令和６年度　学習支援計画書

「担当教員名」欄の＊＝実務経験のある教員

授業科目区分	科　目　名	単 位	科目コード	開講時期	授 業 形 態
国際理工学科 一般科目 選択	心理学	2	510600	前学期	講義／学修

対象学年	担当教員名	居室	電子メールＩＤ	オフィスアワー
5年	平　真由子	1・304		授業時予約

授 業 科 目 の 学 習 教 育 目 標

キーワード		学習教育目標
1	心理学の基礎知識	心理学は、個人的なものから社会的なものまで、様々なレベルの行動の背景にある「心」を科学的に理解しようとする分野である。技術者にとって、また社会人にとって、人間の行動を理解することは重要であり、心理学的な視点は自らのキャリア形成に非常に有効である。 本授業では、①自他の行動を心理学的な視点から理解し、人間に対する洞察力を涵養すること、②人の心に関する講義や討議で得た知識やスキルをもとに、自己成長につなげることを目標とする。
2	メンタルトレーニング	
3	自己理解	
4	他者理解	
5	自己成長	

授業の概要および学習上の助言

本講義は学修単位であるため、１単位を50分45回分の学習とし、50分授業15回に対して50分30回分の自学自習を行って下さい。
本科目では心理学について以下の項目を取り上げる。

＜取り上げるトピック＞
心理学の歴史、心と脳、感覚と知覚、動機づけの心理学、パフォーマンス発揮の心理学、記憶の心理学、性格の心理学
発達の心理学、社会や集団の心理学、心身の健康のための心理学

これらの各項目について、心理学の基礎的な概念や理論について説明する。さらに、演習やグループ討議を通して、その内容への理解を深め、自己理解、他者理解、自己成長につなげていく。
授業内で内容理解を深めるために、事前に予習を行うことを推奨する。予習の仕方については、第１回の講義で説明する。

評価については、各項目に関する講義の内容と基本的事項の理解を確認するために、小テストを3回、レポート課題2回、成果発表、授業内での演習の実施と振り返りの提出、および達成度確認テストを課す。また、欠席が全体の1/3以上になると成績を評価せずF判定（不合格）となる。

【教科書および参考書・リザーブドブック】
教科書：心理学概論[株式会社サイエンス社]
参考書：指定なし
ﾘｻﾞｰﾌﾞﾄﾞﾌﾞｯｸ：指定なし

履修に必要な予備知識や技能

・心理学に対する興味関心があり、教科書を事前に読んで、ある程度の予備知識を入れて受講することが望まれる。
・パワーポイントの作成、プレゼンテーション、グループディスカッションなどの演習も行うため、それらに関連する基本的なスキルを必要とする。
・授業を通して自己理解や他者理解を深めようとする態度、スキルアップを目指そうとする姿勢が望まれる。

No.	教育目標(DP) （記号表記）	学生が達成すべき行動目標
①	b, h, i	心理学の基礎用語をだいたい理解することができる。
②	b, h, i	心理学の基礎概念や理論について自分なりに説明することができる。
③	b, c, d, e, h, i	心理学の視点から、自他へ理解を深めることができる。
④	a, c, d, e, f, h, i	心理学の視点から自己や事例について思考し、文章やプレゼン等で説明することができる。
⑤	e, i	学生が達成すべき行動目標を自己評価できる。
⑥		

達　成　度　評　価

評価方法 指標と評価割合		試　験	クイズ 小テスト	レポート	成果発表 口頭・実技	作 品	ポートフォリオ	その他	合 計
総合評価割合		0	45	25	20	0	5	5	100
総合力指標	知識を取り込む力	0	33	5	5	0	0	0	43
	思考・推論・創造する力	0	12	15	5	0	0	0	32
	コラボレーションとリーダーシップ	0	0	0	0	0	0	0	0
	発表・表現・伝達する力	0	0	5	5	0	0	0	10
	学習に取組む姿勢・意欲	0	0	0	5	0	5	5	15

※総合力指標で示す数値内訳は、授業運営上のおおよその目安を示したものです。

評価の要点

評価方法	行動目標		評価の実施方法と注意点
試験	①		
	②		
	③		
	④		
	⑤		
	⑥		
クイズ 小テスト	①	レ	・小テストは3回実施（第4回、第8回、第11回の授業で実施）：複数の単元をまとめて試験範囲とし、授業の内容理解度を確認する。記号選択式問題とし、3回の合計点を15%に換算して最終評価に算入する。 ・達成度確認試験（第14回の授業で実施）：授業全体を試験範囲とし、授業の内容の理解度を確認する。記号選択式問題と記述式問題の混合型で出題する。得点を30%に換算して最終評価に算入する。
	②	レ	
	③		
	④		
	⑤	レ	
	⑥		
レポート	①	レ	・第5回の授業の中でレポートを作成し、提出する。レポート点を20%に換算し、最終評価に算入する。 ・第12回の特別講義を受講し、レポートを提出する。レポート点を5%に換算し、最終評価に算入する。
	②	レ	
	③	レ	
	④	レ	
	⑤		
	⑥		
成果発表 （口頭・実技）	①	レ	・第11回の授業で、各自、自分自身についてと興味のある心理学のトピックについてのプレゼンを行う。その際に使用した発表資料、発表の態度、振り返りも成果発表として評価する。
	②	レ	
	③	レ	
	④	レ	
	⑤		
	⑥		
作品	①		
	②		
	③		
	④		
	⑤		
	⑥		
ポートフォリオ	①		・達成すべき行動目標①～④についての自己評価と、その理由をポートフォリオ内に記述する。期限内に記述し提出する。5点満点で採点する。
	②		
	③		
	④		
	⑤	レ	
	⑥		
その他	①		・毎時間、テーマに合わせて自己の振り返りを入力して提出する。 ・演習の参加状況、授業態度について評価する。
	②		
	③	レ	
	④	レ	
	⑤	レ	
	⑥		

具体的な達成の目安

理想的な達成レベルの目安	標準的な達成レベルの目安
・心理学についての知識を獲得し、授業で取り上げたテーマについて、自ら説明することができる。 ・心理学に関する知識の獲得や、授業での演習を通して、自己理解、他者理解を深め、実際に役立てることができる。 ・心理学の概念や理論を生かして、個人や社会を理解し、新たなアイディアの創出につなげることができる。	・心理学についての知識を獲得し、授業で取り上げたテーマについて、ある程度説明することができる。 ・心理学に関する知識の獲得や、授業での演習を通して、自己理解、他者理解を深めることができる。 ・心理学の概念や理論を生かして、個人や社会を理解し、新たなアイディアの創出につなげたいという意欲を高めることができる。

授業明細表

ＣＬＩＰ学習プロセスについて

一般に、授業あるいは課外での学習では：**「知識などを取り込む」→「知識などをいろいろな角度から、場合によってはチーム活動として、考え、推論し、創造する」→「修得した内容を表現、発表、伝達する」→「総合的に評価を受ける、ＧｏｏｄＷｏｒｋ！」**：のようなプロセス（一部あるいは全体）を繰り返し行いながら、応用力のある知識やスキルを身につけていくことが重要です。このような学習プロセスを大事に行動ください。
※学習課題の時間欄には、指定された学習課題に要する標準的な時間を記載してあります。学修単位科目については、各授業に応じた時間（例えば2単位科目の場合、予習・復習で200分／週）を取るよう努めてください。詳しくは教員の指導に従って下さい。

回数 日付	学習内容	授業の運営方法	学習課題(予習・復習)	時間(分)
1 ／	・科目ガイダンス ・「心理学とは？」 心理学の特性について理解する。心理学について学習者が持つイメージや関心を明らかにする。 ・授業の振り返り（提出）とアンケート	講義、演習、質疑応答	【復習】 講義内容の振り返り	200
2 ／	・「心理学史」 心理学はいつ誕生し、どのように発展し、現在どうなっているのかを理解し、心理学の功績と課題について考える。 ・授業の振り返り（提出）	講義、演習、質疑応答	【予習】 第2章を読んで、大まかに内容を理解し、授業で深めたいことを明らかにしてくる。 【復習】講義、議論内容の振り返り	200
3 ／	・「感覚と知覚と心理学」 脳のはたらきと、感覚と知覚についての知識を獲得し、自己理解へとつなげる。 ・授業の振り返り（提出）	講義、演習、質疑応答	【予習】 第3章を読んで、大まかに内容を理解し、授業で深めたいことを明らかにしてくる。 【復習】第1回～第3回の講義、議論内容の復習	200
4 ／	・小テスト① ・「パフォーマンス発揮と心理学①」 パフォーマンス発揮に関する心理学の知識やスキルについての理解を深める。 ・授業の振り返り（提出）	小テスト、講義、演習、質疑応答	【予習】 これまでの自己のパフォーマンス発揮に関する記憶を整理する。 【復習】 講義、演習内容の復習	200
5 ／	・「パフォーマンス発揮と心理学②」 パフォーマンス発揮に関する知識やスキルについての理解をもとに、自己のパフォーマンス発揮に向けたメンタルトレーニングメニューを作成する。＊授業内でレポート提出	講義、レポート作成	【予習】 講義内容をもとに、自己の覚醒特性、効果的な方法についての分析を行う。	200
6 ／	・「記憶・学習と心理学」 記憶や学習に関する心理学の知見を理解し、自己の記憶や学習方法について振り返る。 ・授業の振り返り（提出）	講義、演習、質疑応答	【予習】 第4章5章を読んで、大まかに内容を理解し、授業で深めたいことを明らかにしてくる。 【復習】 講義、演習の内容の振り返り	200
7 ／	・「発達と心理学」 人間の発達についての理解を深め、発達において最も必要なものは何かについて議論する。 ・授業の振り返り（提出）	講義、演習、質疑応答	【予習】 教科書第8章を読んで、1シートに内容をまとめ、深めたいことを明らかにしておく。 【復習】 講義、演習の内容の振り返り	200
8 ／	・小テスト② ・「やる気と心理学」 やる気のメカニズムについて理解し、自身や他者のやる気を高める方法について考える。 ・授業の振り返り（提出）	小テスト、講義、演習、質疑応答	【予習】 教科書第7章を読んで、1シートに内容をまとめ、深めたいことを明らかにしておく。 【復習】 第4回～第7回の講義、演習の内容の復習	200
9 ／	・「性格と心理学」 性格に関わる心理学の知見を理解し、自己や他者の理解につなげる。 ・授業の振り返り（提出）	講義、演習、質疑応答	【予習】 性格やパーソナリティという用語やそれを関連する心理学の知見を収集しておく。 【復習】 講義、演習の内容の振り返り	200
10 ／	・「社会と心理学」 社会が人間の心理にどのような影響を与えているのか、また人間の心理が社会にどのような影響を与えているのかを考察する。 ・授業の振り返り（提出）	講義、演習、質疑応答	【予習】 教科書第9章を読んで、1シートに内容をまとめ、深めたいことを明らかにしておく。 【復習】 第8回～第10回の講義、演習内容の復習	200

授業明細表

ＣＬＩＰ学習プロセスについて

一般に、授業あるいは課外での学習では：**「知識などを取り込む」→「知識などをいろいろな角度から、場合によってはチーム活動として、考え、推論し、創造する」→「修得した内容を表現、発表、伝達する」→「総合的に評価を受ける、ＧｏｏｄＷｏｒｋ！」**：のようなプロセス（一部あるいは全体）を繰り返し行いながら、応用力のある知識やスキルを身につけていくことが重要です。このような学習プロセスを大事に行動ください。
※学習課題の時間欄には、指定された学習課題に要する標準的な時間を記載してあります。学修単位科目については、各授業に応じた時間（例えば2単位科目の場合、予習・復習で200分／週）を取るよう努めてください。詳しくは教員の指導に従って下さい。

回数 日付	学習内容	授業の運営方法	学習課題(予習・復習)	時間(分)
11 ／	・小テスト③ ・「自己理解・他者理解と心理学」 性格に関わる心理学の知見をもとに、他者に自分自身についてプレゼンする。また、他者のプレゼンを聞き、他者理解につなげる ・授業の振り返り（提出）	小テスト、資料作成、成果発表	【予習】 プレゼンの事前準備	200
12 ／	・「健康・臨床心理学」① 臨床現場で活躍する専門家から、実際の現場での話を聞き、学びを深める。 ・レポート作成（提出）	特別講義、演習、質疑応答	【予習】 特別講義の資料を事前に確認しておく 【復習】 講義や議論の内容の振り返りをもとにしたレポートの作成（提出）	200
13 ／	・「健康・臨床心理学」② 健康・臨床心理学について理解を深め、自己のストレスマネジメント力の向上につなげる。 ・授業の振り返り（提出）	講義、演習、質疑応答	【予習】 教科書第10章を読んで、1シートにまとめ、大まかに内容を理解し、深めたいことを明らかにしておく。 【復習】 第1回～第13回までの内容の復習	200
14 ／	・これまでの講義内容の確認 ・達成度確認試験（小テスト④）	質疑応答、小テスト④	【復習】 これまでの授業内容について振り返る。	200
15 ／	・自己分析シートの作成 ・総合議論 ・自己点検	演習、議論、自己点検	【復習】 今後の人生に授業での学びを援用する方法について考える。	200

2024 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 (a)	1	511300	First	Lecture Class

Target Grade	Instructor	Office	E-mail Address	Office Hours
5	REYNOLDS, Stephanie	Kanazawa C: 31.104		Monday 16:30-17:30

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. 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)

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 one reaction/response essay and prepare one collaborative, research-based presentation.

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:
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 a reaction/response essay.
④	c	Students will be able to make 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		Several vocabulary, 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 next class session.
	②	✓	
	③		
	④		
	⑤	✓	
	⑥		
Reports	①		One reaction/response essay (30%) Essay includes an outline, first draft, 2 writing conferences, and final draft. Feedback will be given during the next class session.
	②	✓	
	③	✓	
	④		
	⑤	✓	
	⑥	✓	
Presentations	①		One poster presentation/discussion project (30%) Project includes an outline, delivery & participation in discussion, and self-evaluation/reflection. Feedback will be given during the next class session.
	②	✓	
	③		
	④	✓	
	⑤	✓	
	⑥	✓	
Works	①		
	②		
	③		
	④		
	⑤		
	⑥		
Portfolios	①	✓	In-class or assignment handouts for preparation and review of discussion activities (20%) Feedback will be given during the next 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/Reading I 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 I – Part 1	50
2 /	Theme I: Bioethics (1) Students will review and discuss topics related to the reading or videos. Quiz 1	Individual, pair, and group work; discussion	Review: Complete the worksheet based on the class activities. Reading I – Part 2	50
3 /	Theme I: Bioethics (2) Students will review and discuss topics related to the reading or videos. Quiz 2	Individual, pair, and group work; discussion	Review: Complete the worksheet based on the class activities. Reading I – Part 3	50
4 /	Theme I: Bioethics (3) Students will review and discuss topics related to the reading or videos. Quiz 3	Individual, pair, and group work; discussion	Review: Complete the worksheet based on the class activities. Reading I – Part 4	50
5 /	Theme I: Bioethics (4) Students will review and discuss topics related to the reading or videos. Quiz 4	Individual, pair, and group work; discussion	Review: Complete the worksheet based on the class activities.	50
6 /	Reaction/Response Students will brainstorm ideas and opinions. Students will research related information to support their ideas and learn how to appropriately reference sources to write a reaction/response essay. *Outline Returned*	Individual, pair, and group work; discussion	Review: Complete Reaction/Response Essay Draft 1	50
7 /	Reaction/Response Students will brainstorm ideas and opinions. Students will research related information to support their ideas and learn how to appropriately reference sources to write a reaction/response essay. *Draft 1 Returned*	Individual, pair, and group work; discussion	Review: Complete Reaction/Response Essay Final Draft due Class 9	50
8 /	Reading II Students will participate in brainstorming and background building communication activities.	Individual, pair, and group work; discussion	Review: Complete the worksheet based on the class activities. Reading II – Part 1	50
9 /	Theme: Technology & Society (1) Students will review and discuss topics related to the reading or videos. Quiz 5	Individual, pair, and group work; discussion	Review: Complete the worksheet based on the class activities. Reading II – Part 2	50
10 /	Theme: Technology & Society (2) Students will review and discuss topics related to the reading or videos. Quiz 6	Individual, pair, and group work; discussion	Review: Complete the worksheet based on the class activities. Reading II – Part 3	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 /	Theme: Technology & Society (3) Students will review and discuss topics related to the reading or videos. *Reaction/Response Essay Returned* Quiz 7	Individual, pair, and group work; discussion	Review: Complete the worksheet based on the class activities. Reading II – Part 4	50
12 /	Theme: Technology & Society (4) Students will review and discuss topics related to the reading or videos. Quiz 8	Individual, pair, and group work; discussion	Review: Complete the worksheet based on the class activities. Reading II – Part 5	50
13 /	Poster Presentation/Discussion Preparation Students will brainstorm ideas and opinions. Students will research related information to support their ideas and learn how to appropriately reference sources to participate in a poster presentation/discussion.	Individual, pair, and group work; discussion	Review: Complete Presentation/Discussion Outline	50
14 /	Poster Presentation/Discussion Students will present and discuss ideas, opinions, and research related to the topic in a poster presentation/discussion. Students will complete a written reflection.	Individual, pair, and group work; discussion	Review: Complete written reflection	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 evaluation returned*	Individual, pair, and group work; discussion		

2024 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 (b)	1	511300	First	Lecture Class

Target Grade	Instructor	Office	E-mail Address	Office Hours
5	REYNOLDS, Stephanie	Kanazawa C: 31.104		Friday 15:00-17:00

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. 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)

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 one reaction/response essay and prepare one collaborative, research-based presentation.

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:
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 a reaction/response essay.
④	c	Students will be able to make 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		Several vocabulary, 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 next class session.
	②	✓	
	③		
	④		
	⑤	✓	
	⑥		
Reports	①		One reaction/response essay (30%) Essay includes an outline, first draft, 2 writing conferences, and final draft. Feedback will be given during the next class session.
	②	✓	
	③	✓	
	④		
	⑤	✓	
	⑥	✓	
Presentations	①		One poster presentation/discussion project (30%) Project includes an outline, delivery & participation in discussion, and self-evaluation/reflection. Feedback will be given during the next class session.
	②	✓	
	③		
	④	✓	
	⑤	✓	
	⑥	✓	
Works	①		
	②		
	③		
	④		
	⑤		
	⑥		
Portfolios	①	✓	In-class or assignment handouts for preparation and review of discussion activities (20%) Feedback will be given during the next 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/Reading I 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 I – Part 1	50
2 /	Theme I: Bioethics (1) Students will review and discuss topics related to the reading or videos. Quiz 1	Individual, pair, and group work; discussion	Review: Complete the worksheet based on the class activities. Reading I – Part 2	50
3 /	Theme I: Bioethics (2) Students will review and discuss topics related to the reading or videos. Quiz 2	Individual, pair, and group work; discussion	Review: Complete the worksheet based on the class activities. Reading I – Part 3	50
4 /	Theme I: Bioethics (3) Students will review and discuss topics related to the reading or videos. Quiz 3	Individual, pair, and group work; discussion	Review: Complete the worksheet based on the class activities. Reading I – Part 4	50
5 /	Theme I: Bioethics (4) Students will review and discuss topics related to the reading or videos. Quiz 4	Individual, pair, and group work; discussion	Review: Complete the worksheet based on the class activities.	50
6 /	Reaction/Response Students will brainstorm ideas and opinions. Students will research related information to support their ideas and learn how to appropriately reference sources to write a reaction/response essay. *Outline Returned*	Individual, pair, and group work; discussion	Review: Complete Reaction/Response Essay Draft 1	50
7 /	Reaction/Response Students will brainstorm ideas and opinions. Students will research related information to support their ideas and learn how to appropriately reference sources to write a reaction/response essay. *Draft 1 Returned*	Individual, pair, and group work; discussion	Review: Complete Reaction/Response Essay Final Draft due Class 9	50
8 /	Reading II Students will participate in brainstorming and background building communication activities.	Individual, pair, and group work; discussion	Review: Complete the worksheet based on the class activities. Reading II – Part 1	50
9 /	Theme: Technology & Society (1) Students will review and discuss topics related to the reading or videos. Quiz 5	Individual, pair, and group work; discussion	Review: Complete the worksheet based on the class activities. Reading II – Part 2	50
10 /	Theme: Technology & Society (2) Students will review and discuss topics related to the reading or videos. Quiz 6	Individual, pair, and group work; discussion	Review: Complete the worksheet based on the class activities. Reading II – Part 3	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 /	Theme: Technology & Society (3) Students will review and discuss topics related to the reading or videos. *Reaction/Response Essay Returned* Quiz 7	Individual, pair, and group work; discussion	Review: Complete the worksheet based on the class activities. Reading II – Part 4	50
12 /	Theme: Technology & Society (4) Students will review and discuss topics related to the reading or videos. Quiz 8	Individual, pair, and group work; discussion	Review: Complete the worksheet based on the class activities. Reading II – Part 5	50
13 /	Poster Presentation/Discussion Preparation Students will brainstorm ideas and opinions. Students will research related information to support their ideas and learn how to appropriately reference sources to participate in a poster presentation/discussion.	Individual, pair, and group work; discussion	Review: Complete Presentation/Discussion Outline	50
14 /	Poster Presentation/Discussion Students will present and discuss ideas, opinions, and research related to the topic in a poster presentation/discussion. Students will complete a written reflection.	Individual, pair, and group work; discussion	Review: Complete written reflection	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 evaluation returned*	Individual, pair, and group work; discussion		

2024 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 (c)	1	511300	First	Lecture Class

Target Grade	Instructor	Office	E-mail Address	Office Hours
5	UTSUNOMIYA, Takako	Kanazawa C: 31.104		Monday 15:00-17:00

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. 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)

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 one reaction/response essay and prepare one collaborative, research-based presentation.

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:
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 a reaction/response essay.
④	c	Students will be able to make 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		Several vocabulary, 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 next class session.
	②	✓	
	③		
	④		
	⑤	✓	
	⑥		
Reports	①		One reaction/response essay (30%) Essay includes an outline, first draft, 2 writing conferences, and final draft. Feedback will be given during the next class session.
	②	✓	
	③	✓	
	④		
	⑤	✓	
	⑥	✓	
Presentations	①		One poster presentation/discussion project (30%) Project includes an outline, delivery & participation in discussion, and self-evaluation/reflection. Feedback will be given during the next class session.
	②	✓	
	③		
	④	✓	
	⑤	✓	
	⑥	✓	
Works	①		
	②		
	③		
	④		
	⑤		
	⑥		
Portfolios	①	✓	In-class or assignment handouts for preparation and review of discussion activities (20%) Feedback will be given during the next 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)
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2 /	Theme I: Bioethics (1) Students will review and discuss topics related to the reading or videos. Quiz 1	Individual, pair, and group work; discussion	Review: Complete the worksheet based on the class activities. Reading I – Part 2	50
3 /	Theme I: Bioethics (2) Students will review and discuss topics related to the reading or videos. Quiz 2	Individual, pair, and group work; discussion	Review: Complete the worksheet based on the class activities. Reading I – Part 3	50
4 /	Theme I: Bioethics (3) Students will review and discuss topics related to the reading or videos. Quiz 3	Individual, pair, and group work; discussion	Review: Complete the worksheet based on the class activities. Reading I – Part 4	50
5 /	Theme I: Bioethics (4) Students will review and discuss topics related to the reading or videos. Quiz 4	Individual, pair, and group work; discussion	Review: Complete the worksheet based on the class activities.	50
6 /	Reaction/Response Students will brainstorm ideas and opinions. Students will research related information to support their ideas and learn how to appropriately reference sources to write a reaction/response essay. *Outline Returned*	Individual, pair, and group work; discussion	Review: Complete Reaction/Response Essay Draft 1	50
7 /	Reaction/Response Students will brainstorm ideas and opinions. Students will research related information to support their ideas and learn how to appropriately reference sources to write a reaction/response essay. *Draft 1 Returned*	Individual, pair, and group work; discussion	Review: Complete Reaction/Response Essay Final Draft due Class 9	50
8 /	Reading II Students will participate in brainstorming and background building communication activities.	Individual, pair, and group work; discussion	Review: Complete the worksheet based on the class activities. Reading II – Part 1	50
9 /	Theme: Technology & Society (1) Students will review and discuss topics related to the reading or videos. Quiz 5	Individual, pair, and group work; discussion	Review: Complete the worksheet based on the class activities. Reading II – Part 2	50
10 /	Theme: Technology & Society (2) Students will review and discuss topics related to the reading or videos. Quiz 6	Individual, pair, and group work; discussion	Review: Complete the worksheet based on the class activities. Reading II – Part 3	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 /	Theme: Technology & Society (3) Students will review and discuss topics related to the reading or videos. *Reaction/Response Essay Returned* Quiz 7	Individual, pair, and group work; discussion	Review: Complete the worksheet based on the class activities. Reading II – Part 4	50
12 /	Theme: Technology & Society (4) Students will review and discuss topics related to the reading or videos. Quiz 8	Individual, pair, and group work; discussion	Review: Complete the worksheet based on the class activities. Reading II – Part 5	50
13 /	Poster Presentation/Discussion Preparation Students will brainstorm ideas and opinions. Students will research related information to support their ideas and learn how to appropriately reference sources to participate in a poster presentation/discussion.	Individual, pair, and group work; discussion	Review: Complete Presentation/Discussion Outline	50
14 /	Poster Presentation/Discussion Students will present and discuss ideas, opinions, and research related to the topic in a poster presentation/discussion. Students will complete a written reflection.	Individual, pair, and group work; discussion	Review: Complete written reflection	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 evaluation returned*	Individual, pair, and group work; discussion		

2024 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 (a)	1	511400	Second	Lecture Class

Target Grade	Instructor	Office	E-mail Address	Office Hours
5	REYNOLDS, Stephanie	Kanazawa C: 31.104		Monday 16:30-17:30

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 related to the theory of knowledge. 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)

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 one reaction/response essay and prepare one collaborative, research-based presentation.

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: Van de Lagemaat, Richard. (2015). Theory of Knowledge for the IB Diploma, 2nd Ed. Cambridge.
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 a reaction/response essay.
④	c	Students will be able to make 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		Several vocabulary, written response, reading/listening comprehension, and/or review assessments based on the content of in-class activities and assignments (20%) Feedback will be given in the next class session.
	②	✓	
	③		
	④		
	⑤	✓	
	⑥		
Reports	①		One reaction/response essay (30%) Essay includes an outline, first draft, 2 writing conferences, and final draft. Feedback will be given in the next class session.
	②	✓	
	③	✓	
	④		
	⑤	✓	
	⑥	✓	
Presentations	①		One jigsaw presentation project (30%) Project includes an outline, delivery of presentation, preparation of supplementary materials, and self-evaluation/reflection. Feedback will be given in the next class session.
	②	✓	
	③		
	④	✓	
	⑤	✓	
	⑥	✓	
Works	①		
	②		
	③		
	④		
	⑤		
	⑥		
Portfolios	①	✓	In-class or assignment handouts for preparation and review of discussion activities (20%) Feedback will be given in the next 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 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 – Various articles, book/web resources	50
2 /	Students will review and discuss topics related to the theme. Theme: Cultural perspectives on knowledge 1 Quiz 1	Individual, pair, and group work; discussion	Review: Complete the worksheet based on the class activities. Reading – Various articles, book/web resources	50
3 /	Students will review and discuss topics related to the theme. Theme: Cultural perspectives on knowledge 2 Quiz 2	Individual, pair, and group work; discussion	Review: Complete the worksheet based on the class activities. Reading – Various articles, book/web resources	50
4 /	Students will review and discuss topics related to the theme. Theme: Cultural perspectives on knowledge 3 Quiz 3	Individual, pair, and group work; discussion	Review: Complete the worksheet based on the class activities. Reading – Various articles, book/web resources	50
5 /	Students will review and discuss topics related to the theme. Theme: Cultural perspectives on knowledge 4 Quiz 4	Individual, pair, and group work; discussion	Review: Complete the worksheet based on the class activities. Reading – Various articles, book/web resources	50
6 /	Students will review, discuss, and brainstorm ideas and opinions. Students will research related information to support their ideas. Theme: Cultural perspectives on knowledge 5 Quiz 5	Individual, pair, and group work; discussion	Review: Complete outline and Reaction/Response Essay Draft 1	50
7 /	Students will brainstorm ideas and opinions. Students will research and learn how to appropriately reference sources to write a reaction/response essay.	Individual, pair, and group work; discussion	Review: Complete Reaction/Response Essay Final Draft due Class 9	50
8 /	Students will participate in writing conferences. Students will create teams, choose topics, and participate in brainstorming and background building communication activities.	Individual, pair, and group work; discussion	Review: Complete the worksheet based on the class activities. Reading – Various articles, book/web resources	50
9 /	Students will research information related to their topic and learn how to appropriately reference sources for a presentation. Theme: Areas of Knowledge	Individual, pair, and group work; discussion	Review: Start presentation outline	50
10 /	Students will continue to research and organize presentation contents. Theme: Areas of Knowledge	Individual, pair, and group work; discussion	Review: Complete presentation outline	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 /	Students will prepare presentation slides and supplementary materials for their presentation. Theme: Areas of Knowledge *Reaction/Response Essay Returned*	Individual, pair, and group work; discussion	Review: Complete presentation slides and supplemental materials Reading – Various articles, book/web resources	50
12 /	Jigsaw Presentation/Discussion Theme: Math, Natural science, Human science Students will deliver presentations and lead discussions/activities based on supplemental materials connected to their topic of research. Quiz 6	Individual, pair, and group work; discussion	Review: Complete the worksheet based on the class activities. Reading – Various articles, book/web resources	50
13 /	Jigsaw Presentation/Discussion Theme: Arts, History, Ethics Students will deliver presentations and lead discussions/activities based on supplemental materials connected to their topic of research. Quiz 7	Individual, pair, and group work; discussion	Review: Complete the worksheet based on the class activities. Reading – Various articles, book/web resources	50
14 /	Jigsaw Presentation/Discussion Theme: Religious and Indigenous knowledge Students will deliver presentations and lead discussions/activities based on supplemental materials connected to their topic of research. Quiz 8	Individual, pair, and group work; discussion	Review: Complete the worksheet based on the class activities. Review: Complete written reflection	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/Discussion Project Returned*	Individual, pair, and group work; discussion		

2024 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 (b)	1	511400	Second	Lecture Class

Target Grade	Instructor	Office	E-mail Address	Office Hours
5	REYNOLDS, Stephanie	Kanazawa C: 31.104		Monday 16:30-17:30

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 related to the theory of knowledge. 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)

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 one reaction/response essay and prepare one collaborative, research-based presentation.

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: Van de Lagemaat, Richard. (2015). Theory of Knowledge for the IB Diploma, 2nd Ed. Cambridge.
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 a reaction/response essay.
④	c	Students will be able to make 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		Several vocabulary, written response, reading/listening comprehension, and/or review assessments based on the content of in-class activities and assignments (20%) Feedback will be given in the next class session.
	②	✓	
	③		
	④		
	⑤	✓	
	⑥		
Reports	①		One reaction/response essay (30%) Essay includes an outline, first draft, 2 writing conferences, and final draft. Feedback will be given in the next class session.
	②	✓	
	③	✓	
	④		
	⑤	✓	
	⑥	✓	
Presentations	①		One jigsaw presentation project (30%) Project includes an outline, delivery of presentation, preparation of supplementary materials, and self-evaluation/reflection. Feedback will be given in the next class session.
	②	✓	
	③		
	④	✓	
	⑤	✓	
	⑥	✓	
Works	①		
	②		
	③		
	④		
	⑤		
	⑥		
Portfolios	①	✓	In-class or assignment handouts for preparation and review of discussion activities (20%) Feedback will be given in the next 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 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 – Various articles, book/web resources	50
2 /	Students will review and discuss topics related to the theme. Theme: Cultural perspectives on knowledge 1 Quiz 1	Individual, pair, and group work; discussion	Review: Complete the worksheet based on the class activities. Reading – Various articles, book/web resources	50
3 /	Students will review and discuss topics related to the theme. Theme: Cultural perspectives on knowledge 2 Quiz 2	Individual, pair, and group work; discussion	Review: Complete the worksheet based on the class activities. Reading – Various articles, book/web resources	50
4 /	Students will review and discuss topics related to the theme. Theme: Cultural perspectives on knowledge 3 Quiz 3	Individual, pair, and group work; discussion	Review: Complete the worksheet based on the class activities. Reading – Various articles, book/web resources	50
5 /	Students will review and discuss topics related to the theme. Theme: Cultural perspectives on knowledge 4 Quiz 4	Individual, pair, and group work; discussion	Review: Complete the worksheet based on the class activities. Reading – Various articles, book/web resources	50
6 /	Students will review, discuss, and brainstorm ideas and opinions. Students will research related information to support their ideas. Theme: Cultural perspectives on knowledge 5 Quiz 5	Individual, pair, and group work; discussion	Review: Complete outline and Reaction/Response Essay Draft 1	50
7 /	Students will brainstorm ideas and opinions. Students will research and learn how to appropriately reference sources to write a reaction/response essay.	Individual, pair, and group work; discussion	Review: Complete Reaction/Response Essay Final Draft due Class 9	50
8 /	Students will participate in writing conferences. Students will create teams, choose topics, and participate in brainstorming and background building communication activities.	Individual, pair, and group work; discussion	Review: Complete the worksheet based on the class activities. Reading – Various articles, book/web resources	50
9 /	Students will research information related to their topic and learn how to appropriately reference sources for a presentation. Theme: Areas of Knowledge	Individual, pair, and group work; discussion	Review: Start presentation outline	50
10 /	Students will continue to research and organize presentation contents. Theme: Areas of Knowledge	Individual, pair, and group work; discussion	Review: Complete presentation outline	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 /	Students will prepare presentation slides and supplementary materials for their presentation. Theme: Areas of Knowledge *Reaction/Response Essay Returned*	Individual, pair, and group work; discussion	Review: Complete presentation slides and supplemental materials Reading – Various articles, book/web resources	50
12 /	Jigsaw Presentation/Discussion Theme: Math, Natural science, Human science Students will deliver presentations and lead discussions/activities based on supplemental materials connected to their topic of research. Quiz 6	Individual, pair, and group work; discussion	Review: Complete the worksheet based on the class activities. Reading – Various articles, book/web resources	50
13 /	Jigsaw Presentation/Discussion Theme: Arts, History, Ethics Students will deliver presentations and lead discussions/activities based on supplemental materials connected to their topic of research. Quiz 7	Individual, pair, and group work; discussion	Review: Complete the worksheet based on the class activities. Reading – Various articles, book/web resources	50
14 /	Jigsaw Presentation/Discussion Theme: Religious and Indigenous knowledge Students will deliver presentations and lead discussions/activities based on supplemental materials connected to their topic of research. Quiz 8	Individual, pair, and group work; discussion	Review: Complete the worksheet based on the class activities. Review: Complete written reflection	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/Discussion Project Returned*	Individual, pair, and group work; discussion		

2024 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 (c)	1	511400	Second	Lecture Class

Target Grade	Instructor	Office	E-mail Address	Office Hours
5	UTSUNOMIYA, Takako	Kanazawa C: 31.104		Monday 15:00-17:00

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 related to the theory of knowledge. 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)

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 one reaction/response essay and prepare one collaborative, research-based presentation.

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: Van de Lagemaat, Richard. (2015). Theory of Knowledge for the IB Diploma, 2nd Ed. Cambridge.
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 a reaction/response essay.
④	c	Students will be able to make 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		Several vocabulary, written response, reading/listening comprehension, and/or review assessments based on the content of in-class activities and assignments (20%) Feedback will be given in the next class session.
	②	✓	
	③		
	④		
	⑤	✓	
	⑥		
Reports	①		One reaction/response essay (30%) Essay includes an outline, first draft, 2 writing conferences, and final draft. Feedback will be given in the next class session.
	②	✓	
	③	✓	
	④		
	⑤	✓	
	⑥	✓	
Presentations	①		One jigsaw presentation project (30%) Project includes an outline, delivery of presentation, preparation of supplementary materials, and self-evaluation/reflection. Feedback will be given in the next class session.
	②	✓	
	③		
	④	✓	
	⑤	✓	
	⑥	✓	
Works	①		
	②		
	③		
	④		
	⑤		
	⑥		
Portfolios	①	✓	In-class or assignment handouts for preparation and review of discussion activities (20%) Feedback will be given in the next 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 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 – Various articles, book/web resources	50
2 /	Students will review and discuss topics related to the theme. Theme: Cultural perspectives on knowledge 1 Quiz 1	Individual, pair, and group work; discussion	Review: Complete the worksheet based on the class activities. Reading – Various articles, book/web resources	50
3 /	Students will review and discuss topics related to the theme. Theme: Cultural perspectives on knowledge 2 Quiz 2	Individual, pair, and group work; discussion	Review: Complete the worksheet based on the class activities. Reading – Various articles, book/web resources	50
4 /	Students will review and discuss topics related to the theme. Theme: Cultural perspectives on knowledge 3 Quiz 3	Individual, pair, and group work; discussion	Review: Complete the worksheet based on the class activities. Reading – Various articles, book/web resources	50
5 /	Students will review and discuss topics related to the theme. Theme: Cultural perspectives on knowledge 4 Quiz 4	Individual, pair, and group work; discussion	Review: Complete the worksheet based on the class activities. Reading – Various articles, book/web resources	50
6 /	Students will review, discuss, and brainstorm ideas and opinions. Students will research related information to support their ideas. Theme: Cultural perspectives on knowledge 5 Quiz 5	Individual, pair, and group work; discussion	Review: Complete outline and Reaction/Response Essay Draft 1	50
7 /	Students will brainstorm ideas and opinions. Students will research and learn how to appropriately reference sources to write a reaction/response essay.	Individual, pair, and group work; discussion	Review: Complete Reaction/Response Essay Final Draft due Class 9	50
8 /	Students will participate in writing conferences. Students will create teams, choose topics, and participate in brainstorming and background building communication activities.	Individual, pair, and group work; discussion	Review: Complete the worksheet based on the class activities. Reading – Various articles, book/web resources	50
9 /	Students will research information related to their topic and learn how to appropriately reference sources for a presentation. Theme: Areas of Knowledge	Individual, pair, and group work; discussion	Review: Start presentation outline	50
10 /	Students will continue to research and organize presentation contents. Theme: Areas of Knowledge	Individual, pair, and group work; discussion	Review: Complete presentation outline	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 /	Students will prepare presentation slides and supplementary materials for their presentation. Theme: Areas of Knowledge *Reaction/Response Essay Returned*	Individual, pair, and group work; discussion	Review: Complete presentation slides and supplemental materials Reading – Various articles, book/web resources	50
12 /	Jigsaw Presentation/Discussion Theme: Math, Natural science, Human science Students will deliver presentations and lead discussions/activities based on supplemental materials connected to their topic of research. Quiz 6	Individual, pair, and group work; discussion	Review: Complete the worksheet based on the class activities. Reading – Various articles, book/web resources	50
13 /	Jigsaw Presentation/Discussion Theme: Arts, History, Ethics Students will deliver presentations and lead discussions/activities based on supplemental materials connected to their topic of research. Quiz 7	Individual, pair, and group work; discussion	Review: Complete the worksheet based on the class activities. Reading – Various articles, book/web resources	50
14 /	Jigsaw Presentation/Discussion Theme: Religious and Indigenous knowledge Students will deliver presentations and lead discussions/activities based on supplemental materials connected to their topic of research. Quiz 8	Individual, pair, and group work; discussion	Review: Complete the worksheet based on the class activities. Review: Complete written reflection	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/Discussion Project Returned*	Individual, pair, and group work; discussion		

2024 Syllabus

Instructor with "＊"means an instructor with company experience

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

Target Grade	Instructor	Office	E-mail Address	Office Hours
5	FUJISHIMA, Satoshi / KUSHIMA, Yoshihiro	Kanazawa C		Wednesday 16:50-17:30

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.

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

2024 Syllabus

Instructor with "＊"means an instructor with company experience

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

Target Grade	Instructor	Office	E-mail Address	Office Hours
5	FUJISHIMA, Satoshi / KUSHIMA, Yoshihiro	Kanazawa C		Wednesday 16:50-17:30

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.

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	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

2024 Syllabus

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 31:104		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	✓	・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	✓	
	④		
	⑤		
	⑥		
Presentations	①	✓	This evaluation will be made by the students' presentation at internship presentation session.
	②	✓	
	③	✓	
	④	✓	
	⑤	✓	
	⑥	✓	
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	✓	
	③		
	④	✓	
	⑤	✓	
	⑥	✓	

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		

2024 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 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: Schaum's Outline of Advances Mathematics for Engineers and Scientist (McGraw Hill)
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	35	20	35	0	0	0	10	100
Comprehensive Strength Criteria	Ability to capture knowledge	15	10	10	0	0	0	0	35
	Ability to think, reason and create	20	10	10	0	0	0	0	40
	Collaboration and leadership	0	0	0	0	0	0	0	0
	Announcement / Expression / Communication	0	0	0	0	0	0	5	5
	Attitude and motivation for learning	0	0	15	0	0	0	5	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	✓	A semester final examination is given, as specified in the course schedule, to evaluate your degree of achievement comprehensively.
	②	✓	
	③	✓	
	④	✓	
	⑤	✓	
	⑥		
Quizzes	①	✓	Several 50-minute quizzes are given to improve comprehension.
	②	✓	
	③	✓	
	④	✓	
	⑤	✓	
	⑥		
Reports	①	✓	Students will prepare and submit reports to demonstrate their understanding of assigned topics and issues.
	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	✓	Students will be evaluated based on learning efforts in lectures and practices and report submission.
	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	200
2 /	Laplace Transforms (1)	Lecture and Q&A	Review lecture content and assignments	200
3 /	Laplace Transforms (2)	Lecture and Q&A	Review lecture content and assignments	200
4 /	Inverse Laplace Transforms	Lecture and Q&A	Review lecture content and assignments	200
5 /	State-Space Representation	Lecture and Q&A	Review lecture content and assignments	200
6 /	Review for Quiz 1	Review	Prepare for quiz	200
7 /	Quiz 1	Quiz	Review	200
8 /	Quiz 1 Return Transfer Function (1)	Lecture and Q&A	Review lecture content and assignments	200
9 /	Transfer Function (2)	Lecture and Q&A	Review lecture content and assignments	200
10 /	Transfer Function (3)	Lecture and Q&A	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	Review lecture content and assignments	200
12 /	Block Diagram (2)	Lecture and Q&A	Review lecture content and assignments	200
13 /	Review for Quiz 2	Review	Prepare for quiz	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		

2024 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		Wednesday 4:50-5:30

Course Objectives

	Keywords (10.5pt)	Learning Objectives (10.5pt)
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 (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.

The progression of this course is as follows:

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

Required Materials (textbooks, reference books, reserved books) (10.5pt)
Textbooks: Engineering Mechanics: Dynamics, SI Edition (English Edition), WILEY ISBN-13: 978-1292088723
Reference books:
Reserved books:

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

An understanding of:

- basic physics concepts
- static forces acting on rigid bodies

No.	Program Objectives	Target Abilities for Students (9pt)
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 (10.5pt)
Exams	①	✓	There will be a final exam at the end of the semester that will test you 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 you on the concepts introduced in the weeks before the quiz. For these quizzes you 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. Some time will be allotted during class to review the homework assignments, but you will be need to spend time outside of class to complete them. Late home 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 (10.5pt)	Description of Standard Achievement (10.5pt)
- 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 (10pt)	Method (10pt)	Assignments (10pt) (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 (10pt)	Method (10pt)	Assignments (10pt) (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			

2024 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		Wednesday 4:50-5:30

Course Objectives

	Keywords (10.5pt)	Learning Objectives (10.5pt)
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 (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.

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

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

Textbooks: Engineering Mechanics: Dynamics, SI Edition (English Edition), WILEY ISBN-13: 978-1292088723

Reference books:

Reserved books:

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

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 (9pt)
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 (10.5pt)
Exams	①	✓	There will be a final exam at the end of the semester that will test you 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 you on the concepts introduced in the weeks before the quiz. For these quizzes you 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. Some time will be allotted during class to review the homework assignments, but you will be need to spend time outside of class to complete them. Late home 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 (10.5pt)	Description of Standard Achievement (10.5pt)
- 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 (10pt)	Method (10pt)	Assignments (10pt) (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 (10pt)	Method (10pt)	Assignments (10pt) (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			

2024 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	31.309		Friday 16:30-17:30

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 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	60	40	0	0	0	0	0	100
Comprehensive Strength Criteria	Ability to capture knowledge	30	20	0	0	0	0	0	50
	Ability to think, reason and create	30	20	0	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	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	✓	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		
	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		

2024 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	31.309		Friday 16:30-17:30

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 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
Calculation of cross-sectional parameters and deflection of the beam.

(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		60	40	0	0	0	0	0	100
Comprehensive Strength Criteria	Ability to capture knowledge	30	20	0	0	0	0	0	50
	Ability to think, reason and create	30	20	0	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	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	レ	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	レ	
	③	レ	
	④	レ	
	⑤	レ	
	⑥	レ	
Quizzes	①		Descriptive quizzes given on the after of sections: (1) Deflection of the beam (2) Column buckling
	②		
	③	レ	
	④	レ	
	⑤	レ	
	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		
	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		

2024 Syllabus

Instructor with "＊"means an instructor with company experience

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

Target Grade	Instructor	Office	E-mail Address	Office Hours
5	HUSSIEN, Alaa	Kanazawa C 31-124		(Mon.-Fri.) 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. First, students study the basic units and dimensions and learn how to find the units and dimensions of any physical quantity. Then, know the definition of some measurement terms such as accuracy, precision, mean, median, error, etc. Students will learn how to calculate the standard deviation of a set of data. In addition, they will learn function approximation using least square method. The second part will be project based learnt topics, as 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 as a homework. 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%). The homework equates 20% of the total score.
	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 submit a report to describe the work and show the results. (10%)
	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 Solving a worksheet.	Read the course syllabus and review the notes of the lecture. Complete solving the questions of the worksheet.	200
2 /	Measurements terms definitions. Measurement error and error propagation.	A lecture demonstrates the topic. Solving a worksheet.	Review materials of last class. Do the assignments. Prepare for the next class.	200
3 /	Standard deviation Z- score	A lecture demonstrates the topic. Solving a worksheet.	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. Solving a worksheet.	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. Solving a worksheet.	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. Solving a worksheet.	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. Solving a worksheet.	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. Solving a worksheet.	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. Solving a worksheet.	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	Study for the final exam	200
17 /	Final Exam Return. Self-check.	Return the exams results.		

2024 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	Control system	Students will: (1) Learn the basics of developing control system (2) Learn Laplace transformation and the transfer functions of control systems (3) Learn the simulation method of control system by MATLAB/Simulink (4) Learn the basics of control system analysis based on the transient and frequency response
2	Laplace transform	
3	Transfer function, block diagram	
4	Frequency response, transient response	
5	Discrimination of stability	

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 is a basic course in control engineering. We will cover the following topics:

1. Laplace transform
2. Transfer function
3. Block diagram
4. Bode diagram
5. Stability of control system
6. Design of control system

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: Control Engineering: MATLAB Exercises
Reserved books:

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

It is desirable that you fully understand and master the contents of the mechanics and mathematics courses.

No.	Program Objectives	Target Abilities for Students (9pt)
①	h, i	Be able to Laplace transform a simple mathematical model of a system and express it using a transfer function.
②	h, i	Be able to use MATLAB/Simulink to create a block diagram of a system.
③	h, i	Be able to express the dynamic characteristics of a system as transient and frequency response characteristics.
④	h, i	Be able to can use MATLAB/Simulink to simulate the responsiveness of control systems.
⑤	h, i	Be able to discriminate the stability of control system.
⑥	h, i	Be able to design the control system.

Evaluation Criteria

Criteria and Ratio \ Evaluation Method		Exams	Quizzes	Reports	Presentations	Works	Portfolios	Others	Total
Total Evaluation Ratio		35	20	35	0	0	0	10	100
Comprehensive Strength Criteria	Ability to capture knowledge	15	10	10	0	0	0	0	35
	Ability to think, reason and create	20	10	10	0	0	0	0	40
	Collaboration and leadership	0	0	0	0	0	0	0	0
	Announcement / Expression / Communication	0	0	0	0	0	0	5	5
	Attitude and motivation for learning	0	0	15	0	0	0	5	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	✓	A semester final examination is given, as specified in the course schedule, to evaluate your degree of achievement comprehensively.
	②	✓	
	③	✓	
	④	✓	
	⑤	✓	
	⑥	✓	
Quizzes	①	✓	Several 50-minute quizzes are given to improve comprehension.
	②	✓	
	③	✓	
	④	✓	
	⑤	✓	
	⑥	✓	
Reports	①	✓	Students will prepare and submit reports to demonstrate their understanding of assigned topics and issues.
	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	✓	Students will be evaluated based on learning efforts in lectures and practices and report submission.
	②	✓	
	③	✓	
	④	✓	
	⑤	✓	
	⑥	✓	

Specific Achievement Criteria

Description of Ideal Achievement (10.5pt)	Description of Standard Achievement (10.5pt)
(1) Students can design control systems for simple mechanical systems. (2) Students can express the mathematical model of an automatic control system as a transfer function. (3) Students can express the dynamic characteristics of the automatic control system as transient and frequency response characteristics, and explain what they mean. (4) Students can determine and confirm the stability of the designed control system. (5) Students can use MATLAB / Simulink to simulate the response characteristics of designed control system.	(1) Students can understand the elements necessary for designing control systems for mechanical systems. (2) Students can explain the transfer function. (3) Students can explain the dynamic characteristics of control systems. (4) Students can explain how to determine the stability of the control system. (5) Students can simulate control system responses with MATLAB / Simulink.

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 MATLAB/Simulink Installation	Guidance Lecture and Q&A	Understand the objectives of the course	200
2 /	How to use MATLAB/Simulink	Lecture and Q&A	Review lecture content and assignments	200
3 /	Laplace Transforms Inverse Laplace Transforms	Quiz Lecture and Q&A	Review lecture content and assignments	200
4 /	Logarithmic Graph Unit of Gain	Lecture and Q&A	Review lecture content and assignments	200
5 /	Frequency Response Nyquist Plot	Lecture and Q&A	Review lecture content and assignments	200
6 /	Review for Quiz	Review	Prepare for quiz	200
7 /	Quiz	Quiz	Review	200
8 /	Quiz Return Bode Plot (1)	Lecture and Q&A	Review lecture content and assignments	200
9 /	Bode Plot (2)	Lecture and Q&A	Review lecture content and assignments	200
10 /	Stability Analysis (1)	Lecture and Q&A	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 /	Stability Analysis (2)	Lecture and Q&A	Review lecture content and assignments	200
12 /	Arduino MATLAB/Simulink Exercises (1)	Lecture and Q&A	Review lecture content and assignments	200
13 /	Arduino MATLAB/Simulink Exercises (2)	Lecture and Q&A	Review lecture content and assignments	200
14 /	Arduino MATLAB/Simulink Exercises (3)	Lecture and Q&A	Review lecture content and assignments	200
15 /	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		

2024 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		Wednesday 4:50-5:30

Course Objectives

	Keywords (10.5pt)	Learning Objectives (10.5pt)
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 regards to modern society.
2	Crystal Structure	
3	Fracture	
4	Fabrication and Processing	
5	Metal, Ceramic, Polymer, Composite	

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.

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 be will 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.

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

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) (10.5pt)

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

No.	Program Objectives	Target Abilities for Students (9pt)
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 (10.5pt)
Exams	①	✓	There will be a final exam at the end of the semester that will test you on important vocabulary and terminology as well as the concepts regarding the materials that you 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, you are allowed to use your own homework that you have completed as reference material for the quiz. You are not allowed to use your 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. It is important that you understand the what is being asked in each problem and your individual answer to those problems as they will be your reference materials for the quizzes. Furthermore, the contents of the homework will connect to the following week's topics. Due to this, homework must be done 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 (10.5pt)	Description of Standard Achievement (10.5pt)
- 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 (10pt)	Method (10pt)	Assignments (10pt) (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 (10pt)	Method (10pt)	Assignments (10pt) (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			

2024 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	FUKUE, Takashi	Yatsukaho C 61.210		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 world. (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 the quantitative conservation of energy through the explanation of 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 properties of vapor as an example of real gas. Especially, 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 the 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 contents of the course 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 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 cycles and the vapor cycle 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 cycles and the vapor cycle 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 whole contents of thermal engineering	Review Lecture Self-check	Review the previous contents	100 100

2024 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	POKU, David	KC 31-118-1		9:00-17:00

Course Objectives

Keywords (10.5pt)		Learning Objectives (10.5pt)
1	Programming	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	Python	
3	Data Structures	
4	Computation	
5	Mechatronics	

Course Description and Expectations for Students (10.5pt)

This extensive 30-week 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, web development, data analysis, machine learning, networking, system administration, and more. Each week focuses on a specific aspect of Python, ensuring a thorough understanding of its applications in fields like cybersecurity, finance, scientific computing, graphic design, IoT, cloud computing, game development, and blockchain technology. The course culminates in a capstone project, allowing students to apply their learning to a comprehensive, real-world problem.

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	15	15	40	0	30	0	100
Comprehensive Strength Criteria	Ability to capture knowledge	0	5	5	5	0	10	0	25
	Ability to think, reason and create	0	5	5	5	0	10	0	25
	Collaboration and leadership	0	0	0	10	0	0	0	10
	Announcement / Expression / Communication	0	5	5	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	✓	There will be a quiz in week 4 / 8 / 14
	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)
Hands-On Engagement: Complete practical exercises and group projects to apply theoretical concepts in real-world scenarios. Research and Exploration: Undertake research activities, data collection, and case studies to deepen understanding of AI applications. Creative Thinking: Demonstrate creativity in projects, especially in envisioning the future of AI.	A solid foundation in critical thinking and problem-solving skills. The ability to innovate and think creatively in various situations. Effective communication skills, both in personal and professional contexts. The capacity to collaborate with others, showing flexibility and empathy.

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 /	Week 1 lesson 1: Introduction to Python ● What is Python? Overview and Applications ● Setting Up: Installing Python and IDEs ● Writing Your First Python Program	Activity / Explanation / Report	Confirm the schedule and objectives. Making weekly report	60
2 /	lesson 2: Python Basics ● Python Syntax and Variables ● Data Types and Operations Basic Input and Output	Activity / Explanation / Report	Confirm the schedule and objectives. Making weekly report	60
3 /	Week 2 Lesson 3: Control Structures ● Conditional Statements (if, elif, else) ● Loop Constructs: for and while Loops ● Control Flow Tools: break, continue, pass	Activity / Explanation / Report		60
4 /	Lesson 4: Functions and Modules ● Defining and Using Functions ● Python Modules and Packages ● Namespaces and Scope	Activity / Explanation / Report		60
5 /	Week 3: Lesson 5 Data Structures I ● Lists and List Operations ● Tuples and Sets ● Dictionaries and Their Applications	Activity / Explanation / Report		60
6 /	Lesson 6 Data Structures II ● Advanced List Comprehensions ● Stacks, Queues, and Heaps ● Implementing Data Structures: Linked Lists, Trees	Activity / Explanation / Report		60
7 /	Week 4: Lesson 7 String Manipulation ● Basic String Operations ● String Formatting and Methods ● Regular Expressions in Python	Activity / Explanation / Report	Quiz Report from lesson 1-3 Project review	60
8 /	Lesson 8 File Handling ● Reading and Writing Files ● Working with Different File Formats (JSON, CSV) ● File and Directory Management	Activity / Explanation / Report	Quiz Report from lesson 1-3 Project review	60
9 /	Week 5: Lesson 9: Object-Oriented Programming ● Introduction to OOP: Classes and Objects ● Inheritance and Polymorphism ● Special Methods (Magic Methods)	Activity / Explanation / Report		60
10 /	Lesson 10: Advanced Python Concepts ● Iterators and Generators ● Decorators and Context Managers ● Error and Exception Handling	Activity / Explanation / 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)
11 /	Week 6 Lesson 11: Python for Web Development ● Web Scraping with Python ● Introduction to Web Frameworks (Flask/Django) ● Building a Basic Web Application	Activity / Explanation / Report		60
12 /	Lesson 12: Working with Databases ● SQL Basics and SQLite ● Integrating Python with SQL Databases ● ORMs in Python (like SQLAlchemy)	Activity / Explanation / Report		60
13 /	Week 7 Lesson 13: Python for Data Analysis ● Introduction to Pandas and NumPy ● Data Cleaning and Preparation ● Data Analysis and Visualization with Matplotlib and Seaborn	Activity / Explanation / Report		60
14 /	Lesson 14: Python for Data Science ● Introduction to Machine Learning with Python ● Simple Machine Learning Models ● Data Preprocessing and Analysis with Scikit-Learn	Activity / Explanation / Report		60
15 /	Week 8 Lesson 15: Advanced Data Science Topics ● Advanced Machine Learning Concepts ● Introduction to Neural Networks and TensorFlow ● Deep Learning Project	Activity / Explanation / Report	Quiz Report from lesson 4-8 Project review	60
16 /	Lesson 16: Python in Networking ● Basics of Network Programming ● Creating Network Applications ● Working with Network Protocols	Activity / Explanation / Report	Quiz Report from lesson 4-8 Project review	60
17 /	Week 9: Lesson 17: Python for System Administration ● Scripting for System Administration ● Automating System Maintenance Tasks ● Working with Operating System Services	Activity / Explanation / Report		60
18 /	Lesson 18 Multithreading and Multiprocessing ● Introduction to Parallel Execution ● Multithreading in Python ● Multiprocessing and Concurrency	Activity / Explanation / Report		60
19 /	Week 10 Lesson 19: Python in Cybersecurity ● Basics of Python in Cybersecurity ● Writing Scripts for Security Automation ● Ethical Hacking with Python	Activity / Explanation / Report		60
20 /	Lesson 20: Python in Finance ● Financial Analysis with Python ● Algorithmic Trading Strategies ● Risk Management Models	Activity / Explanation / 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 /	Week 11 Lesson 21: Advanced Web Development ● Advanced Flask/Django Features ● RESTful API Development with Python ● Full-Stack Python Web Development	Activity / Explanation / Report		60
22 /	Lesson 22: Python in Scientific Computing ● Scientific Computing with SciPy ● Working with Scientific Data ● Simulation and Modeling in Python	Activity / Explanation / Report		60
23 /	Week 12: Lesson 23: Python for Graphic Design and Multimedia ● Creating Graphics with Python ● Working with Images and Multimedia ● Building Interactive Applications	Activity / Explanation / Report		60
24 /	Lesson 24: Advanced Topics in Data Science ● Time Series Analysis with Python ● Natural Language Processing (NLP) ● Advanced Deep Learning Projects	Activity / Explanation / Report		60
25 /	Week 13: Lesson 25: Python for IoT ● Introduction to IoT with Python ● Building IoT Devices with Raspberry Pi/Arduino and Python	Activity / Explanation / Report		60
26 /	Lesson 26: Cloud Computing with Python ● Introduction to Cloud Computing ● Integrating Python with AWS/Azure/GCP ● Building and Deploying Python Applications in the Cloud	Activity / Explanation / Report		60
27 /	Week 14: Lesson 27: Python for Game Development ● Game Development Basics with Pygame ● Designing and Creating a Simple Game ● Advanced Game Mechanics and Features	Activity / Explanation / Report	Report from lesson 4-8 Hand in Project Prepare for the presentation and the report	60
28 /	Lesson 28: Python and Blockchain ● Understanding Blockchain Fundamentals ● Implementing Blockchain with Python ● Building a Simple Cryptocurrency	Activity / Explanation / Report	Report from lesson 4-8 Hand in Project Prepare for the presentation and the report	60
29 /	Week 15 Lesson 29: Project Presentation	Presentation	Presentation	60
30 /	Lesson 30: Project Presentation	Presentation	Presentation	60

2024 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 builds on knowledge about mathematics, probability and statistics from previous courses and introduces the machine learning techniques, such as linear regression analysis, k-NN, Naïve Bayes, decision tree, and neural network etc. Students will gain a deeper understanding of machine learning techniques through manual calculations and program implementation in Python.

Advice on taking this course:
- Have 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)

Basic knowledge of computers and Python programming.
Basic knowledge of mathematics, probability, and statistics from Information Mathematics I and II.

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 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	30	0	70	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	30	0	0	40
	Collaboration and leadership	0	0	0	0	0	0	0	0
	Announcement / Expression / Communication	0	0	5	0	5	0	0	10
	Attitude and motivation for learning	0	0	5	0	10	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.
	②	✓	
	③	✓	
	④	✓	
	⑤	✓	
	⑥		
Presentations	①		
	②		
	③		
	④		
	⑤		
	⑥		
Works	①	✓	Works are programming exercises assigned during class. The Python source code should be submitted by the due date designated by the instructors.
	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	Lecture	Read the given lecture slides.	200
2 /	Regression Analysis (1) Students will learn about simple regression analysis by manual calculation and Python coding.	Lecture and Exercise	Read the given lecture slides and proceed with exercises.	200
3 /	Regression Analysis (2) Students will learn about simple regression analysis by manual calculation and Python coding.	Exercise	Read the given lecture slides and proceed with exercises.	200
4 /	Regression Analysis (3) Students will learn about Python coding for simple regression analysis.	Exercise	Read the given lecture slides and proceed with exercises.	200
5 /	k-Nearest Neighbor (1) Students will learn about k-NN by manual calculation and Python coding.	Lecture and Exercise	Read the given lecture slides and proceed with exercises.	200
6 /	k-Nearest Neighbor (2) Students will learn about k-NN by manual calculation and Python coding.	Exercise	Read the given lecture slides and proceed with exercises.	200
7 /	k-Nearest Neighbor (3) Scaling Students will learn about Scaling methods and applying them to the k-NN with Python coding.	Lecture and Exercise	Read the given lecture slides and proceed with exercises.	200
8 /	Naive Bayes (1) Students will learn about Naive Bayes by hand calculation and Python coding.	Lecture and Exercise	Read the given lecture slides and proceed with exercises.	200
9 /	Naive Bayes (2) Students will learn about Naive Bayes by hand calculation and Python coding.	Exercise	Read the given lecture slides and proceed with exercises.	200
10 /	Naive Bayes (3) Students will learn about Naive Bayes with Python coding.	Exercise	Read the given lecture slides and proceed with exercises.	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 (1) Students will learn about Decision Tree by hand calculation and Python coding.	Lecture and Exercise	Read the given lecture slides and proceed with exercises.	200
12 /	Decision Tree (2) Students will learn about outline of deep learning and coding style.	Exercise	Read the given lecture slides and proceed with exercises.	200
13 /	Cross Validation Students will learn about Cross Validation and Python coding.	Lecture and Exercise	Read the given lecture slides and proceed with exercises.	200
14 /	Correctness (1) Students will learn about Correctness of models and Python coding.	Lecture and Exercise	Read the given lecture slides and proceed with exercises.	200
15 /	Correctness (2) Students will learn about Correctness of models and Python coding.	Exercise	Read the given lecture slides and proceed with exercises.	200

2024 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 31:104		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.

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:

Reserved books: 「2023 年度版　基本情報技者標準教科書」(オーム社) ISBN 978-4274229817

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		50	0	0	0	20	0	30	100
Comprehensive Strength Criteria	Ability to capture knowledge	20	0	0	0	10	0	10	40
	Ability to think, reason and create	20	0	0	0	0	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	10	0	0	0	10	0	10	30

* 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 create a program to operate a database and evaluate their understanding of database utilization.
	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 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
8 /	SQL② Able to group data and extract data by using complex extraction conditions of SQL.	Lecture	Read textbook and Assignment	200
9 /	SQL③ Able to make complex SQL statement and join tables	Lecture	Read textbook and Assignment	200
10 /	SQL ④ 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 and why deadlock happens. Able to perform SQL operations using transactions.	Lecture	Read textbook and Assignment	200
12 /	DB programming ① Create a program to perform CRUD operations.	Lecture Self-Study	Read textbook and programming	200
13 /	DB programming ② Create a program to perform CRUD operations	Lecture Self-Study	Assignment of DB programming	200
14 /	DB programming ③ Create a program to perform CRUD operations	Lecture Self-Study	Assignment of DB programming	200
15 /	Wrap up Submit an assignment Review of what you have learned so far	Lecture Self-Study	Assignment of DB programming	200
16 /	Final exam			
17 /	Review of final exam results Self-check			

2024 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.

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 through hands-on exercises that build a computer graphics 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 consider your assignments late 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

2024 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	OHTSUKA, Sakuichi	Kanazawa C: 31-312		Make an appointment in class

Course Objectives

Keywords (10.5pt)		Learning Objectives (10.5pt)
1	Media Information	In this course, students learn basics of (1) auditory- and visual-perceptions, human interfaces, and cognitive biases, (2) recording and processing of media information in computer systems, and (3) methods for user-oriented effective media production based on logical persuasion, resulting that they will acquire abilities to produce multi-media contents and to judge the relationship between human- and media- information.
2	Human Interface (HI)	
3	Computer	
4	Perception (Visual and auditory)	
5	Cognitive bias	

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.

< Course description >

In nowadays, massive media information, e.g., texts, sounds, images, and movies, are utilized in computer-networks and are applied to real world activities. In this course, students learn basics of (1) auditory- and visual-perceptions, human interfaces, and cognitive biases, (2) recording and processing of media information in computer systems, and (3) methods for user-oriented effective media production based on logical persuasion.

As a result, they will acquire abilities to produce basic multi-media contents and to judge the relationship between human- and media- information.

< Expectations for Students >

Total ability, combined with many kinds of basic knowledge, is required for learning this course. Therefore, students need to review their basic skills: e.g., composition in native language, physics (sound and light), and mathematics (esp. index, logarithm, binary, and hexadecimal).

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

Textbooks: R. Gregory, Eye and Brain: The Psychology of Seeing (Princeton Univ. Press), ISBN: 978-0-691-16516-5

Reference books: 松本 輝彦, 5段落エッセイ指導で日本の子どもが変わる！（リーブル出版）, ISBN: 978-4-86338-115-5

Reserved books:

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

As written in "Expectations for Students".

No.	Program Objectives	Target Abilities for Students (9pt)
①	h	Basic comprehension of auditory- and visual-perceptions, human interfaces, and cognitive biases for media-handling.
②	h	Basic comprehension of media information processing and recording in computer systems.
③	g	Be able to create new value through the practice of design thinking and broad investigations of academic disciplines.
④	f	Having organized one's thoughts logically, effectively convey them in a way that takes into consideration the position and emotions of others.
⑤	e	Maintain a clear sense of identity while possessing a fundamental understanding of various cultures and value systems.
⑥	i	With sound learning as a foundation, maintain an attitude for continuously acquiring new knowledge and skills.

Evaluation Criteria

Criteria and Ratio \ Evaluation Method		Exams	Quizzes	Reports	Presentations	Works	Portfolios	Others	Total
Total Evaluation Ratio		0	0	50	40	0	0	10	100
Comprehensive Strength Criteria	Ability to capture knowledge	0	0	20	10	0	0	0	30
	Ability to think, reason and create	0	0	10	10	0	0	0	20
	Collaboration and leadership	0	0	5	5	0	0	0	10
	Announcement / Expression / Communication	0	0	10	10	0	0	0	20
	Attitude and motivation for learning	0	0	5	5	0	0	10	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		
	②		
	③		
	④		
	⑤		
	⑥		
Reports	①	✓	Students need to comprehend the course contents clearly and summarize their own idea logically with concrete example(s).
	②	✓	
	③	✓	
	④	✓	
	⑤	✓	
	⑥	✓	
Presentations	①	✓	Students will present the results of group-discussions on specific topics decided by each group based on course contents.
	②	✓	
	③	✓	
	④	✓	
	⑤	✓	
	⑥	✓	
Works	①		
	②		
	③		
	④		
	⑤		
	⑥		
Portfolios	①		
	②		
	③		
	④		
	⑤		
	⑥		
Others	①		Students need to make active discussions during group works and to make questions in the course if they feel their comprehension would be insufficient.
	②		
	③	✓	
	④	✓	
	⑤		
	⑥		

Specific Achievement Criteria

Description of Ideal Achievement (10.5pt)	Description of Standard Achievement (10.5pt)
Students can clearly explain (1) the basics of recording and processing of media information, e.g., characters, sounds, images, and movies, in computer systems and (2) relationship between auditory- and visual-perceptions and media information. Combining the new knowledge acquired in this course to the previous experiences of media creation during other courses, they will be able to create more sophisticated media arts.	Students will comprehend (1) the basics of recording and processing of media information, e.g., characters, sounds, images, and movies, in computer systems and (2) relationship between auditory- and visual-perceptions and media information. They will be able to comprehend relationships between the new knowledge acquired in this course and the previous experiences of media creation during other courses.

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 (1): understanding (a) the difference in criteria between physical world including engineering and psychological world (auditory- and visual-perception and cognition, and (b) difference in the meanings of “information” between in Japan and in general countries.	Lecture & Active Learning	Reviewing and summarizing of this class and previewing of next class outline.	100
2 /	Orientation (2): learning the standard methods of communication in the world, i.e., outside of Japan, e.g., (a) top-down thinking processes and (b) paragraph writing.	Lecture & Active Learning	Reviewing orientation and making report and previewing of next class outline.	200
3 /	Light and sound in physical world.	Lecture & Active Learning	Reviewing and summarizing of this class and previewing of next class outline.	200
4 /	Comparison of auditory- and visually-sensing: differences between in case of human and other animals.	Lecture & Active Learning	Reviewing and summarizing of this class and previewing of next class outline.	200
5 /	Utilizing index and logarithm in human auditory- and visually-sensing.	Lecture & Active Learning	Reviewing and summarizing of this class and previewing of next class outline.	200
6 /	Relationship between “perception and cognition” and the meanings of information processing in human brain, i.e., “intuition and logical information”.	Lecture & Active Learning	Reviewing and summarizing of this class and previewing of next class outline.	200
7 /	Introduction to vision: what’s eye.	Lecture & Active Learning	Reviewing and summarizing of this class and previewing of next class outline.	200
8 /	Visual information processing in human brain (1): decomposition and analysis of acquired information.	Lecture & Active Learning	Reviewing and summarizing of this class and previewing of next class outline.	200
9 /	Visual information processing in human brain (2): integration of fragmented information and reconstruction of percepts.	Lecture & Active Learning	Reviewing and summarizing of this class and previewing of next class outline.	200
10 /	Fundamentals of visual perception: brightness, color, motion, and depth.	Lecture & Active Learning	Reviewing first half of the classes and making intermediate report and previewing of next class outline.	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 /	Basics of information processing in computer and digital representation of characters.	Lecture & Active Learning	Reviewing and summarizing of this class and previewing of next class outline.	200
12 /	Basics of digital encoding methods of sound and improvement methods of its encoding efficiency.	Lecture & Active Learning	Reviewing and summarizing of this class and previewing of next class outline.	200
13 /	Basics of digital encoding methods of image and video and improvement methods of their encoding efficiency.	Lecture & Active Learning	Reviewing and summarizing of this class and previewing of next class outline.	200
14 /	Group discussions on specific topics decided by each group.	Lecture & Active Learning	Finishing group-work and preparing presentation.	200
15 /	Presentations by each group and supplemental remarks.	Lecture & Active Learning	Reviewing all the classes and making final report.	300

2024 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	Kanazawa C 31.104		Friday 16:30-17:30

Course Objectives

Keywords	Learning Objectives
1 UNIX 2 Process Management 3 File System 4 Shell 5 System Call Programming	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.

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.
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		50	0	0	0	20	0	30	100
Comprehensive Strength Criteria	Ability to capture knowledge	20	0	0	0	10	0	10	40
	Ability to think, reason and create	20	0	0	0	0	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	10	0	0	0	10	0	10	30

* 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 startied 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	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	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	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) Comprehensive Assignment	Lecture Self-Study	Complete the assignment	200
15 /	Wrap up Submit an assignment Review of what you have learned so far	Lecture Self-Study	Complete and submit the assignment	200
16	Final Exam			
17	Review of final exam results Self-check			

2024 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	MUKAI, Hiroaki / SAKAMOTO, Shinji	21.4		Monday 17:05 - 18:45

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-minute 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

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

Textbooks: "Mastering TCP/IP (6th edition)" (in Japanese), T. Takeshita and others, Ohmsha, ISBN-13: 978-4274068768

Reference books: Nothing.

Reserved books: Nothing.

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

Basic knowledge and skills (binary number calculation, programming, etc.) related to first-year computer learning are required.

No.	Program Objectives	Target Abilities for Students (9pt)
①	h, i	Be able to explain the basic mechanisms of computer networks.
②	h, i	Be able to explain the functions of each layer in the OSI reference model.
③	h, i	Be able to explain the functions of each layer in TCP/IP protocols.
④	h, i	Be able to explain the basic mechanisms of the Internet.
⑤	h, i	Be able to perform network diagnostics using basic network commands.
⑥	h, i	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	50	50	0	0	0	0	100
Comprehensive Strength Criteria	Ability to capture knowledge	0	10	10	0	0	0	0	20
	Ability to think, reason and create	0	10	10	0	0	0	0	20
	Collaboration and leadership	0	10	10	0	0	0	0	20
	Announcement / Expression / Communication	0	10	10	0	0	0	0	20
	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	✓	Several quizzes to understand basic knowledge and theories related to computer networks learned in class will be given. Specifically, the following items are reviewed: 1. The basic mechanism of information communication, the OSI model, and the TCP/IP model 2. The physical layer and the datalink layer. 3. The network layer and the transport layer. 4. Routing protocols and the application layer.
	②	✓	
	③	✓	
	④	✓	
	⑤	✓	
	⑥	✓	
Reports	①	✓	Several reports to understand basic knowledge and theories related to computer networks learned in class will be given. Specifically, the following items are reviewed: 1. The basic mechanism of information communication, the OSI model, and the TCP/IP model 2. The physical layer and the datalink layer. 3. The network layer and the transport layer. 4. Routing protocols and the application layer.
	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)
By the end of the course, students should be able to explain the following items systematically related to computer networks: 1. Basic information and communication systems 2. OSI reference model and TCP/IP models 3. Physical layer and datalink layer 4. Network layer and transport layer 5. Routing protocol and application layer Additionally, students should be able to use appropriate network commands and tools for network maintenance and management.	By the end of the course, students should be 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 Additionally, students should be 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 /	Overview for information & communication network (Part 1): Learn the history of various communication technologies and protocol standardization.	Lecture and exercises	Review of lecture content (history of information network, etc.) and preparation for Chapter 1 (basic network knowledge) of the textbook.	200
2 /	Overview for information & communication network (Part 2): Outline network technologies and usage patterns in recent years and learn about their relationship with this course.	Lecture and exercises	Review of lecture contents (current network usage) and preparation for Chapter 2 (basic knowledge of TCP/IP) of the textbook.	200
3 /	Fundamentals of TCP/IP: Learn the basic principles of TCP/IP networks, the mechanisms and roles of layering and encapsulation using the OSI reference model, coexistence of different models within a network, and multiprotocol networks.	Lecture and exercises	Review of lecture contents (OSI reference model and TCP/IP), and preparation for Chapter 3 (Datalink) of the textbook.	200
4 /	Datalink (Part 1): Learn about datalink systems, MAC address, Ethernet, etc.	Lecture and exercises	Review and preparation of lecture contents (various datalink systems).	200
5 /	Datalink (Part 2): Learn about wireless communication, PPP, public access network, etc.	Lecture and exercises	Review of lecture contents (various datalink systems), and preparation for Chapter 4 (IP protocol) of the textbook.	200
6 /	IP protocol: Learn about IP, IP address (IPv4/IPv6), routing, IP segmentation and reconstruction.	Lecture and exercises	Review not only the basic contents of IP and IP address calculation, but also the contents of the lectures learned in the first half.	200
7 /	Midterm Review: Test or exercises will be conducted to deepen understanding of the content and exercises relating to the lectures that have been given thus far.	Test or exercises	Preparation for Chapter 5 (Technologies related to IP) of the textbook.	200
8 /	IP related technologies: Learn about DNS, ARP, ICMP, DHCP, NAT, etc.	Lecture and exercises	Review of lecture contents (IP-related technologies) and preparation for Chapter 6 (TCP and UDP) of the textbook.	200
9 /	TCP and UDP (Part 1): Learn about TCP, UDP, port number, window control, retransmission control, flow control, and congestion control.	Lecture and exercises	Review and preparation for Chapter 6 (TCP and UDP) of the textbook.	200
10 /	TCP and UDP (Part 2): Learn about TCP, UDP, port number, window control, retransmission control, flow control, and congestion control. Additionally, exercises using these protocols will be conducted.	Lecture and exercises	Review of Chapter 6 (TCP and UDP) and preparation for Chapter 7 (Routing Protocol) of the textbook.	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 /	Routing Protocol: Learn about static routing, dynamic routing, and routing algorithms such as RIP and OSPF.	Lecture and exercises	Review of lecture contents (Routing Protocol) and preparation for Chapter 8 (Application Protocol) of the textbook.	200
12 /	Application Protocol: Learn about the server-client communication mechanism using the TCP/IP protocol and actually use various protocols.	Lecture and exercises	Review of lecture contents (various protocols in Application layer) and preparation for Chapter 9 (security) and appendix (Physical layer) of the textbook.	200
13 /	Security and Appendix (Physical layer): Learn about the importance of network security in the Internet, its realization technologies and physical layer.	Lecture and exercises	Review of lecture content and review for final test.	200
14 /	Test: Through lectures by external lecturers, students will deepen their understanding of what they have learned so far, and confirm whether they have internalized the knowledge and skills they have learned.	Lectures by external lecturers & test	Review what you have learned so far.	200
15 /	Self-evaluate achievement and general exercise: Review the returned answer-sheet and confirm the level of understanding of the lecture. Through exercises, students will deepen their understanding of what they have learned.	Self-check and exercises (LAN-cable fabrication)	Review what you have learned so far.	200

2024 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		By appointment

Course Objectives

Keywords (10.5pt)		Learning Objectives (10.5pt)
1	Bookkeeping procedure	This course is for developing business, finance and accounting abilities in students. The goal is to learn the bookkeeping procedure which records the management efforts of the managers, and the financial statements which report the business results to the stakeholders of the company, and to acquire the ability to understand the actual management situation of the company through accounting information, such as statements, quarterly reports, etc..
2	Closing procedure	
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 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:

Reference books:

Reserved books:

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 cash flow statements.
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		30	30	40	0	0	0	0	100
Comprehensive Strength Criteria	Ability to capture knowledge	6	6	8	0	0	0	0	20
	Ability to think, reason and create	6	6	8	0	0	0	0	20
	Collaboration and leadership	6	6	8	0	0	0	0	20
	Announcement / Expression / Communication	6	6	8	0	0	0	0	20
	Attitude and motivation for learning	6	6	8	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	レ	Students will be evaluated on a final exam.
	②	レ	
	③	レ	
	④	レ	
	⑤	レ	
	⑥	レ	
Quizzes	①	レ	Students will be evaluated on a quiz.
	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		
	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)
• Understand that accounting information is useful for making decisions for business owners and stakeholders. • Understand the "Bookkeeping cycle" to create accounting information 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 the "Bookkeeping cycle" to create accounting information 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	Lecture Q&A Exercises	Review the handouts Finish the assignments	200
2 /	Business simulation Exploration and discovery of concepts	Lecture Q&A Exercises	Review the handouts Finish the assignments	200
3 /	Management resources Five elements of accounting	Lecture Q&A Exercises	Review the handouts Finish the assignments	200
4 /	Transactions & Journals Journal entries and ledger postings	Lecture Q&A Exercises	Review the handouts Finish the assignments	200
5 /	“Bookkeeping cycle” Create the trial balance of totals and balances	Lecture Q&A Exercises	Review the handouts Finish the assignments	200
6 /	Wrap up and review for quiz	Lecture Q&A Exercises	Review the handouts Finish the assignments	200
7 /	Quiz	Lecture Q&A Exercises	Review the handouts Finish the assignments	200
8 /	Return and review quiz Accounting principles (GAAP)	Lecture Q&A Exercises	Review the handouts Finish the assignments	200
9 /	Cost and depreciation	Lecture Q&A Exercises	Review the handouts Finish the assignments	200
10 /	Balance sheet details and creation	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 /	Profit and loss statement details and creation	Lecture Q&A Exercises	Review the handouts Finish the assignments	200
12 /	Analysis of balance sheet and profit and loss statement	Lecture Q&A Exercises	Review the handouts Finish the assignments	200
13 /	Cash flow statements Financial and Management accounting	Lecture Q&A Exercises	Review the handouts Finish the assignments	200
14 /	Management analysis practice (MD & A)	Lecture Q&A Exercises	Review the handouts Finish the assignments	200
15 /	Review	Lecture Q&A Exercises	Review the handouts .	200
16 /	Final Exam			
17 /	Return and review final exam			