* In the "Time" column of the Assignments, the standard time required for the specified assignment is provided. For total-time credit courses, please take the time corresponding to each class for review and preview. (For example, in the case of a 2-credit course, please try to take 200 minutes per week.) Please follow the teacher's guidance for details.

Class No. Date	Class Content (10pt)	Method (10pt)	Assignments (10pt) (Preview and Review)	Time (Minutes)
11 /	Lecture: Gas cycles and their characteristics (1) - Internal combustion engine - Constant volume cycle	Lecture Exercise Self-check	Prepare chpt. 14.2 - 14.3 on the textbook. Review	100 100
12 /	Lecture: Gas cycles and their characteristics (2) - Constant pressure cycle - Sabathe cycle	Lecture Exercise Self-check	Prepare chpt. 14.4 - 14.5 on the textbook. Review	100 100
13 /	Lecture: Gas cycles and their characteristics (3) - Brayton cycle Review of the gas cycles	Lecture Exercise Self-check	Prepare chpt. 14.6 on the textbook. Review	100 100
14 /	Review (1) Whole quiz	Quiz Lecture Self-check	Review the previous contents Review the quiz	120 80
15 /	Review (2) Review of the whole contents of thermal engineering	Review Lecture Self-check	Review the previous contents	100 100

2026 Syllabus

Instructor with "*" means an instructor with company experience

Field	Course Name	Credits	Course Code	Semester	Class Style
Dept. S Specialized Mech. Required	Programming A	2	531400	First	Exercises Class

Target Grade	Instructor	Office	E-mail Address	Office Hours
5	FUJISAWA, Takeshi	KC 31-113-2		Thu 9:00-17:00

Course Objectives

Keywords (10.5pt)		Learning Objectives (10.5pt)
1	Data Type	The use of computers is a vital component of modern society. Continuing into the future, programs will continue to be developed to reduce various burdens in society. Understanding how those programs operate will allow engineers to operate and work more effectively. In this course, students will learn the basics of programming structures through the use of Python and how they apply to mechanical engineering.
2	Input/Output	
3	Conditional branch and Itration	
4	Function	
5	Python	

Course Description and Expectations for Students (10.5pt)

This course will offer experiential learning in class as a type of active learning.
This extensive 15-weeks course is meticulously designed to guide students through the fundamentals of Python programming to its advanced applications in various domains. The course begins with an introduction to Python, covering its setup, syntax, and basic programming concepts. As weeks progress, students will delve into more complex topics such as data structures, file handling, object-oriented programming.

Required Materials (textbooks, reference books, reserved books) (10.5pt)

Textbooks:
Reference books:
Reserved books:

Knowledge/Skills Needed to Take This Course (Prerequisites) (10.5pt)

Basic knowledge of computers

No.	Program Objectives	Target Abilities for Students (9pt)
①	h	Students will be able to apply existing knowledge about programming to learn a new programming language.
②	a,h	Students will be able to code a program with conditional branches and loops in Python.
③	a,h	Students will be able to code a program with data structures such as lists and dictionaries in Python.
④	a,h	Students will be able to code a program with Functions in Python..
⑤	a,h	Students will be able to code a program with Library in Python.
⑥	a,h,i	Students will be able to apply programming skills in the development of a simple data processing application.

Evaluation Criteria

Criteria and Ratio \ Evaluation Method		Exams	Quizzes	Reports	Presentations	Works	Portfolios	Others	Total
Total Evaluation Ratio		0	25	0	0	25	0	50	100
Comprehensive Strength Criteria	Ability to capture knowledge	0	10	0	0	10	0	10	30
	Ability to think, reason and create	0	10	0	0	10	0	10	30
	Collaboration and leadership	0	0	0	0	0	0	0	0
	Announcement / Expression / Communication	0	0	0	0	0	0	0	0
	Attitude and motivation for learning	0	5	0	0	5	0	30	40

* The numerical breakdown shown by Comprehensive Strength Criteria is an approximate guideline for class management.

Evaluation Method

Evaluation Method	Target Ability		Evaluation Methods and Important Points (10.5pt)
Exams	①		
	②		
	③		
	④		
	⑤		
	⑥		
Quizzes	①	✓	Check whether the students have acquired basic knowledge and skills about each unit they have studied. A quiz will be given to measure knowledge retention, focusing on the Tiny Quiz questions from the past.
	②	✓	
	③	✓	
	④	✓	
	⑤	✓	
	⑥		
Reports	①		.
	②		
	③		
	④		
	⑤		
	⑥		
Presentations	①		
	②		
	③		
	④		
	⑤		
	⑥		
Works	①	✓	Students will be evaluated about the knowledge and skills about creating a python program. Evaluation will be based on evaluation task and final project deliverables. Evaluation tasks account for 10% of the total evaluation and the final project accounts for 20% of the total evaluation。
	②	✓	
	③	✓	
	④	✓	
	⑤	✓	
	⑥	✓	
Portfolios	①		
	②		
	③		
	④		
	⑤		
	⑥		
Others	①	✓	Homework and exercises will be assigned as necessary to support self-study. Evaluation will be based on the content and submission of the assignments.
	②	✓	
	③	✓	
	④	✓	
	⑤	✓	
	⑥	✓	

Specific Achievement Criteria

Description of Ideal Achievement (10.5pt)	Description of Standard Achievement (10.5pt)
Students can understand the basic grammar of Python. Students can write a little complicated Python code with conditional branches, lists, dictionaries, functions and libraries. Students can explain, implement and analyze the simple data processing or classification.	Students can understand the basic grammar of Python. Students can write a simple Python code with conditional branches, lists, dictionaries, functions and libraries. Students are able to explain the simple flow of data processing or classification.

Course Schedule

* In the "Time" column of the Assignments, the standard time required for the specified assignment is provided. For total-time credit courses, please take the time corresponding to each class for review and preview. (For example, in the case of a 2-credit course, please try to take 200 minutes per week.) Please follow the teacher's guidance for details.

Class No. Date	Class Content (10pt)	Method (10pt)	Assignments (10pt) (Preview and Review)	Time (Minutes)
1	Overview of Python and environment setup Features of Python, its usage, etc. Building an environment	Lecture and Exercise	Read the lecture slides given and proceed with exercises.	20
2	Variable Basics Contents: Variable definitions, naming conventions	Lecture and Exercise	Read the lecture slides given and proceed with exercises.	20
3	Data Types (1): Integers and Floats Contents: Characteristics of `int` and `float`, basic operations	Lecture and Exercise	Read the lecture slides given and proceed with exercises.	20
4	Data Types (2): Strings and Booleans Contents: Basics of `str` (including string concatenation) and `bool	Lecture and Exercise	Read the lecture slides given and proceed with exercises.	20
5	Data type conversion Contents: Type conversion with `int()`, `str()`, etc., `type()` function	Lecture and Exercise	Read the lecture slides given and proceed with exercises.	20
6	Input and output (1) Contents: Basics of `input()` and `print()`, string formatting (f-string)	Lecture and Exercise	Read the lecture slides given and proceed with exercises.	20
7	Input and output (2) Contents: options for `print()` (sep, end), multi-line input	Lecture and Exercise	Read the lecture slides given and proceed with exercises.	20
8	Conditional Split (1): Basics of if statement Contents: Syntax of `if` and `else`, comparison operators	Lecture and Exercise	Read the lecture slides given and proceed with exercises.	20
9	Conditional Split (2): Multiple Conditions Contents: `elif`, logical operators (and, or, not)	Lecture and Exercise	Read the lecture slides given and proceed with exercises.	20
10	Exercise: Conditional Split Practice Contents: Problem solving using conditional branching	Lecture and Exercise	Read the lecture slides given and proceed with exercises.	20

Course Schedule

* In the "Time" column of the Assignments, the standard time required for the specified assignment is provided. For total-time credit courses, please take the time corresponding to each class for review and preview. (For example, in the case of a 2-credit course, please try to take 200 minutes per week.) Please follow the teacher's guidance for details.

Class No. Date	Class Content (10pt)	Method (10pt)	Assignments (10pt) (Preview and Review)	Time (Minutes)
11	Loop (1): Basics of the for statement Contents: `for` and `range()`, iterating over strings and lists	Lecture and Exercise	Read the lecture slides given and proceed with exercises.	20
12	Loop (2): Basics of while statement Contents: Syntax of `while`, `break` and `continue	Lecture and Exercise	Read the lecture slides given and proceed with exercises.	20
13	Exercise: Practice Looping Contents: Problem solving using loops	Lecture and Exercise	Read the lecture slides given and proceed with exercises.	20
14	Lists (1): Basic Operations Contents: Creating lists, indexing, slicing	Lecture and Exercise	Read the lecture slides given and proceed with exercises.	20
15	List (2): Methods and Its application Contents: `append()`, `remove()`, `sort()`, etc.	Lecture and Exercise	Read the lecture slides given and proceed with exercises.	20
16	evaluation task Content: Comprehensive evaluation of	Assignment Self-learning	Review the past 15 class slides and exercises.	30
17	Functions (1): Basics and definitions Contents: Function definition, arguments	Lecture and Exercise	Read the lecture slides given and proceed with exercises.	20
18	Functions (2): Its application and scope Contents: Default arguments, local/global variables	Lecture and Exercise	Read the lecture slides given and proceed with exercises.	20
19	Exercises: Practice with Functions Contents: Problem solving using functions	Lecture and Exercise	Read the lecture slides given and proceed with exercises.	20
20	Dictionaries (1): Basic Operations Contents: Creation of dictionaries, key/value operations	Lecture and Exercise	Read the lecture slides given and proceed with exercises.	20

Course Schedule

* In the "Time" column of the Assignments, the standard time required for the specified assignment is provided. For total-time credit courses, please take the time corresponding to each class for review and preview. (For example, in the case of a 2-credit course, please try to take 200 minutes per week.) Please follow the teacher's guidance for details.

Class No. Date	Class Content (10pt)	Method (10pt)	Assignments (10pt) (Preview and Review)	Time (Minutes)
21	Dictionary (2): Methods and Its applications Contents: `keys()`, `values()`, `get()`, etc.	Lecture and Exercise	Read the lecture slides given and proceed with exercises.	20
22	Tuples and Sets Contents: Tuple invariance, set de-duplication	Lecture and Exercise	Read the lecture slides given and proceed with exercises.	20
23	String Manipulation Applications Contents: `split()`, `join()`, regular expressions	Lecture and Exercise	Read the lecture slides given and proceed with exercises.	20
24	File I/O and CSV (1) Contents: Reading and writing files, `with` statement	Lecture and Exercise	Read the lecture slides given and proceed with exercises.	20
25	File I/O and CSV (2) Contents: Reading CSV, data processing	Lecture and Exercise	Read the lecture slides given and proceed with exercises.	20
26	Modules and Libraries Contents: Introduction to `math`, `random`, and external libraries	Lecture and Exercise	Read the lecture slides given and proceed with exercises.	20
27	Final project (1): Theme selection and design Contents: Definition of requirements and basic design of the program	Exercise	Read the lecture slides given and proceed with exercises.	20
28	Final project (2): Implementation Contents: Start coding, implement basic functionality	Exercise	Review the specifications and design documents you have created.	20
29	Final Project (3): Wrap-up Contents: Submission of deliverables, feedback, reflection	Exercise	Reflect on your own activities in the Final Project and identify learning challenges。	20
30	Quiz Content: Quiz to synthesize what you have learned so far	Quiz	Review the questions you got wrong in the quiz.	20

2026 Syllabus

Instructor with "＊" means an instructor with company experience

Field	Course Name	Credits	Course Code	Semester	Class Style
Dept. S Specialized Mech. Elective	Programming B	2	531500	Second	Exercises Class

Target Grade	Instructor	Office	E-mail Address	Office Hours
5	HAN, Justin	31.126		Make an appointment in class

Course Objectives

	Keywords	Learning Objectives
1	Numerical Analysis	Numerical analysis is commonly used to quantify real world phenomenon and create a mathematical model. Through the use of programs, engineers are able to expedite the creation of the model and reduce the probability of human error being incorporated in the model. Students in this course will learn how to use apply Python in order to perform simple numerical calculations.
2	Numerical Calculation Method	
3	Symbolic Computation	
4	Python	
5		

Course Description and Expectations for Students

This course will offer problem-based learning and discovery learning in class as types of active learning.
This course introduces the basics of applying Python to perform numerical analysis.

The progression of the course is as follows:

1. Application of NumPy arrays
2. Symbolic Calculation using SymPy
3. Plotting and Visualization using matplotlib
4. Regression, interpolation, and optimization using SciPy

Students are expected to bring their laptops to every class. In addition, topics are introduced and will build upon previous topics. Therefore, it is vital that assignments are completed on time.

Required Materials (textbooks, reference books, reserved books)
Textbooks:
Reference books:
Reserved books:

Knowledge/Skills Needed to Take This Course (Prerequisites)

- Basic knowledge of Python programming and matrix mathematics

No.	Program Objectives	Target Abilities for Students
①	g, h, i	Be able to use python to find numerical solutions to mathematical problems
②	g, h, i	Be able to use symbolic computation to find symbolic solutions to mathematical problems.
③	g, h, i	Be able to use python to create visual plots of data
④	g, h, i	Be able to use python to model systems of equations
⑤	g, h, i	Be able to use python to perform regression on experimental data
⑥	g, h, i	Be able to use python to perform interpolation on experimental data

Evaluation Criteria

Criteria and Ratio \ Evaluation Method		Exams	Quizzes	Reports	Presentations	Works	Portfolios	Others	Total
Total Evaluation Ratio		0	0	40	0	60	0	0	100
Comprehensive Strength Criteria	Ability to capture knowledge	0	0	10	0	25	0	0	35
	Ability to think, reason and create	0	0	10	0	20	0	0	30
	Collaboration and leadership	0	0	0	0	0	0	0	0
	Announcement / Expression / Communication	0	0	10	0	5	0	0	15
	Attitude and motivation for learning	0	0	10	0	10	0	0	20

* The numerical breakdown shown by Comprehensive Strength Criteria is an approximate guideline for class management.

Evaluation Method

Evaluation Method	Target Ability		Evaluation Methods and Important Points
Exams	①		
	②		
	③		
	④		
	⑤		
	⑥		
Quizzes	①		
	②		
	③		
	④		
	⑤		
	⑥		
Reports	①	✓	With the introduction of each new topic, there will be programming practices that we will work through during class together. Students are expected to document their understanding of the content.
	②	✓	
	③	✓	
	④	✓	
	⑤	✓	
	⑥	✓	
Presentations	①		
	②		
	③		
	④		
	⑤		
	⑥		
Works	①	✓	After the introductory exercises are completed, there will be specific problems provided. Time will be given during class. However, if these problems are not completed within the allotted time, students are expected to complete them outside of class. In addition, there will be a final comprehensive assignment where students will need to demonstrate their understanding of python numerical analysis.
	②	✓	
	③	✓	
	④	✓	
	⑤	✓	
	⑥	✓	
Portfolios	①		
	②		
	③		
	④		
	⑤		
	⑥		
Others	①		
	②		
	③		
	④		
	⑤		
	⑥		

Specific Achievement Criteria

Description of Ideal Achievement	Description of Standard Achievement
- Able to apply Python numerical analysis methods to solve real world problems. - Able to apply Python numerical analysis methods to create models of original experimental data	- Able to use Python to solve mathematical equations. - Able to use Python to create graphical representations of data.

Course Schedule

* In the "Time" column of the Assignments, the standard time required for the specified assignment is provided. For total-time credit courses, please take the time corresponding to each class for review and preview. (For example, in the case of a 2-credit course, please try to take 200 minutes per week.) Please follow the teacher's guidance for details.

Class No. Date	Class Content	Method	Assignments (Preview and Review)	Time (Minutes)
1 /	Guidance and Review Students learn about numerical analysis and review their understanding of Python.	Lecture	Review the concepts introduced in class.	50
2 /	Review Students review their understanding of Python.	Lecture	Review the concepts introduced in class.	50
3 /	Introduction to Numerical Analysis with Python Students learn how to perform basic mathematical calculations using Python.	Lecture	Review the concepts introduced in class.	50
4 /	Introduction to Numerical Analysis with Python Students learn how to perform basic mathematical calculations using Python.	Exercise	Complete the provided assignment.	50
5 /	Introduction to NumPy (1) Students learn about the basic applications of NumPy arrays.	Lecture	Review the concepts introduced in class.	50
6 /	Introduction to NumPy (2) Students learn about the basic applications of NumPy arrays.	Exercise	Complete the provided assignment.	50
7 /	Introduction to NumPy (3) Students learn about the basic applications of NumPy arrays.	Exercise	Complete the provided assignment.	50
8 /	Introduction to NumPy (4) Students learn about the basic applications of NumPy arrays.	Lecture	Review the concepts introduced in class.	50
9 /	Introduction to NumPy (5) Students learn about the basic applications of NumPy arrays.	Exercise	Complete the provided assignment.	50
10 /	Introduction to NumPy (6) Students learn about the basic applications of NumPy arrays.	Exercise	Complete the provided assignment.	50

Course Schedule

* In the "Time" column of the Assignments, the standard time required for the specified assignment is provided. For total-time credit courses, please take the time corresponding to each class for review and preview. (For example, in the case of a 2-credit course, please try to take 200 minutes per week.) Please follow the teacher's guidance for details.

Class No. Date	Class Content	Method	Assignments (Preview and Review)	Time (Minutes)
11 /	Introduction to SymPy (1) Students learn about the basic applications of SymPy symbols.	Lecture	Review the concepts introduced in class.	50
12 /	Introduction to SymPy (2) Students learn about the basic applications of SymPy symbols.	Exercise	Complete the provided assignment.	50
13 /	Introduction to SymPy (3) Students learn about the basic applications of SymPy symbols.	Exercise	Complete the provided assignment.	50
14 /	Introduction to SymPy (4) Students learn about the basic applications of SymPy symbols.	Lecture	Review the concepts introduced in class.	50
15 /	Introduction to SymPy (5) Students learn about the basic applications of SymPy symbols.	Exercise	Complete the provided assignment.	50
16 /	Introduction to SymPy (6) Students learn about the basic applications of SymPy symbols.	Exercise	Complete the provided assignment.	50
17 /	Plotting and Visualization (1) Students learn how to create data plots using matplotlib.	Lecture	Review the concepts introduced in class.	50
18 /	Plotting and Visualization (2) Students learn how to create data plots using matplotlib.	Exercise	Complete the provided assignment.	50
19 /	Importing and Exporting Data Files (1) Students learn how to import and export data files using Python.	Lecture	Review the concepts introduced in class.	50
20 /	Importing and Exporting Data Files (2) Students learn how to import and export data files using Python.	Exercise	Complete the provided assignment.	50

Course Schedule

* In the "Time" column of the Assignments, the standard time required for the specified assignment is provided. For total-time credit courses, please take the time corresponding to each class for review and preview. (For example, in the case of a 2-credit course, please try to take 200 minutes per week.) Please follow the teacher's guidance for details.

Class No. Date	Class Content (10pt)	Method (10pt)	Assignments (10pt) (Preview and Review)	Time (Minutes)
21 /	Introduction to Regression (1) Students learn how to perform regression analysis using NumPy.	Lecture	Review the concepts introduced in class.	50
22 /	Introduction to Regression (2) Students learn how to perform regression analysis using NumPy.	Exercise	Complete the provided assignment.	50
23 /	Introduction to Regression (3) Students learn how to perform regression analysis using NumPy.	Exercise	Complete the provided assignment.	50
24 /	Introduction to Interpolation (1) Students learn how to perform interpolation analysis using NumPy.	Lecture	Review the concepts introduced in class.	50
25 /	Introduction to Interpolation (2) Students learn how to perform interpolation analysis using NumPy.	Exercise	Complete the provided assignment.	50
26 /	Introduction to Interpolation (3) Students learn how to perform interpolation analysis using NumPy.	Exercise	Complete the provided assignment.	50
27 /	Comprehensive Assignment Students learn how to apply their knowledge of Python numerical analysis methods to complete a designated task.	Exercise	Complete the provided assignment.	50
28 /	Comprehensive Assignment Students learn how to apply their knowledge of Python numerical analysis methods to complete a designated task.	Exercise	Complete the provided assignment.	50
29 /	Comprehensive Assignment Students learn how to apply their knowledge of Python numerical analysis methods to complete a designated task.	Exercise	Complete the provided assignment.	50
30 /	Comprehensive Assignment Students learn how to apply their knowledge of Python numerical analysis methods to complete a designated task.	Exercise	Complete the provided assignment.	50

2026 Syllabus

Instructor with "*" means an instructor with company experience

Field	Course Name	Credits	Course Code	Semester	Class Style
Dept. S Specialized Info. Required	Information Mathematics III	2	550300	First	Lecture Total

Target Grade	Instructor	Office	E-mail Address	Office Hours
5	FUJISHIMA, Satoshi	Kanazawa C 31.116		Thu. 16:30 - 17:30

Course Objectives

Keywords (10.5pt)		Learning Objectives (10.5pt)
1	Scientific Calculation	Machine learning algorithms are very important techniques in data science and data mining, and it is necessary to use different algorithms according to the purpose and build an appropriate machine learning model. In this course, students will learn typical algorithms of machine learning through hand calculation and implementation in Python.
2	Numerical Analysis	
3	Machine Learning	
4	Classification	
5	Regression	

Course Description and Expectations for Students (10.5pt)

This course will provide total-time credits. 45 50-minute study times are worth one credit, and students need to have 30 50-minuite self-study times for 15 50-minute classes.

This course will offer students the opportunity to explain their answers to assignments and answer questions to deepen their understanding in class as a type of active learning.

This course introduces machine learning techniques, such as linear regression analysis, k-NN, Naive Bayes and Decision Tree. In addition, this course also introduces validation methods and correctness to evaluate the performance of machine learning models. Students will gain a deeper understanding of machine learning techniques through manual calculations and program implementation in Python.
- Have your laptop ready before class every time.
- Be sure to prepare sufficiently for class and the incoming topics in advance.
- Submit assignments on time.

Required Materials (textbooks, reference books, reserved books) (10.5pt)
Textbooks:
Reference books:
Reserved books:

Knowledge/Skills Needed to Take This Course (Prerequisites) (10.5pt)

No.	Program Objectives	Target Abilities for Students (9pt)
①	a,h,i	Students will be able to understand basics of scientific calculation methods and write simple programs using any of them.
②	a,i	Students will be able to explain the flow of machine learning process.
③	a,h,i	Students will be able to understand basics of classification methods and write simple programs using any of them.
④	a,h,i	Students will be able to understand basics of linear regression and write simple programs using any of them.
⑤	a,h,i	Students will be able to consider appropriate machine learning algorithms for each actual problem.
⑥		

Evaluation Criteria

Criteria and Ratio \ Evaluation Method		Exams	Quizzes	Reports	Presentations	Works	Portfolios	Others	Total
Total Evaluation Ratio		0	0	50	0	50	0	0	100
Comprehensive Strength Criteria	Ability to capture knowledge	0	0	15	0	20	0	0	35
	Ability to think, reason and create	0	0	15	0	20	0	0	35
	Collaboration and leadership	0	0	0	0	0	0	0	0
	Announcement / Expression / Communication	0	0	10	0	5	0	0	15
	Attitude and motivation for learning	0	0	10	0	5	0	0	15

* The numerical breakdown shown by Comprehensive Strength Criteria is an approximate guideline for class management.

Evaluation Method

Evaluation Method	Target Ability		Evaluation Methods and Important Points (10.5pt)
Exams	①		
	②		
	③		
	④		
	⑤		
	⑥		
Quizzes	①		
	②		
	③		
	④		
	⑤		
	⑥		
Reports	①	✓	Reports are worksheet exercises and written assignments for final project. The reports should be submitted by the due date designated by the instructors. All "Reports" assigned during class also serve as out-of-class learning assignments.
	②	✓	
	③	✓	
	④	✓	
	⑤	✓	
	⑥		
Presentations	①		
	②		
	③		
	④		
	⑤		
	⑥		
Works	①	✓	Works are programming exercise assignments assigned during class. The Python source code should be submitted by the due date designated by the instructors. All "Works" assigned during class also serve as out-of-class learning assignments.
	②	✓	
	③	✓	
	④	✓	
	⑤	✓	
	⑥		
Portfolios	①		
	②		
	③		
	④		
	⑤		
	⑥		
Others	①		
	②		
	③		
	④		
	⑤		
	⑥		

Specific Achievement Criteria

Description of Ideal Achievement (10.5pt)	Description of Standard Achievement (10.5pt)
Students are able to understand machine learning techniques and select an appropriate algorithm of them according to their purpose. Students are able to implement a program to build a machine learning model for data analysis (data mining).	Students are able to understand and explain simple flow of machine learning process. Students will be able to consider appropriate machine learning algorithms for each actual problem. Students are able to explain the simple flow of data processing or classification.

Course Schedule

* In the "Time" column of the Assignments, the standard time required for the specified assignment is provided. For total-time credit courses, please take the time corresponding to each class for review and preview. (For example, in the case of a 2-credit course, please try to take 200 minutes per week.) Please follow the teacher's guidance for details.

Class No. Date	Class Content (10pt)	Method (10pt)	Assignments (10pt) (Preview and Review)	Time (Minutes)
1 /	Guidance, Python Programming Environment, Machine Learning Outline Regression Analysis (1)	Lecture and Exercise	(Preview) Read the given lecture slides (Review, Assignment) Work on an assignment	200
2 /	Regression Analysis (2) Students will learn about simple regression analysis by manual calculation and Python coding.	Lecture and Exercise	(Preview) Read the given lecture slides (Review, Assignment) Work on an assignment	200
3 /	Regression Analysis (3) Students will learn about Python coding for simple regression analysis.	Exercise	(Preview) Read the given lecture slides (Review, Assignment) Work on an assignment	200
4 /	Regression Analysis (4) Students will learn about Python coding for simple regression analysis.	Exercise	(Preview) Read the given lecture slides (Review, Assignment) Work on an assignment	200
5 /	k-Nearest Neighbor (1) Students will learn about k-NN by manual calculation and Python coding.	Lecture and Exercise	(Preview) Read the given lecture slides (Review, Assignment) Work on an assignment	200
6 /	k-Nearest Neighbor (2) Students will learn about k-NN by manual calculation and Python coding.	Exercise	(Preview) Read the given lecture slides (Review, Assignment) Work on an assignment	200
7 /	k-Nearest Neighbor (3) Scaling Students will learn about Scaling methods and apply them to the k-NN with Python coding.	Lecture and Exercise	(Preview) Read the given lecture slides (Review, Assignment) Work on an assignment	200
8 /	Naive Bayes (1) Students will learn about Naive Bayes by hand calculation and Python coding.	Lecture and Exercise	(Preview) Read the given lecture slides (Review, Assignment) Work on an assignment	200
9 /	Naive Bayes (2) Students will learn about Python coding for Naive Bayes.	Exercise	(Preview) Read the given lecture slides (Review, Assignment) Work on an assignment	200
10 /	Decision Tree (1) Students will learn about Decision Tree by hand calculation and Python coding.	Lecture and Exercise	(Preview) Read the given lecture slides (Review, Assignment) Work on an assignment	200

Course Schedule

* In the "Time" column of the Assignments, the standard time required for the specified assignment is provided. For total-time credit courses, please take the time corresponding to each class for review and preview. (For example, in the case of a 2-credit course, please try to take 200 minutes per week.) Please follow the teacher's guidance for details.

Class No. Date	Class Content (10pt)	Method (10pt)	Assignments (10pt) (Preview and Review)	Time (Minutes)
11 /	Decision Tree (2) Students will learn about Python coding for Decision Tree.	Lecture and Exercise	(Preview) Read the given lecture slides (Review, Assignment) Work on an assignment	200
12 /	Validation Students will learn about Cross Validation and Python coding.	Exercise	(Preview) Read the given lecture slides (Review, Assignment) Work on an assignment	200
13 /	Correctness (1) Students will learn about Correctness of models and Python coding.	Lecture and Exercise	(Preview) Read the given lecture slides (Review, Assignment) Work on an assignment	200
14 /	Correctness (2) Students will learn about Correctness of models and Python coding.	Exercise	(Preview) Read the given lecture slides (Review, Assignment) Work on an assignment	200
15 /	Correctness (3) Students will learn about Correctness of models and Python coding.	Exercise	(Preview) Read the given lecture slides (Review, Assignment) Work on an assignment	200

2026 Syllabus

Instructor with "＊"means an instructor with company experience

Field	Course Name	Credits	Course Code	Semester	Class Style
Dept. S Specialized Info. Required * Practical	Database	2	550800	First	Lecture Total

Target Grade	Instructor	Office	E-mail Address	Office Hours
5	* FUJISAWA, Takeshi	Kanazawa C 31:113		Fri. 15:30 – 17:30

Course Objectives

Keywords		Learning Objectives
1	Relational Database	In today's advanced information society, the amount of data handled by information processing systems is enormous, and the growth of data volume is accelerating. The need for data scientists is increasing every year. This course provides an overview of databases, mainly relational databases, and how to write and operate SQL.
2	SQL	
3	Database normalization	
4	Relational Algebra	
5	Transaction	

Course Description and Expectations for Students

This will provide total-time credits. 45 50-minute study times are worth one credit, and students need to have 30 50-minute self-study times for 15 50-minute classes.
This course will offer Problem-solving and experiential learning in class as a type of active learning.

Learn the basics of data models and database management systems, focusing on relational databases. Students will learn the basics of data models and database management systems, focusing on relational databases. Assignments will be given to improve students' understanding and grasp of the content of the course. In the curriculum, this course aims to develop software development skills using databases. In the curriculum, this course aims to cultivate the ability to develop software using databases, and students should take this course with the mastery of SQL as a programming language in mind.

Relevance of practical experience to class subjects

Faculty members with practical experience in software development at major information companies and IT-related Internet venture companies will practice database design and database programming. In the programming exercises, they use database engines that are actually used in the real world, so that students can acquire practical and practical programming know-how based on their work experience.

Required Materials (textbooks, reference books, reserved books)
Textbooks: The Manga Guide to Databases (No Starch Press) ISBN 978-1-59327-190-9
Reference books: None
Reserved books: None

Knowledge/Skills Needed to Take This Course (Prerequisites)

Students should have the skills to install a relational database management system. In the first class, we will practice how to install the relational database management system and how to build the environment. Be sure to bring your textbook and notebook PC to each class.

No.	Program Objectives	Target Abilities for Students
①	i,h	Understand what the given SELECT statement is querying.
②	i,h	Can design a database and create tables.
③	i,h	Can transform from first normal form to third normal form
④	i,h	Can explain the difference between second normal form and third normal form
⑤	h	Can write programs that manipulate SQL.
⑥		

Evaluation Criteria

Criteria and Ratio \ Evaluation Method		Exams	Quizzes	Reports	Presentations	Works	Portfolios	Others	Total
Total Evaluation Ratio		55	0	0	0	30	0	15	100
Comprehensive Strength Criteria	Ability to capture knowledge	20	0	0	0	15	0	5	40
	Ability to think, reason and create	20	0	0	0	0	0	5	25
	Collaboration and leadership	0	0	0	0	0	0	0	0
	Announcement / Expression / Communication	0	0	0	0	0	0	0	0
	Attitude and motivation for learning	15	0	0	0	15	0	5	35

* The numerical breakdown shown by Comprehensive Strength Criteria is an approximate guideline for class management.

Evaluation Method

Evaluation Method	Target Ability		Evaluation Methods and Important Points
Exams	①	✓	Check whether the students have acquired basic knowledge and skills about each unit they have studied.
	②	✓	
	③	✓	
	④	✓	
	⑤	✓	
	⑥		
Quizzes	①		
	②		
	③		
	④		
	⑤		
	⑥		
Reports	①		
	②		
	③		
	④		
	⑤		
	⑥		
Presentations	①		
	②		
	③		
	④		
	⑤		
	⑥		
Works	①		Students will be evaluated about the knowledge and skills about creating a program to operate a database.
	②		
	③		
	④		
	⑤	✓	
	⑥		
Portfolios	①		
	②		
	③		
	④		
	⑤		
	⑥		
Others	①	✓	An assignment will be given to support self-study, and its validity will be assessed as the result of self-study done 30 times in 50 minutes.
	②	✓	
	③	✓	
	④	✓	
	⑤	✓	
	⑥		

Specific Achievement Criteria

Description of Ideal Achievement (10.5pt)	Description of Standard Achievement (10.5pt)
In addition to the standard achievement levels, the student should be able to (5) Can write complex SQL statements, including joins and subqueries (6) Can design a database that is correctly implemented up to the third normalization. (7) Can write programs to manipulate databases.	(1) Can explain what a relational data model is. (2) Can write SQL for a given relational algebra. (3) Represent the real world using the entity-relationship model, and translate the representation into a relational database schema. (4) Explain in detail the normalization procedure

Course Schedule

* In the "Time" column of the Assignments, the standard time required for the specified assignment is provided. For total-time credit courses, please take the time corresponding to each class for review and preview. (For example, in the case of a 2-credit course, please try to take 200 minutes per week.) Please follow the teacher's guidance for details.

Class No. Date	Class Content	Method	Assignments (Preview and Review)	Time (Minutes)
1 /	What is a database? Able to explain why a database is necessary.	Lecture	Read textbook and Assignment	200
2 /	What is a relational database? Able to explain what relational database is.	Lecture	Read textbook and Assignment	200
3 /	Relational Algebra Able to perform relational algebra operations.	Lecture	Read textbook and Assignment	200
4 /	Let's design a database Able to draw E-R model diagrams. Able to normalize non-normal form data to first normal form.	Lecture	Read textbook and Assignment	200
5 /	2nd Normal Form Able to normalize 1st normal form to 2nd one	Lecture	Read textbook and Assignment	200
6 /	3rd Normal Form Able to normalize 2nd normal form to 3rd one	Lecture Quiz	Read textbook and Assignment	200
7 /	SQL① Basic Of SQL	Lecture	Read textbook and Assignment	200
8 /	SQL② Able to make basic select SQL statement Able to create tables Able to insert, update or delete data rows	Lecture	Read textbook and Assignment	200
9 /	SQL③ Able to group data and extract data by using complex extraction conditions of SQL.	Lecture	Read textbook and Assignment	200
10 /	SQL④ Able to make complex SQL statement and join tables, Able to make SQL with subquery	Lecture Quiz	Read textbook and Assignment	200

Course Schedule

* In the "Time" column of the Assignments, the standard time required for the specified assignment is provided. For total-time credit courses, please take the time corresponding to each class for review and preview. (For example, in the case of a 2-credit course, please try to take 200 minutes per week.) Please follow the teacher's guidance for details.

Class No. Date	Class Content	Method	Assignments (Preview and Review)	Time (Minutes)
11 /	Let’s operate a database / Transaction. Able to explain ACID Able to perform SQL operations using transactions	Lecture	Read textbook and Assignment	200
12 /	Let’s operate a database / Transaction. why deadlock happens. When Disaster Strikes Indexes	Lecture Quiz	Read textbook and Assignment	200
13 /	DB programming ① Basic of a DB programming	Lecture	Read textbook and Assignment	200
14 /	DB programming ② Create a program to perform CRUD operations	Self-Study	Assignment of DB programming	200
15 /	DB programming ③ Create a program to perform CRUD operations	Self-Study	Assignment of DB programming	200
16 /	Final exam			
17 /	Review of final exam and assignment results Self-check Submit assignments			

2026 Syllabus

Instructor with "＊"means an instructor with company experience

Field	Course Name	Credits	Course Code	Semester	Class Style
Dept. S Specialized Info. Required	Software Engineering Lab	2	551100	First	Exercises Total

Target Grade	Instructor	Office	E-mail Address	Office Hours
5	SONGER, Robert	Kanazawa C: 31.115		Wed. 16:00 – 17:00

Course Objectives

Keywords (10.5pt)		Learning Objectives (10.5pt)
1	Software Engineering	Software Engineering is a practice-oriented discipline. This course provides students with hands-on experiences for efficiently developing object-oriented software products using software engineering techniques. In addition, students will have an opportunity to develop the necessary teamwork skills including leadership, collaboration, sharing responsibilities through roles, and continuous learning in a team-based computer graphics software project.
2	Computer Graphics	
3	Rendering	
4	Software Frameworks	
5	Team Development	

Course Description and Expectations for Students (10.5pt)

This course will provide total-time credits. 45 50-minute study times are worth one credit, and students need to have 30 50-minute self-study times for 15 50-minute classes. This course will offer regular programming exercises and a team project in class for active learning.

Students will have an opportunity to practice the software engineering techniques they learned in previous years and apply them to the domain of computer graphics. The course begins with teaching the basics of computer graphics (CG) through hands-on exercises that build a CG framework with Python and OpenGL. The students will then use their computer graphics frameworks to create a software application in a team development project

The class contents rely heavily on reading contents assigned every week, so it is important to **check the weekly reading assignments**. The teacher may apply a late penalty to your assignments if you are disruptive or do not participate in class activities.

NOTE: The textbook below is available for free at taylorfrancis.com and will also be available on the course home page.

Required Materials (textbooks, reference books, reserved books) (10.5pt)
Textbooks: "Developing Graphics Frameworks with Python and OpenGL" (CRC Press) ISBN 978-1-003-18137-8
Reference books: None
Reserved books: None

Knowledge/Skills Needed to Take This Course (Prerequisites) (10.5pt)

Students must be familiar with Object-Oriented Programming concepts and be able to set up a development environment for the Python programming language. They should also have a basic understanding of the software development lifecycle from conception to delivery, including the various activities involved in each step.

No.	Program Objectives	Target Abilities for Students (9pt)
①	h	Explain the steps of a typical computer graphics rendering pipeline
②	h, i	Understand the mathematical theory behind geometric transformations
③	a, h	Create a 3-dimensional scene using a computer graphics framework
④	b, g	Apply software engineering practices to the steps of a development project
⑤	c, d	Plan and execute a software development project as a team
⑥	e, f	Write code with the intention for others to use it

Evaluation Criteria

Criteria and Ratio \ Evaluation Method		Exams	Quizzes	Reports	Presentations	Works	Portfolios	Others	Total
Total Evaluation Ratio		0	10	30	0	30	30	0	100
Comprehensive Strength Criteria	Ability to capture knowledge	0	5	10	0	5	0	0	20
	Ability to think, reason and create	0	5	10	0	15	10	0	40
	Collaboration and leadership	0	0	0	0	0	10	0	10
	Announcement / Expression / Communication	0	0	10	0	0	5	0	15
	Attitude and motivation for learning	0	0	0	0	10	5	0	15

* The numerical breakdown shown by Comprehensive Strength Criteria is an approximate guideline for class management.

Evaluation Method

Evaluation Method	Target Ability		Evaluation Methods and Important Points (10.5pt)
Exams	①		
	②		
	③		
	④		
	⑤		
	⑥		
Quizzes	①	✓	There are two quizzes during the semester. Quizzes are short tests with simple answer type questions such as multiple-choice and fill-in-the-blanks. They allow the students to confirm their comprehension of recently covered content.
	②	✓	
	③		
	④		
	⑤		
	⑥		
Reports	①	✓	Reports are general assignments including handouts, written reports, and documents created during various in-class activities. Reports will be evaluated based on the accuracy of student responses in most cases; otherwise, they will be evaluated based on the amount of effort students put into their creation. In general, if a student submits one of these assignments late, **they will lose 20% of its maximum value towards their grade**.
	②	✓	
	③	✓	
	④		
	⑤		
	⑥		
Presentations	①		
	②		
	③		
	④		
	⑤		
	⑥		
Works	①	✓	Works are programming exercises assigned during class from the textbook or from the teacher. They give students a chance to apply what they learned to making a small program with an explicit purpose. In general, if a student submits one of these assignments late, **they will lose 20% of its maximum value towards their grade**.
	②	✓	
	③	✓	
	④		
	⑤		
	⑥		
Portfolios	①		The team development project at the end of the semester will count towards student portfolios. It will be graded based on completeness and demonstrated skill of its outcomes, including documents related to planning and managing the project.
	②		
	③	✓	
	④	✓	
	⑤	✓	
	⑥	✓	
Others	①		
	②		
	③		
	④		
	⑤		
	⑥		

Specific Achievement Criteria

Description of Ideal Achievement (10.5pt)	Description of Standard Achievement (10.5pt)
① Describe the steps of a computer graphics pipeline ② Explain transformations in terms of matrices and vectors ③ Create a 3D scene with a computer graphics framework ④ Apply software engineering to a development project ⑤ Plan the necessary steps for completing a project ⑥ Write code with comments that is easy to read and maintain	① Identify the steps of a computer graphics pipeline ② Identify transformations in terms of matrices and vectors ③ Apply functions to produce elements of a 3D scene ④ Explain techniques used in a development project ⑤ Follow the necessary steps for completing a project ⑥ Explain a program with comments in the source code

Course Schedule

* In the "Time" column of the Assignments, the standard time required for the specified assignment is provided. For total-time credit courses, please take the time corresponding to each class for review and preview. (For example, in the case of a 2-credit course, please try to take 200 minutes per week.) Please follow the teacher's guidance for details.

Class No. Date	Class Content (10pt)	Method (10pt)	Assignments (10pt) (Preview and Review)	Time (Minutes)
1 /	Guidance and Intro to Computer Graphics Get an overview of the course and the fundamentals of computer graphics rendering pipelines.	Lecture Discussion Exercises	The teacher will announce assignments in class.	200
2 /	CG Application Lifecycle Set up base components of a CG framework to link shaders and create a basic GPU program.	Lecture Discussion Exercises	The teacher will announce assignments in class.	200
3 /	Shapes and Colors Use single buffering and double buffering with a vertex shader to draw shapes and interpolate between color vertices.	Lecture Discussion Exercises	The teacher will announce assignments in class.	200
4 /	Animation and Interactivity Create moving shapes with integrated keyboard inputs.	Lecture Discussion Exercises	The teacher will announce assignments in class.	200
5 /	Vectors and Matrices Review the mathematical concepts of vectors, matrices, and their transformations.	Lecture Discussion Exercises	The teacher will announce assignments in class.	200
6 /	Geometric Transformations Derive the matrix formulas for 2D and 3D geometric transformations.	Lecture Discussion Exercises	The teacher will announce assignments in class.	200
7 /	Enter The Matrix Create a Matrix class and use it to demonstrate translation and rotation transformations.	Lecture Discussion Exercises Quiz	The teacher will announce assignments in class.	200
8 /	The Scene Graph Overview the scene graph and build the structure for a framework that can render 3D scenes.	Lecture Discussion Exercises	The teacher will announce assignments in class.	200
9 /	3D Scenes with Geometry and Material Objects Create classes to represent geometric shapes and their rendering properties, then render a 3D scene by putting together the pieces of the scene graph framework.	Lecture Discussion Exercises	The teacher will announce assignments in class.	200
10 /	Polygons, Planes, Spheres, and Cylinders Build a library of geometries for use in constructing complicated 3D scenes.	Lecture Discussion Exercises	The teacher will announce assignments in class.	200

Course Schedule

* In the "Time" column of the Assignments, the standard time required for the specified assignment is provided. For total-time credit courses, please take the time corresponding to each class for review and preview. (For example, in the case of a 2-credit course, please try to take 200 minutes per week.) Please follow the teacher's guidance for details.

Class No. Date	Class Content (10pt)	Method (10pt)	Assignments (10pt) (Preview and Review)	Time (Minutes)
11 /	Team Development Project (1) Choose a project theme as a team and plan its development.	Team Project	The teacher will announce assignments in class.	200
12 /	Team Development Project (2) Follow through on the team plan and execute the development.	Team Project	The teacher will announce assignments in class.	200
13 /	Team Development Project (3) Follow through on the team plan and execute the development.	Team Project	The teacher will announce assignments in class.	200
14 /	Team Development Project (4) Follow through on the team plan and execute the development.	Team Project	The teacher will announce assignments in class.	200
15 /	Team Development Project (5) Follow through on the team plan and execute the development.	Team Project	The teacher will announce assignments in class.	200

2026 Syllabus

Instructor with "*" means an instructor with company experience

Field	Course Name	Credits	Course Code	Semester	Class Style
Dept. S Specialized Info. Elective	Media Informatics	2	551300	First	Lecture Total

Target Grade	Instructor	Office	E-mail Address	Office Hours
5	OGAWA, Hayato	KC 31-115		Make an appointment in class

Course Objectives

Keywords (10.5pt)		Learning Objectives (10.5pt)
1	New Media	This course introduces Media Informatics, covering how digital media (text, images, audio, video) is created, processed, compressed, stored, and delivered. Students study media history and "new media," then connect these ideas to modern platforms such as telecom networks, mobile/AR, social media, AI/ML, cloud, IoT, and streaming, with a focus on codecs and compression under real-world constraints.
2	Compression	
3	Visual Codec	
4	Audio Codec	
5	Image compression	

Course Description and Expectations for Students (10.5pt)

This course will provide total-time credits. 45 50-minute study times are worth one credit, and students need to have 30 50-minuite self-study times for 15 50-minute classes.
This course will offer experiential learning in class as a type of active learning
In this Media Information class students will be introduced to Media history to current methods of interaction with media and importance effect of Media in the world. With information on the computer science aspect of distributing media with consideration to systems and hardware limitations.
Advice on taking this course:
- Have laptops or notebooks ready before class starts.
- Be sure to prepare sufficiently for class and the incoming topics in advance.
- Submit assignments on time.

Required Materials (textbooks, reference books, reserved books) (10.5pt)
Textbooks:
Reference books:
Reserved books:

Knowledge/Skills Needed to Take This Course (Prerequisites) (10.5pt)

Knowledge and experience learned and acquired so far in AI fundamentals, Programming class, Calculus classes.

No.	Program Objectives	Target Abilities for Students (9pt)
①	a,h	Students will be able to explain media evolution and "new media" and describe how media shapes society and communication.
②	a,h	Students will be able to key innovations in the history of Media.
③	a,h	Students will be able to implement correct formatting for image compression needs depending on hardware.
④	a,h	Students will be able to know the difference between different types of video compression formats.
⑤	a,h,i	Students will be able to know the way current audio media is consumed.
⑥		

Evaluation Criteria

Criteria and Ratio \ Evaluation Method		Exams	Quizzes	Reports	Presentations	Works	Portfolios	Others	Total
Total Evaluation Ratio		0	0	50	0	50	0	0	100
Comprehensive Strength Criteria	Ability to capture knowledge	0	0	20	0	20	0	0	40
	Ability to think, reason and create	0	0	0	0	10	0	0	10
	Collaboration and leadership	0	0	0	0	0	0	0	0
	Announcement / Expression / Communication	0	0	10	0	0	0	0	10
	Attitude and motivation for learning	0	0	20	0	20	0	0	40

* The numerical breakdown shown by Comprehensive Strength Criteria is an approximate guideline for class management.

Evaluation Method

Evaluation Method	Target Ability		Evaluation Methods and Important Points (10.5pt)
Exams	①		
	②		
	③		
	④		
	⑤		
	⑥		
Quizzes	①		
	②		
	③		
	④		
	⑤		
	⑥		
Reports	①	✓	In class activity exercises will be done on key topics. Students will involve a lot of hands-on exercises starting with programming and establishing a connection to microcontroller peripherals boards.
	②	✓	
	③	✓	
	④	✓	
	⑤	✓	
	⑥		
Presentations	①		
	②		
	③		
	④		
	⑤		
	⑥		
Works	①	✓	Students will be evaluated on their acquisition of knowledge with class review questions for homework.
	②	✓	
	③	✓	
	④	✓	
	⑤	✓	
	⑥		
Portfolios	①		
	②		
	③		
	④		
	⑤		
	⑥		
Others	①		
	②		
	③		
	④		
	⑤		
	⑥		

Specific Achievement Criteria

Description of Ideal Achievement (10.5pt)	Description of Standard Achievement (10.5pt)
Students can accurately explain core media informatics concepts (media pipeline, telecommunications basics, and platform delivery models) and justify technical decisions using evidence (e.g., bitrate/quality/latency constraints). Students can compare image, audio, and video codecs and compression methods, select suitable formats for a given device/network scenario, and communicate their analysis clearly in reports. They complete a media-focused project that demonstrates correct understanding of compression tradeoffs and system limitations, with well-organized documentation and appropriate citations.	By the end of the course, students can describe the basic history and current forms of media, outline the typical workflow of digital media delivery, and explain the purpose of compression and codecs. With guidance, they can choose reasonable media formats/settings for common situations (mobile, web, limited bandwidth) and summarize results in short reports. They participate in exercises, submit assignments on time, and complete a basic media-focused project that meets the minimum requirements.

Course Schedule

* In the "Time" column of the Assignments, the standard time required for the specified assignment is provided. For total-time credit courses, please take the time corresponding to each class for review and preview. (For example, in the case of a 2-credit course, please try to take 200 minutes per week.) Please follow the teacher's guidance for details.

Class No. Date	Class Content (10pt)	Method (10pt)	Assignments (10pt) (Preview and Review)	Time (Minutes)
1 /	Guidance Introduction to Media - What is Media - What is New Media	Lecture	Read the given lecture slides.	200
2 /	Telecommunications and mass media	Lecture Exercise	Read and answer questions reviewing the lecture	200
3 /	Data and processing	Lecture Exercise	Read and answer questions reviewing the lecture	200
4 /	Input output	Lecture Exercise	Read and answer questions reviewing the lecture	200
5 /	Smart phones Augmented reality	Lecture Exercise	Read and answer questions reviewing the lecture	200
6 /	Google	Lecture Exercise	Read and answer questions reviewing the lecture	200
7 /	AI and ML Meta and social Media News	Lecture Exercise	Read and answer questions reviewing the lecture	200
8 /	Startups + unicorn	Lecture Exercise	Read and answer questions reviewing the lecture	200
9 /	Cloud services and Amazon Big data	Lecture Exercise	Read and answer questions reviewing the lecture	200
10 /	Future IoT - Voice - Smart home	Lecture Exercise	Read and answer questions reviewing the lecture	200

Course Schedule

* In the "Time" column of the Assignments, the standard time required for the specified assignment is provided. For total-time credit courses, please take the time corresponding to each class for review and preview. (For example, in the case of a 2-credit course, please try to take 200 minutes per week.) Please follow the teacher's guidance for details.

Class No. Date	Class Content (10pt)	Method (10pt)	Assignments (10pt) (Preview and Review)	Time (Minutes)
11 /	Informatics of Images	Lecture Exercise	Read and answer questions reviewing the lecture	200
12 /	Image compression	Lecture Exercise In class activity	Read and answer questions reviewing the lecture	200
13 /	Informatics Video	Lecture Exercise	Read and answer questions reviewing the lecture	200
14 /	Video compression	Lecture Exercise In class activity	Read and answer questions reviewing the lecture	200
15 /	Audio visualization and compression	Lecture Exercise In class activity	Read and answer questions reviewing the lecture	200

2026 Syllabus

Instructor with "*" means an instructor with company experience

Field	Course Name	Credits	Course Code	Semester	Class Style
Dept. S Specialized Info. Elective	Operating System	2	551200	Second	Lecture Total

Target Grade	Instructor	Office	E-mail Address	Office Hours
5	FUJISAWA, Takeshi / SONGER, Robert	Kanazawa C 31.113		Friday 16:30-17:30

Course Objectives

Keywords		Learning Objectives
1	UNIX	Operating system (OS) is the system program that controls a computer system. OS provides an efficient interface for various programs to run on the computer. Nowadays, OS is familiar to computer users, however, the structure is black boxed. In this course, students will learn about the basic functions of the OS, such as process management, memory management, file management, etc., and obtain basic knowledge for creating programs that utilize OS.
2	Process Management	
3	File System	
4	Shell	
5	System Call Programming	

Course Description and Expectations for Students

This course will provide total-time credits. 45 50-minute study times are worth one credit, and students need to have 30 50-minute self-study times for 15 50-minute classes.
This course will offer Research and experiential learning in class as a type of active learning.

Learn about the basic components of an operating system and how to use them and gain an understanding of the elements and technologies necessary to realize an operating system. In this course, students will learn about the basic components of an operating system and how to use them. Specifically, the following topics will be covered.

1. Overview of Operating Systems
2. Process Management
3. File System
4. Shell (command interpreter)
5. UNIX System Programming

Required Materials (textbooks, reference books, reserved books)
Textbooks: None
Reference books: None
Reserved books "The UNIX programming environment" (Prentice Hall) ISBN 978-0-139-37681

Knowledge/Skills Needed to Take This Course (Prerequisites)

1. Basic hardware configuration and mechanism of computer systems.
2. Basic programming procedures.

No.	Program Objectives	Target Abilities for Students
①	e	To be able to work using basic UNIX commands
②	e	To be able to explain the basic functions of an operating system.
③	e	To be able to explain the differences between process and program.
④	e	To be able to explain the file system
⑤	e	To be able to write program codes using basic UNIX system calls
⑥		

Evaluation Criteria

Criteria and Ratio \ Evaluation Method		Exams	Quizzes	Reports	Presentations	Works	Portfolios	Others	Total
Total Evaluation Ratio		55	0	0	0	30	0	15	100
Comprehensive Strength Criteria	Ability to capture knowledge	25	0	0	0	10	0	5	40
	Ability to think, reason and create	20	0	0	0	10	0	5	35
	Collaboration and leadership	0	0	0	0	0	0	0	0
	Announcement / Expression / Communication	0	0	0	0	0	0	0	0
	Attitude and motivation for learning	10	0	0	0	10	0	5	25

* The numerical breakdown shown by Comprehensive Strength Criteria is an approximate guideline for class management.

Evaluation Method

Evaluation Method	Target Ability		Evaluation Methods and Important Points
Exams	①	✓	Check how much of basic knowledge and skills the students have acquired over the whole classes.
	②	✓	
	③	✓	
	④	✓	
	⑤	✓	
	⑥		
Quizzes	①		
	②		
	③		
	④		
	⑤		
	⑥		
Reports	①		
	②		
	③		
	④		
	⑤		
	⑥		
Presentations	①		
	②		
	③		
	④		
	⑤		
	⑥		
Works	①		Develop programming skills in C through the task of deciphering the source code of programs written in C. Students will deepen their understanding of the functions provided by the operating system through system call programming in the C language.
	②		
	③		
	④		
	⑤	✓	
	⑥		
Portfolios	①		
	②		
	③		
	④		
	⑤		
	⑥		
Others	①	✓	An assignment will be given to support self-study, and its validity will be assessed as the result of self-study done 30 times in 50 minutes.
	②	✓	
	③	✓	
	④	✓	
	⑤		
	⑥		

Specific Achievement Criteria

Description of Ideal Achievement	Description of Standard Achievement
Explain the nature of operating systems and process management. Understand the differences between processes and program. Write a program codes using basic UNIX system calls.	Explain the concepts and structure of the operating system, including processes and file systems.

Course Schedule

* In the "Time" column of the Assignments, the standard time required for the specified assignment is provided. For total-time credit courses, please take the time corresponding to each class for review and preview. (For example, in the case of a 2-credit course, please try to take 200 minutes per week.) Please follow the teacher's guidance for details.

Class No. Date	Class Content	Method	Assignments (Preview and Review)	Time (Minutes)
1 /	How an Operating System Works UNIX for Beginners Getting started Files and common commands	Lecture	Research about OS in advance	200
2 /	The File System (1) The basis of files	Lecture Exercises	Read handout and Assignment	200
3 /	The File System (2) Directories and filenames Permissions	Lecture Exercises	Read handout and Assignment	200
4 /	Standard input/output and process what is redirect and pipe? what is process?	Lecture Exercises Quiz	Read handout and Assignment	200
5 /	Basic commands (1)	Lecture Exercises	Read handout and Assignment	200
6 /	Basic commands (2)	Lecture Exercises	Read handout and Assignment	200
7 /	Basic commands (3)	Lecture Exercises Quiz	Read handout and Assignment	200
8 /	Using the Shell (1) Creating new commands Command arguments and parameters	Lecture Exercises	Read handout and Assignment	200
9 /	Using the Shell (2) Program output as arguments Shell variables Looping in shell programs	Lecture Exercises Quiz	Read handout and Assignment	200
10 /	C language Tutorial of C language	Lecture Exercises	Complete the assignment	200

Course Schedule

* In the "Time" column of the Assignments, the standard time required for the specified assignment is provided. For total-time credit courses, please take the time corresponding to each class for review and preview. (For example, in the case of a 2-credit course, please try to take 200 minutes per week.) Please follow the teacher's guidance for details.

Class No. Date	Class Content	Method	Assignments (Preview and Review)	Time (Minutes)
11 /	System Call Programming (1) Process	Lecture Exercises	Complete the assignment	200
12 /	System Call Programming (2) File input / output File System	Lecture Exercises	Complete the assignment	200
13 /	System Call Programming (3) Networking	Lecture Exercises	Complete the assignment	200
14 /	System Call Programming (4) Memory management Comprehensive Assignment	Lecture Exercises Self-Study	Complete the assignment	200
15 /	Wrap up Submit the assignment	Lecture Self-Study	Complete and submit the assignment	200
16	Final Exam			
17	Review of final exam results Self-check			

2026 Syllabus

Instructor with "*" means an instructor with company experience

Field	Course Name	Credits	Course Code	Semester	Class Style
Dept. S Specialized Info. Elective	Network Systems Lab	2	551400	Second	Exercises Total

Target Grade	Instructor	Office	E-mail Address	Office Hours
5	FUJISHIMA, Satoshi	Kanazawa C 31.116		Thu. 16:30 - 17:30

Course Objectives

	Keywords (10.5pt)	Learning Objectives (10.5pt)
1	Computer networks	This course introduces the knowledge and theory of TCP/IP protocols supporting the current Internet, and imparts various related communication technologies to students taking this course. Through this, students will gain an understanding of computer networks such as LAN and WAN to acquire basic skills related to network operations.
2	Protocols	
3	OSI reference model	
4	TCP/IP	
5	Internet	

Course Description and Expectations for Students (10.5pt)

This course will provide total-time credits. 45 50-minute study times are worth one credit, and students need to have 30 50-minuite self-study times for 15 50-minute classes.

Students will systematically learn the basic knowledge and theories related to computer networks as shown below.

1. Basic mechanisms of computer networks
2. OSI reference model and TCP/IP
3. Physical layer and datalink layer
4. Network layer and transport layer
5. Routing protocol and application layer

As part of the active learning approach, students will explain their answers to each assignment in class to deepen their understanding.

Required Materials (textbooks, reference books, reserved books) (10.5pt)

Textbooks:
Reference books:
Reserved books:

Knowledge/Skills Needed to Take This Course (Prerequisites) (10.5pt)

Basic knowledge of computers

No.	Program Objectives	Target Abilities for Students (9pt)
①	h,i	Students will be able to explain the basic mechanisms of computer networks.
②	h,i	Students will be able to explain the functions of each layer in the OSI reference model.
③	h,i	Students will be able to explain the functions of each layer in TCP/IP protocols.
④	h,i	Students will be able to explain the basic mechanisms of the Internet.
⑤	h,i	Students will be able to perform network diagnostics using basic network commands.
⑥	h,i	Students will be able to perform network diagnostics using basic network analyzation tools.

Evaluation Criteria

Criteria and Ratio \ Evaluation Method		Exams	Quizzes	Reports	Presentations	Works	Portfolios	Others	Total
Total Evaluation Ratio		0	10	40	0	50	0	0	100
Comprehensive Strength Criteria	Ability to capture knowledge	0	5	10	0	20	0	0	35
	Ability to think, reason and create	0	0	15	0	20	0	0	35
	Collaboration and leadership	0	0	0	0	0	0	0	0
	Announcement / Expression / Communication	0	0	10	0	5	0	0	15
	Attitude and motivation for learning	0	5	5	0	5	0	0	15

* The numerical breakdown shown by Comprehensive Strength Criteria is an approximate guideline for class management.

Evaluation Method

Evaluation Method	Target Ability		Evaluation Methods and Important Points (10.5pt)
Exams	①		
	②		
	③		
	④		
	⑤		
	⑥		
Quizzes	①	✓	There will be several quizzes to check the understanding of basic knowledge and theories related to computer networks.
	②	✓	
	③	✓	
	④	✓	
	⑤	✓	
	⑥	✓	
Reports	①	✓	Reports are worksheet assignments assigned during class. The reports should be submitted by the due date designated by the instructors. All “Reports” assigned during class also serve as out-of-class learning assignments.
	②	✓	
	③	✓	
	④	✓	
	⑤	✓	
	⑥	✓	
Presentations	①		
	②		
	③		
	④		
	⑤		
	⑥		
Works	①	✓	Works are Packet Tracer exercise assignments assigned during class. The Works should be submitted by the due date designated by the instructors. All “Works” assigned during class also serve as out-of-class learning assignments.
	②	✓	
	③	✓	
	④	✓	
	⑤	✓	
	⑥	✓	
Portfolios	①		
	②		
	③		
	④		
	⑤		
	⑥		
Others	①		
	②		
	③		
	④		
	⑤		
	⑥		

Specific Achievement Criteria

Description of Ideal Achievement (10.5pt)	Description of Standard Achievement (10.5pt)
Students are able to explain the following items systematically related to computer networks: 1. Basic information and communication systems 2. OSI reference model and TCP/IP model 3. Physical layer and datalink layer 4. Network layer and transport layer 5. Routing protocol and application layer Students are able to use appropriate network commands and tools for network maintenance and management.	Students are able to explain the basic contents of the following items related to computer networks: 1. Basic information and communication systems 2. OSI reference model and TCP/IP model 3. Physical layer and datalink layer 4. Network layer and transport layer 5. Routing protocol and application layer Students are able to use appropriate network commands and tools for basic network diagnostics

Course Schedule

* In the "Time" column of the Assignments, the standard time required for the specified assignment is provided. For total-time credit courses, please take the time corresponding to each class for review and preview. (For example, in the case of a 2-credit course, please try to take 200 minutes per week.) Please follow the teacher's guidance for details.

Class No. Date	Class Content (10pt)	Method (10pt)	Assignments (10pt) (Preview and Review)	Time (Minutes)
1 /	Guidance Fundamentals of Networking	Lecture and Exercise	(Preview) Read the given lecture slides (Review, Assignment) Work on an assignment	200
2 /	Basic Switch & End Device Configuration	Lecture and Exercise	(Preview) Read the given lecture slides (Review, Assignment) Work on an assignment	200
3 /	Basic Switch & End Device Configuration (2)	Lecture and Exercise	(Preview) Read the given lecture slides (Review, Assignment) Work on an assignment	200
4 /	Protocols & Models	Lecture and Exercise	(Preview) Read the given lecture slides (Review, Assignment) Work on an assignment	200
5 /	Wired & Wireless LAN	Lecture and Exercise	(Preview) Read the given lecture slides (Review, Assignment) Work on an assignment	200
6 /	Data Link Layer & Ethernet Switching	Lecture and Exercise	(Preview) Read the given lecture slides (Review, Assignment) Work on an assignment	200
7 /	Network Layer	Lecture and Exercise	(Preview) Read the given lecture slides (Review, Assignment) Work on an assignment	200
8 /	Address Resolution	Lecture and Exercise	(Preview) Read the given lecture slides (Review, Assignment) Work on an assignment	200
9 /	Basic Router Configuration	Lecture and Exercise	(Preview) Read the given lecture slides (Review, Assignment) Work on an assignment	200
10 /	IPv4 Addressing	Lecture and Exercise	(Preview) Read the given lecture slides (Review, Assignment) Work on an assignment	200

Course Schedule

* In the "Time" column of the Assignments, the standard time required for the specified assignment is provided. For total-time credit courses, please take the time corresponding to each class for review and preview. (For example, in the case of a 2-credit course, please try to take 200 minutes per week.) Please follow the teacher's guidance for details.

Class No. Date	Class Content (10pt)	Method (10pt)	Assignments (10pt) (Preview and Review)	Time (Minutes)
11 /	VLSM Addressing Quiz (1)	Lecture and Exercise	(Preview) Read the given lecture slides (Review, Assignment) Work on an assignment	200
12 /	VLSM Addressing (2) Quiz (2)	Exercise	(Preview) Read the given lecture slides (Review, Assignment) Work on an assignment	200
13 /	Transport Layer	Lecture and Exercise	(Preview) Read the given lecture slides (Review, Assignment) Work on an assignment	200
14 /	Application Layer	Lecture and Exercise	(Preview) Read the given lecture slides (Review, Assignment) Work on an assignment	200
15 /	Network Security	Lecture and Exercise	(Preview) Read the given lecture slides (Review, Assignment) Work on an assignment	200

2026 Syllabus

Instructor with "*" means an instructor with company experience

Field	Course Name	Credits	Course Code	Semester	Class Style
Dept. S Specialized Info. Required	Business Accounting	2	551600	First	Lecture Total

Target Grade	Instructor	Office	E-mail Address	Office Hours
5	STEVENSON, Ian	Hakusanroku C.: 101.201		Monday 16:30-17:30

Course Objectives

Keywords (10.5pt)		Learning Objectives (10.5pt)
1	Accounting procedure & principles	This course is for developing business, finance and accounting abilities in students. The goal is to learn accounting and the financial statements which review, report and analyze the business resultsto the stakeholders of the company, as well as the ability to understandthe actual management situation of the company through publicly available accounting information, such as statements, quarterly reports, etc..
2	Business simulation	
3	Financial statements	
4	Depreciation	
5	Management indicators	

Course Description and Expectations for Students (10.5pt)

This course will provide total time-credits. 45 50-minute study times are worth one credit, and students need to have 30 50-minute self-study times for 15 50-minute classes

This course will offer group work and discussion, problem solving, discovery and experiential learning as types of active learning.

This course introduces basic business and accounting principles to students. Students will practice and use these principles through a series of activities designed to strengthen and deepen student understanding of the material.

Required Materials (textbooks, reference books, reserved books) (10.5pt)

Textbooks:

Knowledge/Skills Needed to Take This Course (Prerequisites) (10.5pt)

An interest in international business, business management principles and their application.

No.	Program Objectives	Target Abilities for Students (9pt)
①	b,i	Students will be able to understand assets, liabilities, capital, income, and expenses, and list specific item names.
②	b,i	Students will be able to understand bookkeeping procedures (journaling, posting, closing, preparing financial statements).
③	b,i	Students will be able to create a balance sheet and give an overview of the information that it displays.
④	b,i	Students will be able to create a profit and loss statement and give an overview of the information that it displays.
⑤	b,i	Students will be able to read and understand financial reports.
⑥	b,i	Students will be able to understand and explain basic accounting principles.

Evaluation Criteria

Criteria and Ratio \ Evaluation Method		Exams	Quizzes	Reports	Presentations	Works	Portfolios	Others	Total
Total Evaluation Ratio		0	30	40	30	0	0	0	100
Comprehensive Strength Criteria	Ability to capture knowledge	0	6	8	6	0	0	0	20
	Ability to think, reason and create	0	6	8	6	0	0	0	20
	Collaboration and leadership	0	6	8	6	0	0	0	20
	Announcement / Expression / Communication	0	6	8	6	0	0	0	20
	Attitude and motivation for learning	0	6	8	6	0	0	0	20

* The numerical breakdown shown by Comprehensive Strength Criteria is an approximate guideline for class management.

Evaluation Method

Evaluation Method	Target Ability		Evaluation Methods and Important Points (10.5pt)
Exams	①		
	②		
	③		
	④		
	⑤		
	⑥		
Quizzes	①	レ	Students will be evaluated on a quiz / mid-term test.
	②	レ	
	③	レ	
	④	レ	
	⑤	レ	
	⑥	レ	
Reports	①	レ	Students will be evaluated on their assignments for each unit.
	②	レ	
	③	レ	
	④	レ	
	⑤	レ	
	⑥	レ	
Presentations	①	レ	Students will be evaluated on a final presentation.
	②	レ	
	③	レ	
	④	レ	
	⑤	レ	
	⑥	レ	
Works	①		
	②		
	③		
	④		
	⑤		
	⑥		
Portfolios	①		
	②		
	③		
	④		
	⑤		
	⑥		
Others	①		
	②		
	③		
	④		
	⑤		
	⑥		

Specific Achievement Criteria

Description of Ideal Achievement (10.5pt)	Description of Standard Achievement (10.5pt)
• Understand that accounting information is useful for making decisions for business owners and stakeholders. • Understand how accounting documents are created, what the data in those documents mean and complete the exercises. Be able to analyze financial statements and understand the business situation and problems of a company.	• Understand that accounting information is useful for making decisions for business owners and stakeholders. • Understand how accounting documents are created, what the data in those documents mean and complete the exercises. Be able to create financial statements.

Course Schedule

* In the "Time" column of the Assignments, the standard time required for the specified assignment is provided. For total-time credit courses, please take the time corresponding to each class for review and preview. (For example, in the case of a 2-credit course, please try to take 200 minutes per week.) Please follow the teacher's guidance for details.

Class No. Date	Class Content (10pt)	Method (10pt)	Assignments (10pt) (Preview and Review)	Time (Minutes)
1 /	Guidance About accounting / Business Simulation 1	Lecture Q&A Exercises	Review the handouts Finish the assignments	200
2 /	Business Simulation 2 Financial Statements - Balance Sheet 1	Lecture Q&A Exercises	Review the handouts Finish the assignments	200
3 /	Financial Statements - Balance Sheet 2	Lecture Q&A Exercises	Review the handouts Finish the assignments	200
4 /	Financial Statements – Income Statement 1	Lecture Q&A Exercises	Review the handouts Finish the assignments	200
5 /	Financial Statements – Income Statement 2	Lecture Q&A Exercises	Review the handouts Finish the assignments	200
6 /	Financial Statements – Cash Flow Statement 1	Lecture Q&A Exercises	Review the handouts Finish the assignments	200
7 /	Financial Statements – Cash Flow Statement 2	Lecture Q&A Exercises	Review the handouts Finish the assignments	200
8 /	Review for Quiz / Mid-term	Lecture Q&A Exercises	Review the handouts Finish the assignments Prepare for Quiz	200
9 /	Quiz / Mid-term	Lecture Q&A Exercises	Review the handouts Finish the assignments	200
10 /	Return & Review Quiz / Mid-term 10 K Reports 1	Lecture Q&A Exercises	Review the handouts Finish the assignments	200

Course Schedule

* In the "Time" column of the Assignments, the standard time required for the specified assignment is provided. For total-time credit courses, please take the time corresponding to each class for review and preview. (For example, in the case of a 2-credit course, please try to take 200 minutes per week.) Please follow the teacher's guidance for details.

Class No. Date	Class Content (10pt)	Method (10pt)	Assignments (10pt) (Preview and Review)	Time (Minutes)
11 /	10 K Reports 2	Lecture Q&A Exercises	Review the handouts Finish the assignments	200
12 /	Presentation - Preparation & Practice 1	Lecture Q&A Exercises	Review the handouts Finish the assignments Prepare / Practice for Final Presentation	200
13 /	Presentation - Preparation & Practice 2	Lecture Q&A Exercises	Review the handouts Finish the assignments Prepare / Practice for Final Presentation	200
14 /	Presentation - Preparation & Practice 3	Lecture Q&A Exercises	Review the handouts Finish the assignments Prepare / Practice for Final Presentation	200
15 /	Final Presentation	Lecture Q&A Exercises	Review the handouts Finish the assignments Prepare / Practice for Final Presentation	200

2026 Syllabus

Instructor with "＊"means an instructor with company experience

Field	Course Name	Credits	Course Code	Semester	Class Style
Dept. S Specialized Info. Elective * Practical	Advanced Topics in Business	2	551700	Second	Lecture Total

Target Grade	Instructor	Office	E-mail Address	Office Hours
5	* MEBUSAYA, Tossa MEBUSAYA, Rattiya	Kanazawa C: 31.114		Make an appointment in class

Course Objectives

	Keywords	Learning Objectives
1	Management	Explain basic terms and concepts such as management, strategy, marketing, customer, value, business, core competence, etc. and the relationship between the words. Basics for corporate activities, business management, and business strategies to be explained as the basic knowledge and tools such as useful technologies in engineering.
2	Strategy	
3	Market and customers	
4		
5		

Course Description and Expectations for Students

This course will provide total-time credits. 45 50-minute study times are worth one credit, and students need to have 30 50-minute self-study times for 15 50-minute classes. This course will offer problem-solving learning, investigative learning, and group discussion in class as a type of active learning. This course is a basic course for achieving success in management and business, which are the learning and educational goals. A wide range of knowledge and skills are used for business management and decision making, learning through example analysis, quizzes, and case study discussions. In particular, customers, stakeholders, competitive advantage would be understood as basic terms and concepts. This course will also be using BMC and Lean canvas as a guideline for students to understand the major key components of running business, and to aware of their impact to the business success and failure.

Relationship between this course and business experiences

Based on the teacher's experience in Startups and management in various industries, the teacher will provide discussion materials, case studies, lesson learned, and the key factors in business success and failure.

Required Materials (textbooks, reference books, reserved books)

None

Knowledge/Skills Needed to Take this Course (Prerequisites)

To understand corporate activity, corporate organization, management, strategy and marketing in corporate activities, is the basic objectives of this course. Please continually update on the necessity to collect, analyze and understand social examples and information of economic activities here and there. In this lecture, what to do if the student is a business owner? Since you will learn the basics of the countermeasures and you will have a sense of management of some business during active participation and discussion in this lecture.

No.	Program Objectives	Target Abilities for Students
①	a,b,c,d,e,f,g,h,i	Understand the company, its purpose, and organization.
②	a,b,c,d,e,f,g,h,i	Understand the basic knowledge of Management.
③	a,b,c,d,e,f,g,h,i	Understand the basic knowledge of Strategy.
④	a,b,c,d,e,f,g,h,i	Understand the basic knowledge of Market and customers.
⑤	a,b,c,d,e,f,g,h,i	Explain the framework necessary for applying the management strategy and organization.
⑥		

Evaluation Criteria

Evaluation Method / Criteria and Ratio		Exams	Quizzes	Reports	Presentations	Works	Portfolios	Others	Total
Total Evaluation Ratio		0	0	70	30	0	0	0	100
Comprehensive Strength Criteria	Ability to capture knowledge	0	0	20	10	0	0	0	30
	Ability to think, reason and create	0	0	20	10	0	0	0	30
	Collaboration and leadership	0	0	15	5	0	0	0	20
	Announcement / Expression / Communication	0	0	15	5	0	0	0	20
	Attitude and motivation for learning	0	0	0	0	0	0	0	0

* The numerical breakdown shown by Comprehensive Strength Criteria is an approximate guideline for class management.

Evaluation Method

Evaluation Method	Target Ability		Evaluation Methods and Important Points (10.5pt)
Exams	①		
	②		
	③		
	④		
	⑤		
	⑥		
Quizzes	①		
	②		
	③		
	④		
	⑤		
	⑥		
Reports	①	✓	Tasks, essays, final reports, etc. Guidelines and scopes are given, but the contents and composition can be freely set by students. Reports reflect class lessons and the business chosen by students. To support students' self-study, assignments will be given as both in- and out-of-class work, and the results will account for 70% of the overall evaluation
	②	✓	
	③	✓	
	④	✓	
	⑤	✓	
	⑥		
Presentations	①	✓	Presentations, oral presentations, presentation materials, performance, etc.
	②	✓	
	③	✓	
	④	✓	
	⑤	✓	
	⑥		
Works	①		
	②		
	③		
	④		
	⑤		
	⑥		
Portfolios	①		
	②		
	③		
	④		
	⑤		
	⑥		
Others	①		
	②		
	③		
	④		
	⑤		
	⑥		

Specific Achievement Criteria

Description of Ideal Achievement (10.5pt)	Description of Standard Achievement (10.5pt)
1. Explain the company, its purpose, and organization. 2. Explain the basic knowledge of Management. 3. Explain the basic knowledge of Strategy. 4. Explain the basic knowledge of Business model. 5. Implement the framework necessary for applying the management strategy and organization.	1. Understand the company, its purpose, and organization. 2. Understand the basic knowledge of Management. 3. Understand the basic knowledge of Strategy. 4. Understand the basic knowledge of Business model. 5. Understand the items necessary for thinking about management strategy and organization.

Course Schedule

* In the "Time" column of the Assignments, the standard time required for the specified assignment is provided. For total-time credit courses, please take the time corresponding to each class for review and preview. (For example, in the case of a 2-credit course, please try to take 200 minutes per week.) Please follow the teacher's guidance for details.

Class No. Date	Class Content (10pt)	Method (10pt)	Assignments (10pt) (Preview and Review)	Time (Minutes)
1 /	Orientation	Lecture with ppt. material, Discussion		200
2 /	Lectures and discussions on corporate activities and organizations. An introduction to Business plan, Business model canvas, and Lean canvas	Lecture with ppt. material, Discussion	Report 01: Pick a business and study its background and fundamentals	200
3 /	Lectures on Business plan, Business model canvas, and Lean canvas: Problem and Users.	Lecture with ppt. material, Discussion	Report 02: Analysis of business opportunity and its potential customer.	200
4 /	Lecture and Discussion on Market/User and Competitors	Lecture with ppt. material, Discussion		200
5 /	Lecture and Discussion on Business Analytic tools	Lecture with ppt. material, Discussion	Report 03: Analysis of business market and its competitors.	200
6 /	Lecture and discussion on Business Expense and Income	Lecture with ppt. material, Discussion	Report 04: Analysis of business expenses and startup cost.	200
7 /	Lecture and discussion on Business Key elements (Resources, Activities, Partners)	Lecture with ppt. material, Discussion		200
8 /	Lecture and discussion on Revenue model and Timeline, growth projection	Lecture with ppt. material, Discussion	Report 05: Analysis of business revenue model.	200
9 /	Lecture and discussion on Investment and funding options	Lecture with ppt. material, Discussion	Report 06: Analysis of business budget, funding, and timeline	200
10 /	Lecture and discussion on Business formalities, trademark, Copyright	Lecture with ppt. material, Discussion		200

Course Schedule

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Class No. Date	Class Content (10pt)	Method (10pt)	Assignments (10pt) (Preview and Review)	Time (Minutes)
11 /	Lecture and activities on designing your business identity. Business case study discussion.	Lecture with ppt. material, Discussion	Report 07: Business identity design	200
12 /	Case study - discussion	Lecture with ppt. material, Discussion		200
13 /	Case study and discussion: Doing business in AI era	Lecture with ppt. material, Discussion		200
14 /	Lecture and activities on Pitching technique, Business plan structure, finalize	Lecture with ppt. material, Discussion	Preparation: Review class materials and handouts. Prepare for presentation.	200
15 /	Final review and final Presentation	Presentation and lecture		200