

KOREATECH English courses list

<'18.03.28, External Affairs Team>

No	Semster	Code	Course Name(Kor)	Course Name(Eng)	English	School	Credit	Lecture Hour	Practice Hour	Professor
1	Fall	CPA250	자료구조및실습	Data Structure and Practice	Y	Computer Science	3	2	2	Muhammad
2	Fall	CPA260	컴퓨터시스템기초설계	Basic Design of Computer Systems	Y	Computer Science	3	2	2	Yungbok, Joo
3	Fall	CPC311	윈도우즈프로그래밍	Windows Programming	Y	Computer Science	3	2	2	Yungbok, Joo
4	Fall	CPS510	데이터베이스시스템	Database System	Y	Computer Science	3	2	2	Muhammad
5	Fall	BSM461	공업통계학및실습	Engineering Statistics and Practice	Y	Electrical · Electronics&Communication	3	2	2	Lenskiy Artem
6	Spring / Fall	BSM510	수치해석및실습	Numerical Methods and Practice	Y	Electrical · Electronics&Communication	3	2	2	Manar Mohaisen
7	Spring	BSM540	프로그래밍기초	Computer Programming Basic	Y	Electrical · Electronics&Communication	3	2	2	Ajay Gautam
8	Fall	IFA193	임베디드 응용 및 실습	Applied Embedded System Lab.	Y	Electrical · Electronics&Communication	3	2	2	Jongdae, Jung
9	Spring	IFA301	전력전자공학및실습	Power Electronics and Lab.	Y	Electrical · Electronics&Communication	3	2	2	Seongchul, Oh
10	Spring	IFA341	전원장치설계	Power Supplier Design	Y	Electrical · Electronics&Communication	3	3	0	Seongchul, Oh
11	Spring	IFA380	전기기기설계	Electrical Machine Design	Y	Electrical · Electronics&Communication	3	3	0	Changsoon, Park
12	Spring	IFA421	전기응용및실습	Electric Application and Lab.	Y	Electrical · Electronics&Communication	3	2	2	Sangbong, Wi
13	Spring	IFA611	전기공학특론	Special Issues on the Electrical Engineering	Y	Electrical · Electronics&Communication	3	2	2	Ajay Gautam
14	Fall	IFA620	전기신호처리	Electric Signal Processing	Y	Electrical · Electronics&Communication	3	2	2	Ajay Gautam
15	Spring	IFB270	고급전자회로	Advanced Electronic Circuit	Y	Electrical · Electronics&Communication	3	3	0	Manar Mohaisen
16	Spring	IFB601	DSP프로세서및실습	DSP Processor and Lab	Y	Electrical · Electronics&Communication	3	2	2	Jaeyool, Im
17	Spring	IFC260	컴퓨터네트워크	Computer Network	Y	Electrical · Electronics&Communication	3	3	0	Lenskiy Artem
18	Spring / Fall	BSM761	일반화학	General Chemistry	Y	Energy, Materials&Chemical engineering	3	3	0	Yeongmi, Jeong
19	Spring	CHA131	분석화학	Analytical Chemistry	Y	Energy, Materials&Chemical engineering	3	3	0	Namjoon, Cho
20	Spring	CHA141	유기화학및실습1	Organic Chemistry and Practice1	Y	Energy, Materials&Chemical engineering	3	2	2	Byungook, Nam
21	Spring	CHA201	기기분석및실습2	Instrumental Analysis and Lab	Y	Energy, Materials&Chemical engineering	3	2	2	Namjoon, Cho
22	Spring	CHA231	생명유기화학	Life Organic Chemistry	Y	Energy, Materials&Chemical engineering	3	3	0	Yongcheol, Lee
23	Spring	CHA411	화학공정설계및실습	Chemistry Process Design and Practice	Y	Energy, Materials&Chemical engineering	3	1	4	Yeongmi, Jeong
24	Fall	ENE202	에너지물리화학2	Energy Physical Chemistry 2	Y	Energy, Materials&Chemical engineering	3	3	0	Soonmok, Choi
25	Fall	ENE230	에너지재료과학	Energy Materials Science	Y	Energy, Materials&Chemical engineering	3	3	0	Seokjun, Kim
26	Spring	MSA250	재료과학	Material Science I	Y	Energy, Materials&Chemical engineering	3	3	0	Seokjun, Kim
27	Fall	MSA281	재료강도학	Material Strength	Y	Energy, Materials&Chemical engineering	3	3	0	Arnaud Caron
28	Spring	MSA610	주조응고및실습	Casting & Solidification Processing and Practice	Y	Energy, Materials&Chemical engineering	3	2	2	Arnaud Caron
29	Fall	MSA620	분체가공및실습	Powder Materials Processing and Practice	Y	Energy, Materials&Chemical engineering	3	2	2	Haiwoong, Park
30	Fall	MSA901	FR속재료학	Metal Materials	Y	Energy, Materials&Chemical engineering	3	3	0	Junhyun, Koh
31	Spring	MSA950	재료정보처리	Application of statistical met	Y	Energy, Materials&Chemical engineering	3	2	2	Arnaud Caron
32	Spring	MSA990	비정질재료학	Amorphous materials	Y	Energy, Materials&Chemical engineering	3	3	0	Arnaud Caron
33	Fall	BSM550	프로그래밍언어	Computer Programming Language	Y	Mechanical engineering	3	2	2	Daniel G. Trainer
34	Fall	MEB301	정역학	Statics	Y	Mechanical engineering	2	2	0	Daniel G. Trainer
35	Fall	MEB321	동역학	Dynamics	Y	Mechanical engineering	3	3	0	Daniel G. Trainer
36	Spring	MEB331	열역학	Thermodynamics	Y	Mechanical engineering	3	3	0	Daniel G. Trainer
37	Spring	MEB600	수치해석및실습	Numerical Methods and Practice	Y	Mechanical engineering	3	2	2	Igor Gaponov
38	Spring	MEC431	열전달	Heat Transfer	Y	Mechanical engineering	3	3	0	Daniel G. Trainer
39	Spring	MEF452	제어공학	Mechanical Control	Y	Mechanical engineering	3	2	2	Igor Gaponov
40	Spring	MEF661	창의적공학설계	Creative Engineering Design	Y	Mechanical engineering	3	2	2	Daniel G. Trainer
41	Spring	MEF700	용접공학	Welding Engineering	Y	Mechanical engineering	3	2	2	Jeonghan, Hwang
42	Spring	MEF780	전기전자공학및실습	Electrical and Electronics Engineering and Practice	Y	Mechanical engineering	3	2	2	Igor Gaponov
43	Fall	MEH300	시스템동역학	System Dynamics	Y	Mechanical engineering	3	3	0	Igor Gaponov
44	Fall	MEH341	응용제어공학	Applied Control Engineering	Y	Mechanical engineering	3	2	2	Dongho, Shin
45	Spring	MTB302	재료역학	Solid Mechanics	Y	Mechatronics engineering	3	3	0	Byeong-gi, Kim
46	Fall	MTB417	기계요소설계	Design of Mechanical Element	Y	Mechatronics engineering	3	2	2	Byungki, Kim
47	Fall	MTF281	디스플레이공학개론	Introduction to Display Engineering	Y	Mechatronics engineering	3	3	0	Yunsi, Oh
48	Spring	MTF293	회로이론및실습	Circuit Theory and Lab.	Y	Mechatronics engineering	3	2	2	Giho, Gang
49	Spring	IMA241	회계원리와실습	Accounting Theory and Practices	Y	Industrial Management	3	2	2	Yongwan, Choi
50	Spring	IMA310	재무관리(캡스톤디자인)	Financial Management	Y	Industrial Management	3	3	0	Dooyeol, Choi
51	Spring / Fall	IMA371	국제금융론	Theory of International Finance	Y	Industrial Management	3	3	0	Dooyeol, Choi
52	Spring / Fall	IMA442	국제경영론	International Management	Y	Industrial Management	3	3	0	Olga A. Shvetsova
53	Spring / Fall	IMA482	SAP실습	SAP Lab.	Y	Industrial Management	3	2	2	Yongwan, Choi
54	Fall	IMA505	비즈니스커뮤니케이션1	Business English1	Y	Industrial Management	3	3	0	Olga A. Shvetsova
55	Spring / Fall	IMA506	비즈니스커뮤니케이션2	Business English 2	Y	Industrial Management	3	3	0	Olga A. Shvetsova
56	Spring	IMA701	식스시그마경영(캡스톤디자인)	Applications of Market Econom	Y	Industrial Management	3	2	2	Janghee, Lee
57	Fall	IMA730	하이테크마케팅	High-tech Marketing	Y	Industrial Management	3	3	0	Olga A. Shvetsova
58	Spring	IMA880	하이테크산업전략	Global strategies for high-tech industries	Y	Industrial Management	3	3	0	Olga A. Shvetsova
59	Fall	IMC602	기술경영론	Technology Management	Y	Industrial Management	3	3	0	Byeongkeun, Kim
60	Fall	IMC641	통계적품질관리	Statistic Quality Control	Y	Industrial Management	3	2	2	Janghee, Lee
61	Fall	BSM115	미적분학1	Calculus I	Y	Liberal Arts	4	4	0	Jaedong, Sim
62	Spring	BSM171	선형대수학	Linear Algebra	Y	Liberal Arts	3	2	2	Jaedong, Sim
63	Spring	BSM180	이산수학	Discrete Mathematics	Y	Liberal Arts	3	3	0	Yungbok, Joo
64	Fall	BSM191	미분방정식	Ordinary Differential Equation	Y	Liberal Arts	3	2	2	Jaedong, Sim
65	Spring	BSM313	물리사고와실험1	General Physics and Experiment 1	Y	Liberal Arts	4	3	2	Un-hak, Hwang
66	Spring / Fall	LAN335	영어회화1	English Conversation 1	Y	Liberal Arts	1	0	2	Wayne Jackson
67	Spring / Fall	LAN336	영어회화2	English Conversation 2	Y	Liberal Arts	1	0	2	Ashley D Stuenzi
68	Spring / Fall	LAN337	기초영어회화1	Basic English Conversation 1	Y	Liberal Arts	1	0	2	Ashley D Stuenzi
69	Spring / Fall	LAN362	전문영어쓰기	Advanced English Writing	Y	Liberal Arts	3	3	0	Ashley D Stuenzi
70	Spring / Fall	LAN471	영어토론과발표	English Debate and Presentations	Y	Liberal Arts	3	3	0	James Robertson
71	Spring / Fall	LAN481	언어학개론	Introduction to Linguistics	Y	Liberal Arts	3	3	0	Junhyun, Kim
72	Spring / Fall	LAN921	외국인을위한한국어1	Korean for Foreigners1	Y	Liberal Arts	5	4	2	Jeongsoo, Ha
73	Spring / Fall	LAN931	외국인을위한한국어2	Korean for Foreigners2	Y	Liberal Arts	5	4	2	Ganghee, Kim
74	Spring	SHA160	자기개발세미나	Self Development Seminar	Y	Liberal Arts	3	3	0	Aekyung, Han
75	Spring / Fall	SHA271	영어연극	English Drama	Y	Liberal Arts	3	3	0	Yongseok, Kim
76	Spring / Fall	SHA941	한국인과한국사회	Korean people and society	Y	Liberal Arts	3	3	0	Yoonsang, Jang

\* There is possibility of difference between the courses information and open course.

## Syllabus for Korean people and society

<b>Course</b>	Korean people and society	<b>Course Code</b>	SHA941	<b>Semester</b>	Spring /Fall	<b>Credit</b>	3
<b>Target</b>	All Undergraduate						

<b>Professor</b>	Yoongsang, Jang	<b>E-mail</b>	ysjang@kut.ac.kr
<b>Prerequisite</b>			
<b>Abstract</b>	<p>The course has been designed for the international students who want or need to know about 'Korean people and society' so that they get to understand them better without cultural misunderstanding or prejudice: for example, Koreans are socially conservative; Koreans are shy and reserved, and don't know how to have fun; Koreans are excessively proud, and believe their country to be the best in the world; all Koreans want North-South reunification; and Koreans are untrustworthy and difficult to deal with in business. This course also pursues what's behind Koreans' everyday talks or behaviors: things that make them tick. In this course, the student get to know how foreigners see their country, or how Korean culture is depicted from the eye of those who have made a special life in Korea. While this course is mainly for international students, Korean students can take this course, too. For they are supposed to expose themselves more often than ever to various cross-cultural encounters. Since they are expected to have opportunities to talk about 'Korean people and society' in one way or another either home or abroad, this course will help them getting ready for such communicative situations in advance. So the course plans on creating cross-cultural learning experiences through diverse classroom activities.</p>		

<b>Evaluation Portion</b>	<b>Attendance</b>	<b>Homework</b>	<b>Mid-Term exam</b>	<b>Final-Term exam</b>	<b>Others</b>		
	10	10	20	40	20		
	<b>Goal</b>			<b>Achievement method</b>		<b>Evaluation Method</b>	
<b>Details</b>	Students will be able to use proper materials and sites where they can find useful information about Korean culture and history.			Lecture and group discussion with assigned topics			
	Students will be able to understand the socio-cultural background of Korean people and society through assigned readings and in the process of being ready for their presentation on given topics.			Lecture and group discussion with assigned topics		Participation, Presentation, Term paper	
	Students will be able to make a presentation about a certain aspect of Korean society which they think is different from theirs.			Lecture and group discussion with assigned topics		Participation, Presentation, Term paper	
	Students will be able to write a critical positioning paper about Korean culture and history with reference to their own society.			Lecture and group discussion with assigned topic		Participation, Presentation, Term paper	
	Students will be able to perform cooperative task with the classmates in the form of pair or group work with regard to searching information, preparing presentations, etc.			Lecture and group discussion with assigned topic		Participation, Presentation, Term paper.	
<b>Teaching Materials</b>	Korea: The Impossible Country. Daniel Tudor. (2012). Tuttle.						
	Cultural Landscapes of Korea. The Academy of Korean Studies Press. 2012.						
<b>Reference</b>	The Koreans: Who They Are, What They Want, Where Their Future Lies. Michael Breen. (2004). Thomas Donne Books.						
	Arirang TV (Korea's Global English Broadcasting Service)						
	Facts of Korea: The Foreign Experience in the Land of the Morning Calm. Richard Harris. Hollym. 2004						
	Notes on Things Korean. Suzanne Crowder Han. Hollym. 2000.						

## Learning Plan Learning Contents

Week	Learning Contents	Note
1	Introduction, A Brief History of Korea, and Epilogue "Where is the Champagne?"	
2	The making of Korean culture: Shamanism and the Spirit World	Assigned readings
3	Everyday Life: Buddhism	Assigned readings
4	Religion and Ritual: Confucianism, or Field Trip to Independence hall	Assigned readings
5	Korean Culture in the Era of Globalization: Christianity	Assigned readings
6	Mordern Housing, Multinational trends in Food: Capitalism with a Korean Face	Assigned readings
7	Transnational Fashion, Transportation and Consumption: Democracy beyond Asian Values	Assigned readings
8	Mid term week	
9	Changes in the countryside, Family and Marriage: Jeong, the Invisible hug	Assigned readings
10	Education: Competition	Assigned readings
11	Leisure and Quality of Life: Chemyon, or Face	Assigned readings
12	Localization and Revival of Local cultures: Han and Heung	Assigned readings
13	Environment vs. Development: From Clan to Nuclear Family	Assigned readings
14	Information Technology, Hallyu Culture: Neophilia	Assigned readings
15	11. Multicultural Society	Assigned readings
16	Final Week	

## Syllabus for English Drama

<b>Course</b>	English Drama	<b>Course Code</b>	SHA271	<b>Semester</b>	Spring / Fall	<b>Credit</b>	3
<b>Target</b>	All Undergraduate						

<b>Professor</b>	Yongseok, Kim	<b>E-mail</b>	yongkim@kut.ac.kr
<b>Prerequisite</b>			
<b>Abstract</b>	<p>The purpose of this course is to reduce the anxiety of English, and also make students motivated. Through the practice based on sitcom drama or other traditional plays, students can get their opportunity to use English naturally. Finally, it will make them interested in English and also it will affect their language abilities. I believe that the more chances students speak out in English, the better communication ability they have. Students will be corrected their pronunciation and this course will require them to play the drama that they would select themselves at the end of the semester. Of course, they will be trained how to act on stage. They will also prepare a lot of props for their playing drama. They will communicate with the other people. If students does not have any confidence for English, I recommend this course strongly.</p>		

<b>Evaluation Portion</b>	<b>Attendance</b>	<b>Homework</b>	<b>Mid-Term exam</b>	<b>Final-Term exam</b>	<b>Others</b>		
	<b>Goal</b>			<b>Achievement method</b>		<b>Evaluation Method</b>	
<b>Details</b>	The improvement of the communication ability in English  The ability to understand the various culture and have tolerance in other different culture			Stage Performance & Lecture			

## Learning Plan Learning Contents

<b>Week</b>	<b>Learning Contents</b>	<b>Note</b>
1	Introduction	
2	The Selection of the play	
3	The Analysis of the Play	
4	Reading 1	
5	Reading 2	
6	Casting and Reading	
7	Reading and Blocking	
8	Blocking2	
9	Character Analysis	
10	Part Practice	
11	Part Practice	
12	Run Through	
13	Detail	
14	Rehearsal	

15	Performance	
16		

# Syllabus for Korean for Foreigners 1

<b>Course</b>	Korean for Foreigners 1	<b>Course Code</b>	LAN921	<b>Semester</b>	Spring / Fall	<b>Credit</b>	5
<b>Target</b>	All Undergraduate						

<b>Professor</b>	Jeongsoo, Ha	<b>E-mail</b>	
<b>Prerequisite</b>			
<b>Abstract</b>	Basic Korean language course for foreign student Listening(Hearing), Speaking, Writing, Reading of basic Korean. Understanding of Korean culture.		

Evaluation Portion	Attendance	Homework	Mid-Term exam	Final-Term exam	Others		
	20	30	20	30			
	Goal			Achievement method		Evaluation Method	
<b>Details</b>	Listening(Hearing) of basic noun and expression			Repeat Excercise		any time test	
	Speaking of relative situation			Repeat Excercise		any time oral test	
	Writing of oneself			Repeat Excercise		an interview test	
	Reading of basic Korean.			Repeat Excercise		an interview test	
	Understanding of Korean culture.			Feild Experience Learning, Watching movie etc		final report	
<b>Teaching Materials</b>	세종한국어1						
	세종한국어2						

## Syllabus for Introduction to Linguistics

<b>Course</b>	Introduction to Linguistics	<b>Course Code</b>	LAN481	<b>Semester</b>	Spring / Fall	<b>Credit</b>	3
<b>Target</b>	Industrial Management 1 <sup>st</sup> grade						

<b>Professor</b>	Jinhyung, Kim	<b>E-mail</b>	kimjin@kut.ac.kr
<b>Prerequisite</b>			
<b>Abstract</b>	<p>This class is to present non-linguistics students with an introduction to the essential principles and applications of linguistic theory. Through this class, the students will have a basic understanding of linguistics' sub-fields: phonetics, phonology, morphology, syntax, and semantics. In addition, this class deals with language variation and language acquisition as well. The study of linguistics will surely bring to light the bases of human languages including English.</p>		

Evaluation Portion	Attendance	Homework	Mid-Term exam	Final-Term exam	Others		
	10	20	35	35			
<b>Teaching Materials</b>	Frank Parker & Kathryn Riley. 2009. Linguistics for Non-linguists.						
	Various PPT materials						
<b>Reference</b>	KoreaTech Pride Lecture Packet						
	Syntactic structures						
	Phonology						
	Morphology						

### Learning Plan Learning Contents

Week	Learning Contents	Note
1	1. Introduction	
2	2. Pragmatics	language problem
3	3. Semantics	language problem
4	4. Syntax	language problem
5	5. Morphology	field works
6	6. Phonology	Cardinal vowels
7	Review and Exercises	language problem
8	Mid-term Test	
9	7. Language processing	language problem
10	8. Language Variation/ 9. Language Change	UCLA lecture
11	10. First-language acquisition	language problem
12	11. Second-language acquisition	language problem
13	12. Written language	invited lecture

14	13. The neurology of language	language problem
15	Make-up class	Make-up Class
16	Final Test	



## Syllabus for English Debate and Presentations

<b>Course</b>	English Debate and Presentations	<b>Course Code</b>	LAN471	<b>Semester</b>	Spring	<b>Credit</b>	3
<b>Target</b>	All Undergraduate						

<b>Professor</b>	James Robertson	<b>E-mail</b>	
<b>Prerequisite</b>			
<b>Abstract</b>	This course trains learners to communicate clearly and persuasively, with an emphasis on public speaking.		

Evaluation Portion	Attendance	Homework	Mid-Term exam	Final-Term exam	Others		
	20	20	30	30			
	Goal			Achievement method		Evaluation Method	
<b>Details</b>	Persuasive speaking ability			Extensive practice and exercises with a wide range of selected topics.		The conversion of selected factual data into a compelling case for change.	
	Overall skill with the principles of effective speaking			Concentrated study of each Principle, followed by practical exercises and constructive feedback.		Following a lecture phase, students will perform tasks in which they differentiate between good and bad examples of the principle in action, correct the bad examples and then receive formative feedback on their efforts.	
	Ability to tell a memorable story			Focused analysis of the features of brief, compelling storytelling, followed by practical exercises and constructive feedback.		The conversion of selected factual data into a compelling story.	
	Ability to craft an effective message			Focused analysis of the features of effective communication, followed by practical exercises and constructive feedback.		Following a lecture phase, students will perform tasks in which they differentiate between good and bad examples of communication, correct the bad examples and then receive formative feedback on their efforts.	
	Skill in supporting the talk with visuals and other secondary aids			Learners will analyse select examples of visuals and other aids to identify the essential qualities of effective speaking aids.		The conversion of selected factual data into compelling visual aids.	
<b>Teaching Materials</b>	This course trains learners in communication skills, and assesses learners' ability to employ these skills under realistic conditions.						

## Learning Plan Learning Contents

Week	Learning Contents	Note
1	Course Overview	This session will preview the course principles taught in the rest of the course, and gently assess learners initial speaking ability.
2	Craft a clear message 1	The ability to be clear and concise is vital in public speaking, especially for second language learners.
3	Craft a clear message 2	
4	Engage curiosity 1	Audiences can have brief attention spans. How can speakers evoke interest in their listeners?
5	Engage curiosity 2	
6	Build credibility 1	Presentations do not always allow speakers to develop convincing arguments. They need ways to win trust.
7	Build credibility 2	
8	Midterm exam	Students will give a presentation, using the skills they have already practiced.
9	Engage emotions 1	Research suggests that people make decisions based more on emotion than on reason. Speakers need to know this.
10	Engage emotions 2	
11	Craft stories 1	Stories are more memorable than facts. Memorable ideas have greater influence.
12	Craft stories 2	
13	Inspire with images 1	Visual aids should never be the main focus of a talk; a speaker should never be over-reliant on technology. However, a powerful image can enhance any presentation.
14	Inspire with images 2	
15	Course review	Learners will review the course contents.
16	Final exam	Students will give a presentation, using all the skills they have practiced.

## Syllabus for Advanced English Writing

<b>Course</b>	Advanced English Writing	<b>Course Code</b>	LAN362	<b>Semester</b>	Spring /Fall	<b>Credit</b>	3
<b>Target</b>	All Undergraduate						

<b>Professor</b>	Ashley D Stuenzi	<b>E-mail</b>	astuenzi@koreatech.ac.kr
------------------	------------------	---------------	--------------------------

<b>Prerequisite</b>	
<b>Abstract</b>	The goal of this course is to improve students' English writing skills. The majority of the class will focus on the key components of academic writing as well as producing several different types of essays in English. Some of the topics covered will include paragraph/sentence structure, thesis statement construction, proper form of an essay, editing/revising, peer reviews, citations, business writing, and timed writing. Students will be expected to submit a writing portfolio at the end of the semester which is a cumulative collection of their writing assignments over the entirety of the class. For the final exam, students will demonstrate their understanding of proper writing techniques by submitting a lengthier essay on a topic of their choosing.

Evaluation Portion	Attendance	Homework	Mid-Term exam	Final-Term exam	Others		
	10	30	30	30			

	Goal	Achievement method	Evaluation Method
<b>Details</b>	To improve sentence structure	Grammar and Syntax practice	In class writing and lectures
	To improve paragraph writing	Grammar and Syntax practice expanded	In class writing and lectures
	To learn business writing	Practice formal language writing	In class writing and lectures
	To learn essay construction	Practice organization and structure	In class writing and lectures
	To learn timed writing	Practice timed writing in the classroom, give strategies	In class writing and lectures
<b>Teaching Materials</b>	The professor designs the materials for this class though "The Essay" by Cambridge Uni Press is often used as reference.		

### Learning Plan Learning Contents

Week	Learning Contents	Note
1	Introductions & Writing Sample	
2	Essay Writing Basics -- What is an essay? Format/organization, purpose, audience, writing process, topics	
3	In-Class Writing: "Before I die, I want to..." • Current Events #1 Responding to a Reading • Creating a good thesis statement	
4	Informative Essays Introduction to Informative Essays Topic sentences, transition words, intros/hooks, outlining	
5	Informative Essay Peer Review Peer Review with new artnerfragments /run-ons One on one review with prof	
6	Compare/Contrast Essays • Introduction to Compare/Contrast Essays	
7	Compare/Contrast Essay Peer Review Current Events #2 Review for Midterm Exam	
8	Midterm	
9	Persuasive Essays • Introduction to Persuasive Essays • Language Focus: arguments and counterarguments, types of support, controversial language, and citations	

10	Persuasive Essay Peer Review Formal & Informal Letter Writing Start Timed Writing - TOEIC	
11	Timed Writing - TOEFL	
12	Timed Writing - TOEIC	
13	Business Writing	
14	Business Writing	
15	Writing Workshops	
16	Final Exam	

## Syllabus for Basic English Conversation 1

<b>Course</b>	Basic English Conversation 1	<b>Course Code</b>	LAN337	<b>Semester</b>	Spring /Fall	<b>Credit</b>	1
<b>Target</b>	All Undergraduate 1 <sup>st</sup> grade						

<b>Professor</b>	Ashley D Stuenzi	<b>E-mail</b>	astuenzi@koreatech.ac.kr
<b>Prerequisite</b>			
<b>Abstract</b>	The goal of this course is to improve students' speaking, writing and listening skills. The course will focus on vocabulary, conversation strategies, and improving grammar accuracy. Individual classes will be based on topics in order to emphasize target language, reinforce situation specific comprehension, and improve fluency. For all assignments and exams, students will be graded according to correct use of target language, fluency and grammar accuracy. Exams will have both a written and speaking		

Evaluation Portion	Attendance	Homework	Mid-Term exam	Final-Term exam	Others		
	10	30	30	30			
	Goal			Achievement method		Evaluation Method	
<b>Details</b>	To improve communication			Group and Pair work		Practice in Class	
	To improve grammar accuracy			Lectures by Professor		Practice in Class	
	To improve listening skills			Practice Listening Exercises		Practice in Class	
	To improve writing skills			Homework - Current Events Response Homework		Homework	
	To improve overall fluency			Group and Pair Work		Practice in Class	
<b>Teaching Materials</b>	Interchange Level 1						

### Learning Plan Learning Contents

Week	Learning Contents	Note
1	Introductions & Speaking Practice: Interview with professor	
2	Greetings & Introductions Grammar : Wh-questions, statements with be, yes/no questions, subject pronouns	
3	Jobs Grammar: Simple present, time expressions (prepositions of time), routines	
4	Shopping Grammar: Demonstratives, comparisons with adjectives	
5	Music, Movies, & Entertainment Grammar: Simple present questions with "do", modal verb "would", object pronouns	
6	Families Grammar: Present continuous, quantifiers	
7	Midterm Speaking Exam Preparation	
8	Midterm Exam	
9	Neighborhoods, Apartments, & Houses Grammar: There is/there are, prepositions of place, quantifier questions (count/non-count nouns)	
10	Memories & Childhood Grammar: Simple Past, short answers with regular & irregular verbs, past of be	

11	Food Grammar: Modal verbs (can, may), ordering food	
12	Health Grammar: Asking for/giving advice, talking about health problems	
13	ing “going to” and “will”	
14	Presentations	
15	Final Speaking Exam Preparation	
16	Final Exam	

## Syllabus for English Conversation2

<b>Course</b>	English Conversation 2	<b>Course Code</b>	LAN336	<b>Semester</b>	Spring / Fall	<b>Credit</b>	1
<b>Target</b>	All Undergraduate						

<b>Professor</b>	Ashley D Stuenzi	<b>E-mail</b>	astuenzi@koreatech.ac.kr
------------------	------------------	---------------	--------------------------

<b>Prerequisite</b>	
<b>Abstract</b>	The goal of this course is to improve students' speaking, writing and listening skills. The course will focus on vocabulary, conversation strategies, and improving grammar accuracy. Individual classes will be based on topics in order to emphasize target language, reinforce situation specific comprehension, and improve fluency. For all assignments and exams, students will be graded according to correct use of target language, fluency and grammar accuracy. Exams will have both a written and speaking

Evaluation Portion	Attendance	Homework	Mid-Term exam	Final-Term exam	Others		
	10	30	30	30			
	Goal			Achievement method		Evaluation Method	
<b>Details</b>	To improve communication			Group and Pair work		Practice in Class	
	To improve grammar accuracy			Lectures by Professor		Practice in Class	
	To improve listening skills			Practice Listening Exercises		Practice in Class	
	To improve writing skills			Homework - Current Events Response Homework		Homework	
	To improve overall fluency			Group and Pair Work		Practice in Class	

## Learning Plan Learning Contents

Week	Learning Contents	Note
1	Introductions: Interview with professor & class	
2	Hobbies & Activities Grammar Focus: present perfect continuous / infinitives and gerunds	
3	Travel Grammar Focus: 2nd Order Conditional	
4	Media Grammar Focus: subordinate and relative clauses	
5	Relationships & Experiences Grammar Focus: phrasal verbs / past continuous	
6	*1st Situational Dialogue Presentation	
7	Midterm Exam Review	
8	Midterm Exam	
9	Social Issues Grammar Focus: reading / discussion	
10	Public Health Grammar Focus: active and passive voice	
11	Law & Policy Grammar Focus: past perfect / reported speech	

12	Decisions Grammar Focus: 3rd order conditional	
13	Current Events Grammar Focus: reading / discussion / presentation	
14	2nd Situational Dialogue Presentation	
15	Final Exam Review	
16	Final Exam	



## Syllabus for English Conversation1

<b>Course</b>	English Conversation 1	<b>Course Code</b>	LAN335	<b>Semester</b>	Spring /Fall	<b>Credit</b>	1
<b>Target</b>	Liberal Arts						

<b>Professor</b>	Wayne Jackson	<b>E-mail</b>	waynekorea@yahoo.com
<b>Prerequisite</b>			
<b>Abstract</b>	This is a course to help students improve their confidence when using English. Essential elements of grammar are covered to help students speak clearly and conversation techniques and topics are introduced to help students speak more freely and naturally.		

<b>Evaluation Portion</b>	<b>Attendance</b>	<b>Homework</b>	<b>Mid-Term exam</b>	<b>Final-Term exam</b>	<b>Others</b>		
	10	45	25	25			
<b>Details</b>	<b>Goal</b>			<b>Achievement method</b>		<b>Evaluation Method</b>	
	improve communication			speaking activities		Role play and discussion.	
	improve confidence			exposure to English outside the class		free talking and video project	

## Learning Plan Learning Contents

<b>Week</b>	<b>Learning Contents</b>	<b>Note</b>
1	Introductions	
2	Agreeing and disagreeing, prepositions	
3	Comparatives and superlatives, Modal verbs	
4	Present perfect, conditionals	
5	Too, very, enough.	
6	Video Presentations	
7	Describing pictures	
8	Midterm exams	
9	Family, Relationships	
10	Friendship, love dating	
11	First impressions, Prejudice.	
12	Travel, success	
13	Parties ,drinking and having fun	
14	Apologizing and complaining	
15	Role plays and Revision	
16	Final Exams	

## Syllabus for General Physics and Experiment 1

<b>Course</b>	General Physics and Experiment 1	<b>Course Code</b>	BSM313	<b>Semester</b>	Spring	<b>Credit</b>	4
<b>Target</b>	Liberal Arts						

<b>Professor</b>	Un-hak, Hwang	<b>E-mail</b>	uhhwang@koreatech.ac.kr
<b>Prerequisite</b>			
<b>Abstract</b>	This subject is an introductory course of Physics and is concerned with mechanics, fluid mechanics, thermodynamics, and wave mechanics. We study the fundamental quantities and basic principles of Physics with experiments.		

<b>Evaluation Portion</b>	<b>Attendance</b>	<b>Homework</b>	<b>Mid-Term exam</b>	<b>Final-Term exam</b>	<b>Others</b>		
	10	10	40	40			
<b>Details</b>	<b>Goal</b>			<b>Achievement method</b>		<b>Evaluation Method</b>	
	Understanding of fundamental concepts of mechanical quantities			Derivations of the mathematical equations for laws			
	Understanding and application of the linear and circular motion			Preview od for subjects and experiments		Review report and result report	
	Understanding of the Newtonian motions			Introduction of practical examples for theory and experiments		Connected to exam problems	
	Understanding of the oscillations and waves						
Understanding of the thermodynamics							
<b>Teaching Materials</b>	Physics for Scientists and Engineers with Modern Physics, 9th ed.(Serwayand Jewett, International Edition 2014)						
	Experiments of General Physics (BooksHill, 2017)						

## Learning Plan Learning Contents

Week	Learning Contents	Note
1	Introduction	
2	One-dimensional motions	
3	Vectors	
4	Two and three dimensional motions	
5	Forces,Newton's laws	
6	Mechanics of the rigid bodies	
7	Works,energies	
8	Midterm Exam	
9	Oscillations	
10	Waves	
11	Properties of waves	
12	Statiscal equilibriums	
13	Fluid mechanics	
14	Theomodynamics1	
15	Thermodynamics2	
16	Final exam	

## Syllabus for Discrete Mathematics

<b>Course</b>	Discrete Mathematics	<b>Course Code</b>	BSM180	<b>Semester</b>	Spring	<b>Credit</b>	3
<b>Target</b>	Liberal Arts						

<b>Professor</b>	Yungbok, Joo	<b>E-mail</b>	ybjoo@koreatech.ac.kr
<b>Prerequisite</b>			
<b>Abstract</b>	<p>In order to be able to formulate what a computer system is supposed to do, or to prove that it does meet its specification, or to reason about its efficiency, one needs the precision of mathematical notation and techniques. For instance, to specify computational problems precisely one needs to abstract the detail and then use mathematical objects such as sets, functions, relations, orders, and sequences. To prove that a proposed solution does work as specified, one needs to apply the principles of mathematical logic, and to use proof techniques such as induction. And to reason about the efficiency of an algorithm, one often needs to count the size of complex mathematical objects. The Discrete Mathematics course aims to provide this mathematical background.</p>		

Evaluation Portion	Attendance	Homework	Mid-Term exam	Final-Term exam	Others		
	10	30	30	30			
<b>Teaching Materials</b>	이산수학 및 응용, 한티미디어, 주영복 외 옮김. 2015, 4th Edition Discrete Mathematics With Application, CENGAHE Learning, Susanna S. Epp						

## Learning Plan Learning Contents

Week	Learning Contents	Note
1	Chapter 0. Course Orientation	
2	Chapter 1. Speaking Mathematically	Main Textbook,
3	Chapter 2. The Logic of Compound Statements	Main Textbook, Quiz
4	Chapter 3. The Logic of Quantified Statements	Main Textbook, Quiz
5	Chapter 4. Elementary Number Theory and Methods of Proof	
6	Chapter 5. Sequencies, Mathematical Induction and Recursion	Main Textbook, Quiz
7	Chapter 6. Set Theory	Main Textbook, Quiz
8	Midterm Exam	
9	Chapter 7. Functions	Main Textbook, Quiz
10	Chapter 8. Relations	Main Textbook, Quiz
11	Chapter 9. Counting and Probability	Main Textbook, Quiz
12	Chapter 10. Graphs and Trees	Main Textbook, Quiz
13	Chapter 11. The Efficiency of Algorithms	Main Textbook, Quiz
14	Chapter 12. Regular Expressions and Finite-State Automata	Main Textbook, Quiz
15	Final Exam	

## Syllabus for Linear Algebra

<b>Course</b>	Linear Algebra	<b>Course Code</b>	BSM171	<b>Semester</b>	Spring	<b>Credit</b>	3
<b>Target</b>	Liberal Arts						
<b>Professor</b>	Jaedong, Sim		<b>E-mail</b>	sjd@kut.ac.kr			
<b>Prerequisite</b>							
<b>Abstract</b>	This course will cover the basic concepts of systems of linear equations and their solutions. The first half of the course will emphasize calculation techniques, with applications to physics, economics, applied mathematics and engineering. The second half of the course will cover matrices as linear transformation						
<b>Evaluation Portion</b>	<b>Attendance</b>	<b>Homework</b>	<b>Mid-Term exam</b>	<b>Final-Term exam</b>	<b>Others</b>		
	5	25	35	35			
	<b>Goal</b>			<b>Achievement method</b>		<b>Evaluation Method</b>	
<b>Teaching Materials</b>	A Linear Algebra :A Modern Introduction, David poole						
<b>Reference</b>	선형대수학, 경문사, 김광환 외 7인 역						
	Linear Algebra and Its Applications, David C. Lay						

## Learning Plan Learning Contents

Week	Learning Contents	Note
1	Vectors	Indicated Problem, discussing
2	Systems of Linear Algebra	Indicated Problem, discussing
3	Systems of Linear Algebra	Indicated Problem, discussing
4	Matrices	Indicated Problem, discussing
5	Matrices	Indicated Problem, discussing
6	Matrices	Indicated Problem, discussing
7	Eigenvalues	Indicated Problem, discussing
8	Review and Midterm Exam	
9	Eigenvectors	Indicated Problem, discussing
10	Orthogonality	Indicated Problem, discussing
11	Orthogonality	Indicated Problem, discussing
12	Vector Spaces	Indicated Problem, discussing
13	Vector Spaces	Indicated Problem, discussing
14	Distance and Approximation	Indicated Problem, discussing
15	Distance and Approximation	Indicated Problem, discussing
16	Review and Final Exam	

## Syllabus for Statistic Quality Control

<b>Course</b>	Statistic Quality Control		<b>Course Code</b>	IMC641	<b>Semester</b>	Fall	<b>Credit</b>	3
<b>Target</b>	Industrial Management 2 <sup>nd</sup> , 3 <sup>rd</sup> ,4 <sup>th</sup> grade							
<b>Professor</b>	Janghee, Lee		<b>E-mail</b>	janghlee@kut.ac.kr				
<b>Abstract</b>	This course is designed to give students the opportunity to understand the concepts, theories and practical tools of statistical quality control, which is basic management system for controlling process, product and system and maximizing business profits. To achieve this goal, this course focuses on understanding and applying a number of concepts, theories and methodologies of statistical quality control. This lecture offers effective learning to the students to prepare the engineer quality							
<b>Evaluation Portion</b>	<b>Attendance</b>	<b>Homework</b>	<b>Mid-Term exam</b>	<b>Final-Term exam</b>	<b>Others</b>			
	5	25	35	35				
	<b>Goal</b>			<b>Achievement method</b>		<b>Evaluation Method</b>		
<b>Details</b>	Understanding of Basic Six Sigma Theory					Tests & Class-activity		
	Understanding of Six Sigma Application Methodology					Tests & Class-activity		
<b>Reference</b>	minitab software homepage <a href="http://www.minitab.com">www.minitab.com</a>							

### Learning Plan Learning Contents

Week	Learning Contents	Note
1	Introduction	
2	Quality Basics	
3	Quality Basics	
4	Control charts (Xbar-R, Xbar-S)	
5	Control charts using Minitab Software	
6	Control charts (Individual- Moving Range)	
7	Control charts using Minitab Software	
8	Mid-Term Examination	
9	Control charts using Minitab Software	
10	Control charts (P, NP, C, U)	
11	Control charts using Minitab Software	
12	Process capability	
13	process capability using Minitab Software	
14	Acceptance sampling	
15	acceptance sampling using Minitab Software	
16	Make-Up Class / Final Examination	

## Syllabus for Technology Management

<b>Course</b>	Technology Management	<b>Course Code</b>	IMC602	<b>Semester</b>	Fall	<b>Credit</b>	3
<b>Target</b>	Industrial Management 3 <sup>rd</sup> , 4 <sup>th</sup> grade						

<b>Professor</b>	Byeongkeun, Kim	<b>E-mail</b>	b.kim@kut.ac.kr
<b>Abstract</b>	<p>This course aims at providing students knowledge to understand and the skills to manage technological innovation at the operation and strategic levels. It covers issues of importance of technological innovation, industrial dynamics of innovation (sources of innovation, pattern and types of innovation, standard battle, timing of entry), formulating technological innovation strategy (defining the organization's strategic direction, selecting innovation projects, collaborating strategies, protecting innovation), implementing technological innovation strategy (organizing for innovation, NPD management, NPD team management, deployment strategy). This course will be organized into lectures and seminars. Students are expected to participated in team project and presentation, and submit short</p>		

<b>Evaluation Portion</b>	<b>Attendance</b>	<b>Homework</b>	<b>Mid-Term exam</b>	<b>Final-Term exam</b>	<b>Others</b>		
	20	20	30	30			
	<b>Goal</b>			<b>Achievement method</b>		<b>Evaluation Method</b>	
<b>Teaching Materials</b>	Melissa A. Schilling, Strategic Management of Technological Innovation, McGraw-Hill/Irwin, New York, 2010. (SMTI)						
<b>Reference</b>	<p>M. Dodgson et al. The Management of Technological Innovation, Oxford Univ. Press (MTI)</p> <p>P. Trott (2005), Innovation Management and New Product Development, 3rd edition, Harlow: FT Prentice Hall (IMNPD)</p>						

### Learning Plan Learning Contents

week	Learning Contents	Note
1	Introduction	
2	What is the Management of Technology & Innovation and Why is it Important?	
3	Sources of Innovation	
4	Types and Patterns of Innovation	short report
5	Standards Battles and Design Dominance	
6	Timing of Entry	
7	Innovation Strategy	
8	Mid-term test	
9	Choosing Innovation Projects	
10	Collaborating Strategies	short report
11	Protecting Innovations	
12	Organizing for Innovation	
13	Managing the New Product Development Process	
14	Managing New Product Development Teams	
15	Commercialization of technology & Innovation	
16	Test	

## Syllabus for Global strategies for high-tech industries

<b>Course</b>	Global strategies for high-tech industries	<b>Course Code</b>	IMA880	<b>Semester</b>	Spring	<b>Credit</b>	3
<b>Target</b>	Industrial Management 2 <sup>nd</sup> , 3 <sup>rd</sup> , 4 <sup>th</sup> grade						

<b>Professor</b>	Olga A. Shvetsova	<b>E-mail</b>	shvetsova@koreatech.ac.kr
<b>Prerequisite</b>			
<b>Abstract</b>	<p>This course is flip-learning course. It means that most of in-class activities refer to practical skills, lecture time is reduced; students spend less time in class. Students have great opportunity to discover some fields themselves and discuss them in class with Professor and classmates. The course examines the formation and implementation of business strategies for High-Tech companies in a global environment. The basic knowledge of globalization; innovative global strategies; high-tech corporations' innovative behavior; cooperative strategies in global environment, technological innovations in global environment are discussed. The study methods are environment's analysis of the international industrial company and discussion how to create strategical plan for international company. The procedure for the selection of the foreign markets is discussed. Students study the processes of company's competitive advantage formation and its sustainable development in global markets. The course is full of different learning materials and provides case study, business games, Q&amp;A, discussions..</p>		

Evaluation Portion	Attendance	Homework	Mid-Term exam	Final-Term exam	Others		
	30	20	20	30			
	Goal			Achievement method		Evaluation Method	
<b>Details</b>	Provide an understanding of the scope and function of international business strategy theory and practice in high-tech industries			Research		Written assignment	
	Develop a comprehensive course of action for high-tech global business using formal decision making processes			Case study		Written assignment	
	Apply personal and interpersonal skills appropriate to being an effective member of an international business team			Discussion in class		PPT presentation	
	increase an awareness and understanding of preparing an international strategical plan for high-tech global corporation			Article review		Oral discussion	
<b>Teaching Materials</b>	Kiefer Lee & Steve Carter "Global Marketing Management", 3d edition, Oxford University Press, 2012						
	International business, 8 th edition, by Czinkota, Ronkainen and Moffett, John Wiley & Sons Inc. publishing, 2011						



## Learning Plan Learning Contents

Week	Learning Contents	Note
1	Introduction. Globalization: changes and new challenges for industrial markets	in-class
2	The scope and challenge of global business	
3	Internationalization theories. Global innovative environment	
4	Development of the industrial firm's international competitiveness	
5	Decision-making in Global business: global market research	
6	Approaches to the choice of entry mode	
7	International business entry strategies	
8	Mid-term exam	in-class
9	Implementing global business strategies for high-tech companies	
10	Global service marketing. Corporate governance and reputation of global industrial corporations	
11	Terms of doing business. Strategy planning in global innovative environment	
12	Global communication strategies for high-tech corporations	
13	Global partnership program	
14	Global trade policy	
15	Conclusion. New sources of competitive advantages in global business. Innovations perspectives	
16	Final exam	in-class

## Syllabus for High-tech Marketing

<b>Course</b>	High-tech Marketing	<b>Course Code</b>	IMA730	<b>Semester</b>	Fall	<b>Credit</b>	3
<b>Target</b>	Industrial Management 3 <sup>rd</sup> , 4 <sup>th</sup> grade						

<b>Professor</b>	Olga A. Shvetsova	<b>E-mail</b>	shvetsova@koreatech.ac.kr				
<b>Prerequisite</b>							
<b>Abstract</b>	<p>This class will explore concepts and practices related to marketing of technology driven products &amp; innovations. The unique, fast-paced environment of high-tech means that standard marketing strategies must be modified. The class will explore a range and diversity of industries and contexts. Focus will be placed on business-to-business high-tech contexts. Issues for both small and big business will be addressed. The course will provide a balance between conceptual discussions and applied/hands-on analysis. Students will develop knowledge of the complexities in developing high-tech marketing strategies, as well as tools and concepts that can be used to manage those complexities. Students will leave the course with skills needed to develop and implement effective high-tech marketing strategies.</p>						

Evaluation Portion	Attendance	Homework	Mid-Term exam	Final-Term exam	Others		
	40	20	20	20			
	Goal			Achievement method		Evaluation Method	
<b>Details</b>	Defining characteristics of high-technology industries			comprehensive overview of high-technology industries		Class activity (Q&A)	
	Marketing implications of different types and patterns of innovation			Site Visits - Graduate student must conduct 3 independent site visits with organizations/companies relevant to their chosen area of study		Written assignment	
	Investigate tools used to gather marketing research/intelligence in technology-driven industries			Students will conduct extensive data collection and analysis in their chosen area of study		Case study (group activity)	
	Find the regulatory and ethical considerations in technological arenas			Students will conduct extensive data collection and analysis in their chosen area of study		Article review	
	Exercise tools of adopting a customer-orientation			comprehensive overview of customer's needs		Discussion	
<b>Teaching Materials</b>	flipp-learning, case study, business game, discussion, field research						
<b>Reference</b>	Mohr Sengupta Slater "Marketing of High-Technology products and innovations", 3d ed. 2014						
	Naresh K. Malhotra "Marketing research", 6th ed., 2010						
	Nigel Bradley "Marketing research: tools and techniques", 2010						

## Learning Plan Learning Contents

Week	Learning Contents	Note
1	Introduction to the World of High-Tech Marketing	
2	Strategic Market planning in high-tech firms	
3	Culture and climate considerations for high-tech companies	
4	Market orientation and cross-functional interaction (R&D marketing)	
5	Partnerships, Alliances and customer relationships	
6	Mid-term exam	
7	Marketing research in high-tech markets	
8	Understanding high-tech customers	
9	Technology and product management	
10	Distribution channels and supply chain management in high-tech markets	
11	Pricing considerations in high-tech markets	
12	Marketing communication tools for high-tech markets	
13	Strategic considerations for the triple bottom line in high-tech companies	
14	Strategic considerations in marketing communications	
15	Future trends of high-tech marketing	
16	Final exam	

## Syllabus for Applications of Market Economic

<b>Course</b>	Applications of Market Economic	<b>Course Code</b>	IMA701	<b>Semester</b>	Spring	<b>Credit</b>	3
<b>Target</b>	Industrial Management 2 <sup>nd</sup> , 3 <sup>rd</sup> , 4 <sup>th</sup> grade						

<b>Professor</b>	Janghee, Lee	<b>E-mail</b>	janghlee@kut.ac.kr				
<b>Prerequisite</b>							
<b>Abstract</b>	This course is designed to give students the opportunity to understand the concepts, theories and practical tools of six sigma management, which is essentially a comprehensive yet flexible management system for achieving, supporting and maximizing business profits. To achieve this goal, this course focuses on understanding and applying a number of concepts, theories and methodologies of Six Sigma which is used in the most Six Sigma projects of private and public industry. This lecture offers effective Six Sigma learning to the students to prepare the Six Sigma Green Belt Certification.						

Evaluation Portion	Attendance	Homework	Mid-Term exam	Final-Term exam	Others		
		5	25	30	40		
	Goal			Achievement method		Evaluation Method	
Details	Understanding of Basic Six Sigma Theory					Tests & Homeworks	
	Understanding of Six Sigma Application Methodology					Term-PROJECT	
Teaching Materials	Handout						
	"Six SIGMA for Dummies" (Gygi, Craig / DeCarlo, Neil 지음, 2012년 10월 16일)						
Reference	6시그마 경영품질 이러닝 웹사이트						
	Six SIGMA for Managers (Brue, Greg / Formisano, Roger A. / Brue Greg 지음, McGraw-Hill, 2002년)						

## Learning Plan Learning Contents

Week	Learning Contents	Note
1	Introduction	
2	Six Sigma Basics	
3	Six Sigma Basics	
4	Process Improvement	
5	Define	
6	Define	
7	Measure	
8	Mid-term exam.	
9	Measure	
10	Analyze	
11	Analyze	
12	Improve	
13	control	
14	final-exam	
15		
16		

## Syllabus for Business English 2

<b>Course</b>	Business English 2	<b>Course Code</b>	IMA506	<b>Semester</b>	Spring /Fall	<b>Credit</b>	3
<b>Target</b>	Industrial Management 3 <sup>rd</sup> ,4 <sup>th</sup> grade						

<b>Professor</b>	Olga A. Shvetsova	<b>E-mail</b>	shvetsova@koreatech.ac.kr				
<b>Prerequisite</b>	Business English 1						
<b>Abstract</b>	The course is designed to provide format documents and oral instruments relevant in a business environment and which help to communicate effectively. Emphasis will be placed on proper keyboarding technique inclusive of spelling, punctuation, capitalization, and word usage. The course will teach students to communicate in a clear, courteous, concise, and correct manner on both personal and professional levels. Competency will be developed in oral, written, social, technological, employment, and organizational communication with listening skills incorporated throughout the semester. Students will complete the course with a greater understanding of the importance of different types of communication technologies and the need for effective communication skills to advance in a business career.						

Evaluation Portion	Attendance	Homework	Mid-Term exam	Final-Term exam	Others		
	40	20	20	20			
	Goal			Achievement method		Evaluation Method	
Details	Analyze types of business communication			All types of Communication		Business game	
	Improve interpersonal communication skills			Class Participation, Group work		Case study, Business game	
	Write business documents that are grammatically correct and use appropriate business style			Written communication		Written assignment	
	Deliver effective business skills in contexts that may require either extemporaneous or impromptu oral presentations			Oral presentation		PowerPoint presentation	
<b>Teaching Materials</b>	business game, discussion, Q&A, case study, written assignment, group project						
<b>Reference</b>	Business Communication Essentials, 9th Edition, by Courtland L. Bovee, John, V. Thill, Pearson Higher Education Publ, 2012						
	Basic business communication, 12th edition, by Lesikar and Flatley, McGraw-Hill Publ, 2010						
	Communication for Business Success (Canadian Edition), on-line publishing by Andy Schmitz, <a href="http://2012books.lardbucket.org/">http://2012books.lardbucket.org/</a> , 2012						
	Effective business communication in organizations, 4th edition, by Michael Fielding, Published by Juta & Company Ltd, 2014						

## Learning Plan Learning Contents

Week	Learning Contents	Note
1	Introduction to Course Meet classmates; self-introductions. The modern trends of business communication	
2	Understanding the main problems in communication process	
3	Modern Technologies to Communicate (Electronic Media) - advantages and disadvantages	
4	Self-presentation	
5	Communication strategies in conflict management	
6	Time-management	
7	Communication in the workplace	
8	Adaptation of communication	
9	Positive and negative business messages	
10	Midterm exam	
11	Sales messages	
12	Thank- you notes	
13	Correctness of communication	
14	Business research methods	
15	Group project	
16	Final exam	

## Syllabus for Business English 1

<b>Course</b>	Business English 1	<b>Course Code</b>	IMA505	<b>Semester</b>	Fall	<b>Credit</b>	3
<b>Target</b>	Industrial Management 2 <sup>nd</sup> ,3 <sup>rd</sup> grade						

<b>Professor</b>	Olga A. Shvetsova	<b>E-mail</b>	shvetsova@koreatech.ac.kr
<b>Prerequisite</b>			
<b>Abstract</b>	<p>The course is designed to provide format documents and oral instruments relevant in a business environment and which help to communicate effectively. Emphasis will be placed on proper keyboarding technique inclusive of spelling, punctuation, capitalization, and word usage. The course will teach students to communicate in a clear, courteous, concise, and correct manner on both personal and professional levels. Competency will be developed in oral, written, social, technological, employment, and organizational communication with listening skills incorporated throughout the semester. Students will complete the course with a greater understanding of the importance of different types of communication technologies and the need for effective communication skills to advance in a business career.</p>		

Evaluation Portion	Attendance	Homework	Mid-Term exam	Final-Term exam	Others		
	40	20	20	20			
	Goal			Achievement method		Evaluation Method	
<b>Details</b>	Analyze communication situations and audiences to make choices about the most effective and efficient way to communicate and deliver messages			Oral Communication		Case study	
	Provide feedback, accept feedback, and use feedback to improve communication skills			Oral Presentations, Class Participation		Written assignment, test	
	Write business documents that are grammatically correct and use appropriate business style			Written communication		Case study	
	Develop effective interpersonal communication skills			Group work Class Participation		Business game	
	Deliver effective business presentations in contexts that may require either extemporaneous or impromptu oral presentations			Oral presentation		PowerPoint presentation	
<b>Teaching Materials</b>	case study, PPT, discussion, business game, written assignment						
<b>Reference</b>	Business Communication Essentials, 9th Edition, by Courtland L. Bovee, John, V. Thill, Pearson Higher Education Publ, 2012						
	Basic business communication, 12th edition, by Lesikar and Flatley, McGraw-Hill Publ, 2010						
	Communication for Business Success (Canadian Edition), on-line publishing by Andy Schmitz, <a href="http://2012books.lardbucket.org/">http://2012books.lardbucket.org/</a> , 2012						
	Effective business communication in organizations, 4th edition, by Michael Fielding, Published by Juta & Company Ltd, 2014						



## Learning Plan Learning Contents

Week	Learning Contents	Note
1	Introduction to Course Meet classmates; self-introductions. The importance of business communication	
2	Understanding the Communication Process/Communicating in a Global Society	
3	Using Technology to Communicate (Electronic Media)	
4	Communicating and Working in Teams	
5	Conflict solving communication	
6	Business etiquette	
7	Writing Effective Business Communication	
8	Speaking for Successful Communication	
9	Making the effective presentations	
10	Midterm exam	
11	Listening with a Purpose	
12	Reading with a Purpose	
13	Marketing communications	
14	Building careers and writing resumes	
15	Negotiation	
16	Final exam	

## Syllabus for SAP Lab

<b>Course</b>	SAP Lab	<b>Course Code</b>	IMA482	<b>Semester</b>	Spring / Fall	<b>Credit</b>	3
<b>Target</b>	Industrial Management 3 <sup>rd</sup> , 4 <sup>th</sup> grade						
<b>Professor</b>	Yongwan, Choi			<b>E-mail</b>	sydhere@me.com		
<b>Prerequisite</b>	Accounting Theory and Practices						
<b>Evaluation Portion</b>	<b>Attendance</b>	<b>Homework</b>	<b>Mid-Term exam</b>	<b>Final-Term exam</b>	<b>Others</b>		
	20	60	10	10			
	<b>Goal</b>			<b>Achievement method</b>		<b>Evaluation Method</b>	
<b>Teaching Materials</b>	SAP manual						
<b>Reference</b>	강의파일 (내용정리, 사례연구, 회계이슈) -> 매주 강의 전 교부						
	남천현, SAP R/3에 기반한 ERP회계론, 신영사, 2006						

## Learning Plan Learning Contents

Week	Learning Contents	Note
1	introduction, transformation using ERP	
2	FCM process overview	
3	ERP process overview	
4	SAP navigation	Homework
5	G/L accounting	Homework
6	MM	Homework
7	Accounts payable(1)	Homework
8	Accounts payable(2)	Homework
9	Accounts Receivable(1)	Homework
10	Accounts receivable(2)	Homework
11	Asset Accounting(AA)	Homework
12	Preparing F/S	Homework
13	Bank accounting	Homework
14	MM overview	Homework
15	CO overview(1) (2)	Homework
16	Practice	

## Syllabus for International Management

<b>Course</b>	International Management	<b>Course Code</b>	IMA442	<b>Semester</b>	Spring /Fall	<b>Credit</b>	3
<b>Target</b>	Industrial Management 3 <sup>rd</sup> , 4 <sup>th</sup> grade						

<b>Professor</b>	Olga A . Shvetsova	<b>E-mail</b>	shvetsova@koreatech.ac.kr
<b>Prerequisite</b>			
<b>Abstract</b>	<p>This course studies the issues involved in conducting business in the international arena including the business environment, global public relations strategies, organizational behavior, research, human resources, ethics, social responsibility, law, and information technology. The nature and economic role of the multinational corporation, including the impact of legal, political, educational, and cultural variables are examined for their influence upon business performance and managerial activity. International Business provides students with key concepts and skills to identify international opportunities/threats, analyze their impact, formulate appropriate strategies and implement applicable action plans to achieve company goals. The course will help students understand today's competitive global environment, marketing, finance and policy. The course examines legal, logistical, organizational and cultural issues in global environment. The course explores the interrelation of government and business across borders and the economic dynamics between countries/regions, including a general overview of the international monetary system, international trade and foreign direct investment. The class also will discuss the strategy of international business and review a few cases studies that epitomize the issues involved in today's global world. In general, the major topics of global business will be discussed to give students a working vocabulary and basic level of knowledge and skills involved in today's global business. Understanding the global economy, therefore, is necessary for all engaged in business and careers regardless of the size or type of business or career endeavor.</p>		

<b>Evaluation Portion</b>	<b>Attendance</b>	<b>Homework</b>	<b>Mid-Term exam</b>	<b>Final-Term exam</b>	<b>Others</b>		
	30	20	20	30			
<b>Details</b>	<b>Goal</b>			<b>Achievement method</b>		<b>Evaluation Method</b>	
	give students the knowledge and understanding of the unique aspects involved doing business internationally on a business, legal and political level			Country research		Written assignment	
	give students a basic understanding of the global monetary system and the evolution of the system. To understand the factors involved in currency exchange rates (which influences international costs and profits) and economic conditions			Case study		Written assignment	
	give students a basic understanding of international trade			Discussion in class		PPT presentation	
	increase an awareness and understanding of the different governmental and non-governmental bodies involved in international business			Article overview		Oral discussion	
	learn the issues involved in entering foreign markets, global production and outsourcing as well as logistics and supply chain issues			Project in small groups		Exercise, business game	
<b>Teaching Materials</b>	International management: managing across borders and cultures, 8 th edition, by Helen Deresky, Pearson publishing, 2014						
	International business, 8 th edition, by Czinkota, Ronkainen and Moffett, John Wiley & Sons Inc. publishing, 2011						

## Learning Plan Learning Contents

Week	Learning Contents	Note
1	Introduction to Course - International management imperative	
2	Global manager's environment	
3	Organization structures of global companies	
4	Cultural context of global management	
5	Ethics in International Business	
6	Strategy for international and global operations	
7	Global market strategies	
8	Midterm exam	
9	Global Investment	
10	Global HRM	
11	1Financial management	
12	International Trade Theories	
13	Logistics and Supply-Chain management in global market	
14	Communication in global environment	
15	Developing a global management. Discussion	
16	Final exam	

## Syllabus for Theory of International Finance

<b>Course</b>	Theory of International Finance	<b>Course Code</b>	IMA371	<b>Semester</b>	Spring /Fall	<b>Credit</b>	3
<b>Target</b>	Industrial Management 3 <sup>rd</sup> grade						

<b>Professor</b>	Dooyeol, Choi	<b>E-mail</b>	dychoi@kut.ac.kr
<b>Prerequisite</b>			
<b>Abstract</b>	<p>Today's business environment is becoming more and more integrated internationally. To cope with this internationally integrated business, this course is designed to improve understanding on exchange rates, international financial markets, and international financial management for global business activities. For this end, we will learn theories and applications on exchange rate determination, exchange rate movement, corporate risk associated with exchange rate volatility, financing in international financial market (stock, international bond issuing), and financial management by derivatives (future, option swap). Through this course, we are trying to educate future CEOs who can run the business under the international environment, equipped with theories and knowledge on international finance. Today's business environment is becoming more and more opened and integrated internationally. This course is designed to improve the understanding on exchange rate, international financial market, and international financial management for global business activities. For this end, we will learn theories and applications on exchange rate determination, exchange rate movement, corporate risk associated with exchange rate volatility, financing in international financial market (stock, international bond issuing), and financial management by derivatives (future, option swap). Through this course, we are trying to cultivate the future CEOs of businesses who can run the business under the international environment</p>		

Evaluation Portion	Attendance	Homework	Mid-Term exam	Final-Term exam	Others		
		10	10	50	50		
	<b>Goal</b>			<b>Achievement method</b>		<b>Evaluation Method</b>	
<b>Teaching Materials</b>	Cheol S. Eun & Bruce G. Resnick, International Finance, McGraw Hill, 7th edition, Global Edition, ISBN-13:9780077161613						
<b>Reference</b>	강호상, 글로벌 재무관리, 4판, 법문사						
	김태준 송치영 유재원, 국제금융경제, 다산출판사						

## Learning Plan Learning Contents

Week	Learning Contents	Note
1	Introduction to International Finance	Chap 1
2	International Monetary System	Chap 2
3	Balance of Payments	Chap 3
4	Foreign Exchange Market	Chap 5
5	1st midterm	
6	International Parity Relationship	Chap 6
7	Exchange Rate Determination	Chap 6
8	Futures on FX	Chap 7
9	Options on FX	Chap 7
10	2nd midterm	
11	International banking and Money market	Chap 11
12	International Bond Market	Chap 12
13	Interest Swaps	Chap 14
14	Currency Swaps	Chap 14
15	Special Lecture	Free Topic
16	Final exam	

## Syllabus for Financial Management

<b>Course</b>	Financial Management	<b>Course Code</b>	IMA310	<b>Semester</b>	Spring	<b>Credit</b>	3
<b>Target</b>	Industrial Management 2 <sup>nd</sup> grade						

<b>Professor</b>	Dooyeol, Choi	<b>E-mail</b>	dychoi@kut.ac.kr
<b>Prerequisite</b>			
<b>Abstract</b>			

Evaluation Portion	Attendance	Homework	Mid-Term exam	Final-Term exam	Class Attitude		
	10	10	50	25	5		
	Goal			Achievement method		Evaluation Method	
<b>Details</b>	Fundamentals of Financial Statements			Lectures on Balance Sheet, Income Statement, Net working Capital, Operating Cash Flow		Check understanding on NPV, IRR, Capital Budgeting	
	Understanding of Time Value of Money			Lectures on future value, present value, discounting			
	Investment Decision			Lectures on the value of stocks and bonds		Check understanding on the pricing of stocks and bonds.	
	Introduction to risk and return			Definition of risk, Measurement of Risk, The trade off between Risk and Return.		Check understanding on standard deviation, variance of portfolio.	
	Diversification, Systematic and Unsystematic Risk			Portfolio, SML, required rate of return		Check understanding on the beta coefficient, Security Market Line	
<b>Teaching Materials</b>	Jordan Westerfield Ross, Corporate Finance Essentials, 8th edition(global edition), McGrawHill						
	연강흠 옮김, Ross Weterfield Jordan 저, 옛센셜 기업재무, 제9판, 지필미디어						
<b>Reference</b>	연강흠 옮김, Ross Weterfield Jordan 저, 옛센셜 기업재무, 제9판, 지필미디어						
	박정식 박종원 조재호, "현대재무관리", 다산출판사						
	이의경 이상우, "알기쉬운 재무관리", 명경사						
	Ross Westerfield Jordan, Essentials of Corporate Finance, 6th edition, McGrawHill						
	매일경제신문, 한국경제신문						

## Learning Plan Learning Contents

Week	Learning Contents	Note
1	Introduction to Corporate Finance	Chap 1
2	Fundamentals of Accounting	Lecture note (PPT)
3	Financial Statement	Chap 2
4	Working with financial statement	Chap 3
5	Time Value of Money	Chap 4
6	1st midterm	
7	Foundations for multiple cash flow valuation	Lecture note & Chap 5
8	Discounted cash flow valuation	Chap 5
9	Valutaion of Bonds	Chap 6
10	Valuation of stocks	Chap 7
11	2nd midterm	
12	Net present value and other investment criteria	Chap 8
13	Capital market history	Chap 10
14	Risk and return	Chap 11
15	Portfolio	Chap 11
16	Final Exam	



## Syllabus for Circuit Theory and Lab

<b>Course</b>	Circuit Theory and Lab	<b>Course Code</b>	MTF293	<b>Semester</b>	Spring	<b>Credit</b>	3
<b>Target</b>	Mechatronics Engineering 2 <sup>nd</sup> grade						

<b>Professor</b>	Giho, Gang	<b>E-mail</b>	khkang@koreatech.ac.kr
<b>Prerequisite</b>			
<b>Abstract</b>	<p>The course deals with circuit elements needed to construct electronic and electric circuits such as resistors, capacitors and inductors and we also tackle how to analyze and simultaneously interpret the characteristics of AC and DC circuits. Another purpose of this course is to equip students with capabilities designing and analyzing the circuits essential to construct control systems through many techniques with which students can analyze complex circuits easily.</p>		

Evaluation Portion	Attendance	Homework	Mid-Term exam	Final-Term exam	Others		
	10	30	30	30			
	<b>Goal</b>			<b>Achievement method</b>		<b>Evaluation Method</b>	
<b>Details</b>	Study of basic circuit concept			Lecture, and Homework Assignments		Test and Practice	
	Study of basic circuit elements' characteristics			Lecture, Homework Assignments and Practice		Test and Practice	
	Implementation of Basic circuits using Passive Elements			Homework Assignments and Practice		Test and Practice	
	Design of Applied Circuits using Circuit Elements			Homework Assignments and Practice		Test and Practice	
<b>Teaching Materials</b>	Engineering Circuit Analysis (10th ed.), J.D. Irwin & R.M. Nelms, Wiley, 2011						
	회로이론 (Robert Boylestad, 이일근 외 공역, 사이텍미디어/Pearson)						
<b>Reference</b>	전자회로의 기초(강준순 외 3, 북스힐, 2002)						
	최신 회로이론(정타관, 형설출판사, 2002)						
	전기회로의 이해(하순희, 홍릉과학, 2001)						
	회로이론 7판 (Thomas L. Floyd, 이응혁 외 7 공역, ITC/Prentice Hall)						

## Learning Plan Learning Contents

Week	Learning Contents	Note
1	Introduction	
2	Current and Voltage	
3	Ohm's Law	
4	Serial Circuits and KVL	
5	Parallel Cicuits and KCL	
6	Serial-Parallel Combination Circuits	
7	Thevenin's and Norton's Theorems	
8	Midterm Exam	
9	AC Voltage and AC current	
10	Capacitor	
11	Resistor-Capacitor Cicuits	
12	Inductor	
13	Resistor-Inductor Circuit	
14	Resistor-Inductor-Capacitor Circuit	
15	Polyphase Circuits	
16	Final Exam	

## Syllabus for Introduction to Display Engineering

<b>Course</b>	Introduction to Display Engineering	<b>Course Code</b>	MTF281	<b>Semester</b>	Fall	<b>Credit</b>	3
<b>Target</b>	Mechatronics Engineering 4 <sup>th</sup> grade						

<b>Professor</b>	Yunsik, Oh	<b>E-mail</b>	ysoh@koreatech.ac.kr
<b>Prerequisite</b>			
<b>Abstract</b>	Learn the basic principles of flat panel display-LCD,OLED,PDP,FED, Projection Display, Flexible Display, Touch Panel-and the manufacturing procedures of those displays.		

Evaluation Portion	Attendance	Homework	Mid-Term exam	Final-Term exam	Others		
	10	30	30	30			
	Goal			Achievement method		Evaluation Method	
<b>Details</b>	Learn about general knowledge of various displays.			Lecture and exam		Quiz every week	
	Understand the basic operating principles of each display system.			Lecture and exam		Quiz every week	
	Study the manufacturing procedure of each display.			Lecture and exam		Quiz every week	
	Learn about general market trend of display area.			Lecture and exam		Quiz every week	
<b>Teaching Materials</b>	디스플레이 기술의 기초, 니시쿠보 야스히코 저 박재우 역, 광문각, 2006 The basic principle of display technologies. Nishikubo Yashiko, 2006.						

## Learning Plan Learning Contents

Week	Learning Contents	Note
1	1장 Introduction of the course.	
2	2장 Field effect transistor.	
3	3장 Thin film transistor.	
4	4장 Liquid crystal display	
5	4장 Liquid crystal display	
6	4장 Liquid crystal display	
7	5장 Organic light emitting diode display.	
8	5장 Organic light emitting diode display.	
9	5장 Organic light emitting diode display.	
10	6장 Plasma discharge effect.	
11	7장 Plasma display panel display.	
12	8장 the principle of field effect	
13	9장 Field effect display.	
14	10장 Cathode ray tube display.	
15	11장 3d display	Advanced education improvement week
16	11장 3d display	

## Syllabus for Design of Mechanical Element

<b>Course</b>	Design of Mechanical Element	<b>Course Code</b>	MTF281	<b>Semester</b>	Fall	<b>Credit</b>	3
<b>Target</b>	Mechatronics Engineering 3 <sup>rd</sup> grade						
<b>Professor</b>	Byeongki, Kim		<b>E-mail</b>	byungki.kim@koreatech.ac.kr			
<b>Evaluation Portion</b>	<b>Attendance</b>	<b>Homework</b>	<b>Mid-Term exam</b>	<b>Final-Term exam</b>	<b>Others</b>		
	5	15	40	40			
<b>Teaching Materials</b>	기계설계, 김태우 등 공역, McGraw-Hill Korea						
<b>Reference</b>	Mechanical Engineering Design 9th edition by Budynas, McGraw-Hill						

### Learning Plan Learning Contents

Week	Learning Contents	Note
1	Introduction, computer lab	
2	Materials, computer lab	
3	Load and Stress Analysis, computer lab	
4	Deflection and Stiffness, computer lab	
5	Failure from Static Loading, computer lab	
6	Failure from Static Loading, computer lab	
7	Failure from Static Loading, computer lab	
8	Fatigue Failure, computer lab	
9	Midterm exam, computer lab	
10	Shafts, computer lab	
11	Screws, computer lab	
12	Welding, computer lab	
13	Springs, computer lab	
14	Bearings, Lab with nanofiber electrospinner producing machine elements	
15	Gears, Lab with nanofiber electrospinner producing machine elements	
16	Final exam	

## Syllabus for Applied Control Engineering

<b>Course</b>	Applied Control Engineering	<b>Course Code</b>	MEH341	<b>Semester</b>	Fall	<b>Credit</b>	3
<b>Target</b>	Mechanical Engineering 3 <sup>rd</sup> grade						

<b>Professor</b>	Dongho, Shin	<b>E-mail</b>	donghoup@koreatech.ac.kr				
<b>Prerequisite</b>							
<b>Abstract</b>	This lecture introduces modern control methodology based on state space equation with supplying the revisit of classical control method such as control design on frequency domain.						

Evaluation Portion	Attendance	Homework	Mid-Term exam	Final-Term exam	Others		
	5	25	35	35			
	Goal			Achievement method		Evaluation Method	
<b>Details</b>	Analysis of system on frequency domain, lead-lag compensator design			lecture and practice		Homework and exam.	
	System analysis and understanding of controller design in state space equation			lecture and practice		Homework and exam.	
	Understanding the differences between digital control and continuous control and understanding how to apply the continuous controller to digital systems			lecture and practice		Homework and exam.	
<b>Teaching Materials</b>	동적시스템 자동제어(Feedback control of dynamic systems), Gene F. Franklin 외 2인, Pearson, seventh edition						
	현대제어공학(Modern control engineering), Ogata, PEARSON(교보문고), 제5판						

## Learning Plan Learning Contents

Week	Learning Contents	Note
1	Frequency domain analysis(I)	Guide to Lab. Safety
2	Frequency domain analysis(II)	HW1
3	Lead-lag compensator design	
4	Analysis of control systems on state space(I)	HW2
5	Analysis of control systems on state space(II)	
6	Design of control systems on state space(I)	HW3
7	Design of control systems on state space(II)	
8	Observer design	Mid-term Exam.
9	Tracking Problem with Reference input and integration with observer	
10	Robust tracking controller and integral controller	HW4
11	Understanding of discrete systems	
12	Digital controller design	HW5
13	Controller design(Case study)	
14	Controller design(Case study)	HW6
15	Final Exam or presentation of term project	Term Project
16		

## Syllabus for System Dynamics

<b>Course</b>	System Dynamics	<b>Course Code</b>	MEH300	<b>Semester</b>	Fall	<b>Credit</b>	3
<b>Target</b>	Mechanical Engineering 4 <sup>th</sup> grade						

<b>Professor</b>	Igor Gaponov	<b>E-mail</b>	igor@koreatech.ac.kr
------------------	--------------	---------------	----------------------

<b>Prerequisite</b>	
<b>Abstract</b>	The knowledge about how to model and control a particular dynamic system is required in a variety of engineering applications. In this course, you will learn how to create a mathematical model of a dynamic system, to analyze its response to control input, and to improve the system's performance. Many theoretical and practical in-class examples are provided to help the students, and the computer modeling using MATLAB is used to help better understand the nature of the system dynamics and

Evaluation Portion	Attendance	Homework	Mid-Term exam	Final-Term exam	Others		
	5	15	30	40			

	Goal	Achievement method	Evaluation Method
<b>Details</b>	Mathematical Modeling of Dynamic Systems	To refresh the knowledge of how to find solutions for differential equations	Participation in discussion
	Time-domain and Frequency Analysis of Dynamic Systems	To become familiar with transient responses, zeros and poles, and Bode plots.	Participation in discussion
	Design and Stability Analysis of Control Systems	To master the basics of control systems modeling and main techniques of stability analysis	Participation in discussion
	Computer Modeling of Dynamic Systems using MATLAB	To become familiar with MATLAB and graphical programming using Simulink	Programming skills

<b>Teaching Materials</b>	"System Dynamics (4th Ed.)", Ogata K., Prentice Hall, 2004
	"System Dynamics for Engineering Students", Nicolae Lobontiu. Elsevier, 2010



## Learning Plan Learning Contents

Week	Learning Contents	Note
1	Introduction. Examples of Mechanical Systems	
2	Mathematical Foundation	
3	The Laplace Transform	
4	Transfer Functions	HW1 - System Modeling
5	Mathematical Modeling of Dynamic Systems	
6	Analytical and Numerical Solutions of Equations	HW2 - Solving ODEs using MATLAB
7	Time-domain Analysis of Dynamic Systems	
8	Mid-Term	
9	Frequency Analysis	
10	Closed-loop Systems	
11	Stability of Dynamic Systems	
12	Control Design and Analysis I	
13	Control Design and Analysis I	HW3 - Control Systems
14	Discrete-Time Systems	
15	Final Exam	
16	null data	

## Syllabus for Electrical and Electronics Engineering and Practice

<b>Course</b>	Electrical and Electronics Engineering and Practice	<b>Course Code</b>	MEF780	<b>Semester</b>	Spring	<b>Credit</b>	3
<b>Target</b>	Mechanical Engineering 2 <sup>nd</sup> grade						

<b>Professor</b>	Igor Gaponov	<b>E-mail</b>	igor@koreatech.ac.kr
<b>Prerequisite</b>			
<b>Abstract</b>	<p>In this class, we will learn to use MATLAB for solving various problems in such fundamental areas of engineering as linear algebra, curve fitting, solving linear equations and ordinary differential equations, and others. For all of the topics learnt, there will be MATLAB examples given in the class helping you to master the MATLAB software. By the end of this class, you are expected to become confident MATLAB programmers with the knowledge of how to apply the numerical methods on practice, which might be extremely important for your future study and engineering careers. This course will emphasize the development of numerical algorithms to provide solutions to common problems formulated in science and engineering. The primary objective of the course is to develop the basic understanding of the construction of numerical algorithms, and perhaps more importantly, the applicability and limits of their appropriate use. The emphasis of the course will be the thorough study of numerical algorithms to understand (i) the guaranteed accuracy that various methods provide, (ii) the efficiency and scalability for large scale systems. and (iii) issues of stability. An important component of numerical analysis is computational implementation of algorithms which are developed in the course in order to observe first hand the issues of accuracy, computational work effort, and stability. This class will be taught in the 'Flipped Classroom' format. Every week, you will be asked to watch a 30-min video before meeting me in the classroom. Also, we are going to use MATLAB during EVERY class.</p>		

Evaluation Portion	Attendance	Homework	Mid-Term exam	Final-Term exam	Others		
	5	25	30	40			
	Goal			Achievement method		Evaluation Method	
Details	Master MATLAB programming			MATLAB tutorials, in-class assignments and online lectures		Classwork, homework	
	Learn how to solve systems of linear equations			In-class exercises and practice along with theoretical discussions		Discussion, assignments	
	Learn solving ordinary differential equations			Case studies in MATLAB with real data, online and offline lectures		Discussion, assignments	
	Practice numerical integration and differentiation			Case studies, in-class projects		Classwork, assignments	
<b>Teaching Materials</b>	"Principles and Applications of Electrical Engineering (5th Ed.)", Rizzoni. McGraw Hill, 2008.						

## Learning Plan Learning Contents

Week	Learning Contents	Note
1	Introduction. Basics of Electricity	
2	Electric Circuits	
3	Network Analysis 1	
4	Network Analysis 2	
5	Network Analysis 3	
6	Balanced Bridge Circuits	
7	Thevenin and Norton Circuits	
8	Mid-Term	
9	AC Network. Capacitors	
10	Inductors	
11	Phasors	
12	Impedance II	
13	Transient Response I	
14	Transient Response II	
15	Frequency Response	
16	Final Exam	

## Syllabus for Welding Engineering

<b>Course</b>	Welding Engineering	<b>Course Code</b>	MEF700	<b>Semester</b>	Spring	<b>Credit</b>	3
<b>Target</b>	Mechanical Engineering 4 <sup>th</sup> grade						

<b>Professor</b>	Jeonghan, Hwang	<b>E-mail</b>	kook@kut.ac.kr
------------------	-----------------	---------------	----------------

Evaluation Portion	Attendance	Homework	Mid-Term exam	Final-Term exam	Others		
	10	30	30	30			

	Goal	Achievement method	Evaluation Method
--	------	--------------------	-------------------

<b>Teaching Materials</b>	NEW용접공학,국정환,원창,2014						
	MODERN WELDING,H.B.CARY,PRENTICE-HALL,2008						

<b>Reference</b>	최신용접공학,국정환,원창,2012						
	정밀용접공학,박종후,일진사,2010						
	최신용접공학,엄기원,돈명사,2011						
	용접강도핸드북,최정영,도서출판골드,2004						
	용접공학핸드북,국정환,과학기술,2004						

### Learning Plan Learning Contents

Week	Learning Contents	Note
1	orientation-welding	
2	2.electronic energy welding	team report1
3	SMAW	"
4	-TIG/MIG,	team report2
5	-SAW/PLASMA/LASER W./	"
6	3.fusion welding	team report3
7	4.pressure welding	team report4
8	exam.	
9	5. mechanical energy welding	team report5
10	6.chemical energy welding	team report6
11	7.pressure welding 2	team report7
12	8,automatic control in welding	team report8
13	9.drawing in welding	team report9
14	project1 -welding design	teak project1
15	project2-welding inspection , exam.	

## Syllabus for Creative Engineering Design

<b>Course</b>	Creative Engineering Design	<b>Course Code</b>	MEF661	<b>Semester</b>	Spring	<b>Credit</b>	3
<b>Target</b>	Mechanical Engineering 1 <sup>st</sup> grade						

<b>Professor</b>	Daniel G. Trainer	<b>E-mail</b>	dtrainer@koreatech.ac.kr
<b>Prerequisite</b>			
<b>Abstract</b>	<p>The 21st century's information-based industrial society needs talented people with the ability to be creative and think flexibly. Ironically, it is not knowledge or information, but the direction of thinking that is most important to the solution of a complex problem encountered in actual research and development. This course will cover the basics of engineering design, with a focus on creative idea generation and problem solving. This course introduces the concept of engineering design with a focus on creative thinking. Course topics will include the basics of engineering design, methods for effective teamwork and team management, methods for effectively defining engineering problems, and tools for</p>		

Evaluation Portion	Attendance	Homework	Mid-Term exam	Final-Term exam	Others		
	10	30	30	30			
Details	Goal			Achievement method		Evaluation Method	
	Understand the engineering design process			Lecture and practice		Presentation and exam	
	Understand methods of creative design.			Lecture and practice		Presentation	
	Understand basic principles of engineering design.			Lecture and practice		Presentation and exam	
	Apply basic creative design principles and tools to a basic design.			Lecture and practice		Presentation	
<b>Teaching Materials</b>	창의적공학설계, 김은경, 한빛아카데미						

## Learning Plan Learning Contents

Week	Learning Contents	Note
1	Course introduction, form teams, ice-breaker	
2	1. Engineering and creativity	
3	2. Engineering design	
4	3.1 Brainstorming	
5	3.2~3 Teamwork, Mindmap	
6	4.1 Problem Recognition	
7	5.1 Real Problem Definition, 5.3 Contradiction Analysis	
8	Midterm Exam	
9	6. Idea Generation	
10	6. Idea Generation	
11	6. Idea Generation	
12	7. Idea Evaluation	
13	8. Appropriate Technology	
14	8. Team Projects	
15	8. Team Projects	
16	Final Exam	

## Syllabus for Mechanical Control

<b>Course</b>	Mechanical Control	<b>Course Code</b>	MEF452	<b>Semester</b>	Spring	<b>Credit</b>	3
<b>Target</b>	Mechanical Engineering 3 <sup>rd</sup> grade						

<b>Professor</b>	Igor Gaponov	<b>E-mail</b>	igor@koreatech.ac.kr
<b>Prerequisite</b>	Engineering Mathematics 1, Ordinary Differential Equation		
<b>Abstract</b>	In this class, you will study what is control and control systems. We will learn the concept of transfer functions of mechanical, mechatronics, and electronic systems, and will learn to use transfer functions for control. You will also learn the concept of feedback and how to use it to improve your control system performance. We will use MATLAB software to model and simulate control systems and will study many practical examples. Lastly, we will practice in controller design and implementation using hardware		

Evaluation Portion	Attendance	Homework	Mid-Term exam	Final-Term exam	Others		
	5	20	35	40			

Details	Goal	Achievement method	Evaluation Method
		Learn system transfer functions	Lecture
	Study basic types of controllers	Lecture	Homework, Exam
	Controller design and implementation	Lecture	Homework, Exam
	Design a practical control system	Project	Homework, Exam

<b>Teaching Materials</b>	현대제어공학 (5 ed.), Ogata, 사이텍미디어, 2010
---------------------------	-------------------------------------

<b>Reference</b>	자동제어 (Kuo 저, 양해원 외 공역, 학술정보, 2006)
	Matlab을 활용한 시스템 제어, 이재춘, 북스힐, 2000
	Control System Engineering, Nise, John Wiley & Sons, 2000
	System Dynamics, Ogata, Pearson Education International, 2004
	Feedback Control of Dynamic Systems, G. Franklin et al, Addison-Wesley, 2003

## Learning Plan Learning Contents

Week	Learning Contents	Note
1	Introduction	
2	Basics of Control Systems	
3	Laplace Transform	
4	Mathematical Modeling	
5	Transfer Functions	
6	Modeling of Control Systems	
7	Time Domain Analysis 1	
8	Time Domain Analysis 2. Transient Response	
9	Mid-Term Exam	
10	Stability of Control Systems	
11	Root Locus Analysis	
12	Frequency Analysis	
13	Control System Design	
14	PD and PID controllers	
15	Root Locus Design	
16	Final Exam	



## Syllabus for Heat Transfer

<b>Course</b>	Heat Transfer	<b>Course Code</b>	MEC431	<b>Semester</b>	Spring	<b>Credit</b>	3
<b>Target</b>	Mechanical Engineering 3 <sup>rd</sup> grade						

<b>Professor</b>	Daniel G. Trainer	<b>E-mail</b>	dtrainer@koreatech.ac.kr
<b>Prerequisite</b>			
<b>Abstract</b>	<p>The basic principles of heat transfer will be understood and the three modes of heat transfer (conduction, convection, and radiation) will be studied. Students will understand how to apply heat transfer principles in practice through the use of engineering examples and simple design problems. Physics and physical arguments will be emphasized in order to develop an intuitive understanding of</p>		

Evaluation Portion	Attendance	Homework	Mid-Term exam	Final-Term exam	Others		
	10	20	30	40			
	Goal			Achievement method		Evaluation Method	
<b>Details</b>	Application of fundamental heat transfer principles to the design of thermal systems.			Concept explanation, real-world examples, in-class analysis examples.		Quiz, midterm and final exam.	
	Understand the theoretical equations governing heat transfer phenomena.						
	Understand the physical mechanisms that cause and govern heat transfer.						
<b>Teaching Materials</b>	Heat and Mass Transfer, 4th Ed. (SI Units), Y.A. Cengel, 2011						
	열전달, Y.A. Cengel, McGraw-Hill Korea, 2003						
<b>Reference</b>	열전달, Y.A. Cengel, McGraw-Hill Korea, 2003						
	열전달, F.P. Incropera, 사이텍미디어, 2003						

## Learning Plan Learning Contents

Week	Learning Contents	Note
1	Introduction and concepts	
2	Heat conduction equation	
3	Heat conduction equation / Steady Heat Conduction	
4	Steady Heat Conduction	
5	Transient Heat Conduction	
6	Transient Heat Conduction	
7	Convection Fundamentals	
8	Review and Midterm Exam	
9	Convection Fundamentals	
10	External Forced Convection	
11	External Forced Convection	
12	Internal Forced Convection	
13	Natural Convection	
14	Heat Exchangers	
15	Radiation	
16	Review and Final Exam	

## Syllabus for Numerical Methods and Practice

<b>Course</b>	Numerical Methods and Practice	<b>Course Code</b>	MEB600	<b>Semester</b>	Spring	<b>Credit</b>	3
<b>Target</b>	Mechanical Engineering 3 <sup>rd</sup> grade						

<b>Professor</b>	Igor Gaponov	<b>E-mail</b>	igor@koreatech.ac.kr
<b>Prerequisite</b>			
<b>Abstract</b>	<p>In this class, we will learn to use MATLAB for solving various problems in such fundamental areas of engineering as linear algebra, curve fitting, solving linear equations and ordinary differential equations, and others. For all of the topics learnt, there will be MATLAB examples given in the class helping you to master the MATLAB software. By the end of this class, you are expected to become confident MATLAB programmers with the knowledge of how to apply the numerical methods on practice, which might be extremely important for your future study and engineering careers. This course will emphasize the development of numerical algorithms to provide solutions to common problems formulated in science and engineering. The primary objective of the course is to develop the basic understanding of the construction of numerical algorithms, and perhaps more importantly, the applicability and limits of their appropriate use. The emphasis of the course will be the thorough study of numerical algorithms to understand (i) the guaranteed accuracy that various methods provide, (ii) the efficiency and scalability for large scale systems. and (iii) issues of stability. An important component of numerical analysis is computational implementation of algorithms which are developed in the course in order to observe first hand the issues of accuracy, computational work effort, and stability. This class will be taught in the 'Flipped Classroom' format. Every week, you will be asked to watch a 30-min video before meeting me in the classroom. Also, we are going to use MATLAB during EVERY class.</p>		

Evaluation Portion	Attendance	Homework	Mid-Term exam	Final-Term exam	Quiz	Project	
	5				75	20	
	Goal			Achievement method		Evaluation Method	
Details	Master MATLAB programming			MATLAB tutorials, in-class assignments and online lectures		Classwork, homework	
	Learn how to solve systems of linear equations			In-class exercises and practice along with theoretical discussions		Discussion, assignments	
	Learn solving ordinary differential equations			Case studies in MATLAB with real data, online and offline lectures		Discussion, assignments	
	Practice numerical integration and differentiation			Case studies, in-class projects		Classwork, assignments	
Teaching Materials	Applied Numerical methods with MATLAB (3rd Ed.), Steven C. Chapra, McGraw Hill, 2012						
	Chapra의 응용수치해석 (3판), 2012						

## Learning Plan Learning Contents

Week	Learning Contents	Note
1	Class Introduction and MATLAB Overview	
2	Matrix operations	
3	Root search: Bracketing and Open Methods.	
4	Root search : Case Study	Quiz 1
5	Optimization	
6	Linear Equations	Quiz 2
7	Curve Fitting	
8	Curve Fitting: Case Study 2	
9	Curve Fitting: Case Study 3	Quiz 3
10	Numerical Integration	
11	Numerical Integration of Functions	
12	Numerical Differentiation	Quiz 4
13	Ordinary Differential Equations 1	
14	Ordinary Differential Equations 2	
15	Ordinary Differential Equations 3	Quiz 5

## Syllabus for Thermodynamics

<b>Course</b>	Thermodynamics	<b>Course Code</b>	MEB331	<b>Semester</b>	Spring	<b>Credit</b>	3
<b>Target</b>	Mechanical Engineering 2 <sup>nd</sup> grade						

<b>Professor</b>	Daniel G. Trainer	<b>E-mail</b>	dtrainer@koreatech.ac.kr
<b>Prerequisite</b>			
<b>Abstract</b>	Thermodynamics deals with energy has long been an essential part of engineering curricula all over the world. It has a broad application area ranging from microscopic organisms to common household appliances, transportation vehicles, power generation systems, and even philosophy. This course covers the topics of energy, thermodynamic states and processes, entropy, and ideal heat engine and		

Evaluation Portion	Attendance	Homework	Mid-Term exam	Final-Term exam	Others		
	10	10	40	40			
	Goal			Achievement method		Evaluation Method	
Details	Understand the concepts of temperature, pressure, density, weight, mass, etc.			Concept explanation, real world examples, and in-class analysis examples.			
	Define efficiency and perform cycle analysis.						
	Understand work and heat transfer using the concepts of energy conservation and entropy. Understand turbine, compressor, nozzle, electric power generation, and refrigeration systems.						
Teaching Materials	Thermodynamics: An Engineering Approach 8th Edition, Yunus Cengel, Michael Boles						
	열역학(Cengel & Boles), 부준홍외 7인 공역, 맥그로힐-코리아, 8판, 2016						
Reference	Fundamentals - An Engineering of Approach, Yunus A.Cengel, Michael A. Boles, 8th ed., McGraw Hill, 2014.(주교재의 원서)						
	공업열역학, R. E. Sonntag, C. Borgnakke, 인터비전, 2007						
	열역학의 이해, 윤도영, 김병식, 김민찬 공역(Octave Levenspiel 원저), 사이텍 미디어 출판						

## Learning Plan Learning Contents

Week	Learning Contents	Note
1	Introduction	1-16, 58, 63
2	Energy, Energy Transfer and Analysis	2-43, 44, 54, 60, 67
3	Properties of Pure Substances	3-27, 34, 40, 41, 47, 48, 53, 70, 78
4	Properties of Pure Substances	
5	Energy Analysis of Closed Systems	4-5, 32, 37, 64, 67
6	Mass and Energy Analysis of Control Volumes	5-43, 47, 59, 81, 113
7	2nd Law of Thermodynamics	6-22, 41, 52, 77, 92, 97, 119
8	Review and Midterm Exam	
9	2nd Law of Thermodynamics	
10	Entropy	7-19, 22, 29, 38, 47, 74, 109, 118, 131
11	Entropy	
12	Gas Power Cycles	9-36, 49, 88, 115
13	Vapor and Combined Power Cycles	10-19, 88, 90
14	Refrigeration Cycles	11-20, 69, 72
15	Refrigeration Cycles	
16	Review and Final Exam	

## Syllabus for Dynamics

<b>Course</b>	Dynamics	<b>Course Code</b>	MEB321	<b>Semester</b>	Fall	<b>Credit</b>	3
<b>Target</b>	Mechanical Engineering 2 <sup>nd</sup> grade						

<b>Professor</b>	Daniel G. Trainer	<b>E-mail</b>	dtrainer@koreatech.ac.kr
<b>Prerequisite</b>			
<b>Abstract</b>	<p>Dynamics is that branch of mechanics which deals with the motion of bodies under the action of forces. The study of dynamics in engineering usually follows the study of statics, which deals with the effects of forces on bodies at rest. Dynamics has two distinct parts: kinematics, which is the study of motion without reference to the forces which cause motion, and kinetics, which relates the action of forces on bodies to their resulting motions. Dynamics is one of the most useful and powerful tools for analysis in engineering. The rapid technological developments of the present day require increasing application of the principles of mechanics, particularly dynamics. These principles are basic to the analysis and design of moving structures, to fixed structures subject to shock loads, to robotic devices, to automatic control systems, to rockets, missiles, and spacecraft, to ground and air transportation vehicles, to electron ballistics of electrical devices, and to machinery of all types such as turbines, pumps, reciprocating engines, hoists, machine tools, etc.</p>		

Evaluation Portion	Attendance	Homework	Mid-Term exam	Final-Term exam	Others		
		10	45	45			
	Goal			Achievement method		Evaluation Method	
Details	Develop understanding of Kinematics of Particles			Lecture & Practice		Power point presentation, Exercises	
	Develop understanding of Kinetics of Particles: Newton's Second Law			Lecture & Practice		Power point presentation, Exercises	
	Develop understanding of Kinetics of Particles: Energy and Momentum Methods			Lecture & Practice		Power point presentation, Exercises	
	Develop understanding of Systems of Particles			Lecture & Practice		Power point presentation, Exercises	
Teaching Materials	Vector Mechanics for Engineers: Dynamics (11 Edition in SI Units); Beer et al.: 2016						
	공학도를 위한 동역학 11판; Beer 등등; 2017						
Reference	공학도를 위한 동역학 [9판], F. Beer, R. Johnston, W Clausen, (유홍희, 강연준, 이재응)						

## Learning Plan Learning Contents

Week	Learning Contents	Note
1	Introduction	Notes
2	Rectilinear Motion of Particles (Chapter 11)	Notes, Exercises
3	Curvilinear Motion of Particles (Chapter 11)	Notes, Exercises
4	Kinetics of Particles: Newton's Second Law (Chapter 12)	Notes, Exercises
5	Kinetics of Particles: Newton's Second Law (Chapter 12)	Notes, Exercises
6	Kinetics of Particles : Energy and Momentum Methods (Chapter 13)	Notes, Exercises
7	Review	Exercises
8	Exam	
9	Systems of Particles (Chapter 14)	Notes, Exercises
10	Systems of Particles (Chapter 14)	Notes, Exercises
11	Systems of Particles (Chapter 14)	Notes, Exercises
12	Kinematics of Rigid Bodies (Chapter 15)	Notes, Exercises
13	Kinematics of Rigid Bodies (Chapter 15)	Notes, Exercises
14	Plane Motion of Rigid Bodies: Forces and Accelerations (Chapter 16)	Notes, Exercises
15	Review	Exercises
16	Exam	



## Syllabus for Statics

<b>Course</b>	Statics		<b>Course Code</b>	MEB301	<b>Semester</b>	Fall	<b>Credit</b>	2
<b>Target</b>	Mechanical Engineering 1 <sup>st</sup> grade							
<b>Professor</b>	Daniel G. Trainer		<b>E-mail</b>	dtrainer@koreatech.ac.kr				
<b>Prerequisite</b>								
<b>Abstract</b>	The course will cover basic engineering concepts and analysis techniques including force, moment, free-body-diagram, and equilibrium. Truss and machine analysis will be covered, as well as internal-force analysis. Finally, centroid, hydrostatic pressure, and moment of inertia will be discussed.							
<b>Evaluation Portion</b>	<b>Attendance</b>	<b>Homework</b>	<b>Mid-Term exam</b>	<b>Final-Term exam</b>	<b>Others</b>			
	10	20	35	35				
<b>Details</b>	<b>Goal</b>			<b>Achievement method</b>		<b>Evaluation Method</b>		
	Calculation using 2 and 3D vectors, including inner and outer vector product.			Lecture assignment	and individual	Assignment and exam		
	Fabrication of a free-body-diagram from a given problem.			Lecture assignment	and individual	Assignment and exam		
<b>Teaching Materials</b>	Engineering Mechanics: Statics (SI Units); Plesha, Gray and Costanzo; 2010							
	정역학(Plesja 외 2인 저, 여태인 외 6인 역, 지필미디어, 2012)							

## Learning Plan Learning Contents

Week	Learning Contents	Note
1	Introduction: Newton's laws of motions, force, units	
2	Vectors: Force and position	
3	Vectors: Force and position	
4	Particle equilibrium	
5	Particle equilibrium	
6	Moment of a force	
7	Equivalent force systems	
8	Rigid body equilibrium	
9	Rigid body equilibrium	
10	Structure analysis and machines	
11	Rigid body equilibrium	
12	Centroid and distributed loads	
13	Centroid and distributed loads	
14	Moments of inertia	
15	Moments of inertia	
16	Final Exam	

## Syllabus for Computer Programming Language

<b>Course</b>	Computer Programming Language	<b>Course Code</b>	BSM550	<b>Semester</b>	Fall	<b>Credit</b>	3
<b>Target</b>	Mechanical Engineering 2 <sup>nd</sup> grade						

<b>Professor</b>	Daniel G. Trainer	<b>E-mail</b>	dtrainer@koreatech.ac.kr
<b>Prerequisite</b>			
<b>Abstract</b>	<p>Programming skills are extremely important for a modern mechanical engineer. The most popular programming language in the world is C-language, and we will study it in this class (to be exact, we will study C++). We will study the syntax of C-language, how to write and debug your programs, how to use computer logic, and many other topics. Every week we will study a new topic and practice in programming on your PC. By the end of the class, we will cover some advanced topics such as array sorting, memory allocation, writing your own classes, and so on. The skills you obtain in this class can be extremely useful for your future study and in your work towards your graduation project.</p>		

Evaluation Portion	Attendance	Homework	Mid-Term exam	Final-Term exam	Others		
	5	15	35	45			
	Goal			Achievement method		Evaluation Method	
<b>Details</b>	Understanding Syntax and General Concepts of Programming in C-language			Learn basic commands, C++ syntax, and general program structure		Homework, exam	
	Learning Programming Environment			We will study how to use Microsoft Visual Studio: how to compile your programs, debug code and create executable files		Homework, exam	
	Practicing Console Output			Learn how to use console to print your program steps and make your program output the results		Homework, exam	
	Advanced Programming Topics			Study how to write functions, structures, classes, use pointers, etc.		Homework, exam	
<b>Teaching Materials</b>	C++로 시작하는 객체지향 프로그래밍 [3판], Liang Y. Daniel 지음; 김응성, 김정식 옮김; 2016						
	Introduction to Programming with C++ [3/E], Liang Y. Daniel; 2013						

## Learning Plan Learning Contents

Week	Learning Contents	Note
1	1.Introduction	
2	2.ElementaryProgramming	
3	3.Selections	
4	4.Math,Characters, and Strings	
5	5.Loops	
6	6.Functions	
7	6.Functions	
8	Midterm	
9	7.One-dimensional_Arrays	
10	8.Multidimensional_Arrays	
11	9.Objects_and_classes	
12	9.Objects_and_classes	
13	10.Object-Oriented_Thinking	
14	10.Object-Oriented_Thinking	
15	Term_Project	
16	Final Exam	

## Syllabus for Amorphous materials

<b>Course</b>	Amorphous materials	<b>Course Code</b>	MSA990	<b>Semester</b>	Spring	<b>Credit</b>	3
<b>Target</b>	Energy, Materials&Chemical Engineering 3 <sup>rd</sup> grade						
<b>Professor</b>	Arnaud Caron	<b>E-mail</b>					
<b>Prerequisite</b>							
<b>Abstract</b>	<p>While the physical and mechanical properties of crystalline materials can be rationalized on the basis of their long-range structural order, amorphous or glassy materials by definition lack such periodic structural order. As a consequence, the physical and mechanical properties of amorphous materials fundamentally differ from their crystalline counter-parts. In the first part of this course a brief review of amorphous materials and their technical applications will be given. In a later part the structure of amorphous materials will be discussed. The third part of this course will be dedicated to the glass transition and structural relaxation in amorphous materials. Later, preparation techniques for amorphous materials will be presented. In the fifth part the mechanical behavior of glassy materials and will be discussed. Finally, the physical properties of semi-conducting and metallic amorphous materials will be dealt with.</p>						
<b>Evaluation Portion</b>	<b>Attendance</b>	<b>Homework</b>	<b>Mid-Term exam</b>	<b>Final-Term exam</b>	<b>Others</b>		
	10	20	30	40			
<b>Teaching Materials</b>	Z.H. Stachurski, Fundamentals of amorphous solids, Wiley-VCH (2015)						

## Learning Plan Learning Contents

Week	Learning Contents	Note
1	Introduction	
2	Amorphous materials and their applications	
3	Amorphous materials and their applications	
4	Structure of amorphous materials	
5	Structure of amorphous materials	
6	Structure of amorphous materials	
7	Review of content before midterm exam	
8	Rheology of glasses	
9	Rheology of glasses	
10	Rheology of glasses	
11	Mechanical properties of glasses	
12	Mechanical properties of glasses	
13	Mechanical properties of glasses	
14	Review of content before final exam	
15	Final exam	
16	Introduction	

## Syllabus for Application of statistical met

<b>Course</b>	Application of statistical met	<b>Course Code</b>	MSA950	<b>Semester</b>	Spring	<b>Credit</b>	3
<b>Target</b>	Energy, Materials&Chemical Engineering 4 <sup>th</sup> grade						

<b>Professor</b>	Arnaud Caron	<b>E-mail</b>	
<b>Prerequisite</b>			
<b>Abstract</b>	<p>A key and common feature to all scientific disciplines is that they rely on data, their processing and analysis. In materials science experimentally or computationally acquired data are used to generate information on the structure of materials, their thermodynamic, mechanical and electrical properties. The generation of information often requires a preprocessing of the original data as a preliminary step, that may involve formatting, selection and filtering. In a second step, statistical methods can be used to extract information and its reliability. This practice oriented lecture is based on the application of the Matlab software package and on Edward L. Robinson's monography on "Data Analysis for Scientists and Engineers". This lecture is subdivided in two parts: theoretical and practical. In the theoretical part a review of • probability, • statistics (both frequentist and Bayesian) and • spectral analysis will be given. The practical part will deal with the analysis of experimental data such as • AFM signals and images, • nanoindentation data, • DSC traces, • X-ray diffractograms, and • XPS spectra. This will allow the students to practice data processing and filtering and to apply basic concepts introduced in the theoretical part to</p> <ul style="list-style-type: none"> <li>• Calculate probability distribution functions</li> <li>• Fit experimental data with theoretical functions</li> <li>• Numerically integrate and differentiate experimental data,</li> <li>• Deconvolute distributions, and</li> <li>• Calculate Power spectra.</li> </ul>		

Evaluation Portion	Attendance	Homework	Mid-Term exam	Final-Term exam	Others		
	10	20	30	40			
	Goal			Achievement method		Evaluation Method	
<b>Teaching Materials</b>	E.L. Robinson, Data Analysis for Scientists and Engineer, Princeton University Press (2016)						

## Learning Plan Learning Contents

Week	Learning Contents	Note
1	Introduction	
2	Probability	
3	Probability	
4	Probability distribution functions	
5	Probability distribution functions	
6	Frequentist Statistics	
7	Frequentist Statistics	
8	Midterm exam	
9	Least squares estimation	
10	Least squares estimation	
11	Spectral analysis	
12	Spectral analysis	
13	Deconvolution	
14	Deconvolution	
15	Final exam	
16	Introduction	



## Syllabus for Metal Materials

<b>Course</b>	Metal Materials	<b>Course Code</b>	MSA901	<b>Semester</b>	Fall	<b>Credit</b>	3
<b>Target</b>	Energy, Materials&Chemical Engineering 2 <sup>nd</sup> grade						

<b>Professor</b>	Jinhyun, Koh	<b>E-mail</b>	jhkoh@kut.ac.kr
<b>Prerequisite</b>			
<b>Abstract</b>	<p>Metallic materials are a part of engineering materials to make engineering products. In this course, a variety of engineering materials such as metallic, composite and some functional materials will be covered. In details, crystal structures, atomic arrangement, crystal imperfections such as dislocations, vacancy, interfacial defects which have influence on the strengthening of materials will be discussed. Heat treatment, surface hardening and plastic deformation process to enhance and to improve the materials mechanical properties will be treated. To understand the processes better, phase transformation and specific heat treatment methods will be studied. Practical applications of engineering materials such as mild steel, stainless steels, cast iron and steels, nonferrous metals such as aluminum alloys and copper alloys, metallic materials for special applications will be discussed.</p>		

Evaluation Portion	Attendance	Homework	Mid-Term exam	Final-Term exam	Others		
	20	20	30	30			
	Goal			Achievement method		Evaluation Method	
<b>Details</b>	To understand the basic theory on metals			Preview, lecture, homework		exam, report	
	To understand heat treatment of steels			Preview, lecture, homework		exam, report	
	To understand the mechanical behavior of metals under different conditions			Preview, lecture, homework		exam, report	
	Be able to classify the steels in terms of applications			Preview, lecture, homework		exam, report	
<b>Teaching Materials</b>	Metallic materials (in Korean), J.H.Koh, wonchang.2014						
	Engineering materials 1 An Introduction to Their Properties & Applications, Michael F Ashby. David R H Jones						
<b>Reference</b>	Light Alloys, Metallurgy of the Light Metals, I.J.Polmear 3rd. ed, Arnold						
	Engineering materials 1, An Introduction to Properties, Applications and Design, M.F.Ashby, Elsevier						

## Learning Plan Learning Contents

Week	Learning Contents	Note
1	Introduction to metals	
2	Crystal structure of metals	
3	Mechanical properties and plastic deformation of metals	
4	Phase diagram of metals	
5	Fe-Fe <sub>3</sub> C Phase diagram	
6	Heat treatment of steels-1	
7	Heat treatment of steels-II	
8	Mid-term exam	
9	Property changes under application conditions	
10	Structural steels-1	
11	Structural steels-II	
12	Special steels - STS, Heat resistant steels, superalloys	
13	Cast iron and steels	
14	Nonferrous metals	
15	Special metals-composite, function materials, refractory metal, display	
16	Final	

## Syllabus for Powder Materials Processing and Practice

<b>Course</b>	Powder Materials Processing and Practice	<b>Course Code</b>	MSA620	<b>Semester</b>	Fall	<b>Credit</b>	3
<b>Target</b>	Energy, Materials&Chemical Engineering 3 <sup>rd</sup> grade						

<b>Professor</b>	Haiwoong, Park	<b>E-mail</b>	hwpark@kut.ac.kr
<b>Prerequisite</b>			
<b>Abstract</b>	<p>In this course, importance and limitation of powder processing will be introduced compare with other fabrication techniques. Characterization and production process of powder, mixing and consolidation of powders, mechanisms and major factors affecting sintering, and various application of powder processing will be covered through lectures and lab experiments.</p>		

<b>Evaluation Portion</b>	<b>Attendance</b>	<b>Homework</b>	<b>Mid-Term exam</b>	<b>Final-Term exam</b>	<b>Others</b>		
	20	30	25	25			
<b>Details</b>	<b>Goal</b>			<b>Achievement method</b>		<b>Evaluation Method</b>	
	Understand various powder synthesis, compaction and sintering			lecture		exam	
	Ability of density calculation			lecture, discussion		report	
	Calculation ability for the sintering shrinkage			practice		report	
	Design ability of liquid processing to be able to enhance the sintering density			practice, report		exam, report	
<b>Teaching Materials</b>	Powder Metallurgy Iron and Steel Science (R.M. German, John Wiley & Sons, Inc. 1998 Metal Powder Industries Federation, 1997)						
<b>Reference</b>	Powder Metallurgy Science (R.M. German, Metal Powder Industries Federation, 1997)						
	Advanced Powder technology VI (Eds. Lucio Salgado et al., Materials Science Forum Vol. 591-593)						
	Fundamental of ceramic powder processing and synthesis (T.A. Ring, Academic Press, 1995)						
	Fundamental of Powder Metallurgy (L.F. Pease, III and W.G. West, Metal Powder Industry Federation, 2002)						

## Learning Plan Learning Contents

Week	Learning Contents	Note
1	Introduction of powder processing	
2	MgB <sub>2</sub> superconductor powder and synthesis processing	
3	Powder production and characterization	Proposal report for a project
4	Powder shaping and compaction, Fe powder compaction and heat treatment	
5	Fe powder compaction and heat treatment, MgB <sub>2</sub> superconductor heat treatment	
6	MgB <sub>2</sub> processing and applications, synthesis of superconductor powder,	
7	Powder sintering and characterization, Liquid sintering of Fe+Cu powder	Report for project results
8	Midterm exam.	
9	Powder sintering, liquid sintering of Fe+Cu powder	Proposal report for a project
10	Powder sintering, Characterization of Fe+Cu compacts	
11	Full density sintering	
12	Products and applications of powder metallurgy	
13	Porous powder sintering	Report for project results
14	Recent development of powder technologies and powder processings	
15		
16	Final exam.	

## Syllabus for Casting & Solidification Processing and Practice

<b>Course</b>	Casting & Solidification Processing and Practice	<b>Course Code</b>	MSA610	<b>Semester</b>	Spring	<b>Credit</b>	3
<b>Target</b>	Energy, Materials&Chemical Engineering 3 <sup>rd</sup> grade						

<b>Professor</b>	Arnaud Caron	<b>E-mail</b>	
<b>Prerequisite</b>			
<b>Abstract</b>	<p>Understanding solidification of metals and alloys is a key for microstructural design and the development of advanced metallic materials. In this course a brief review on the thermodynamics and phase diagrams of metals and alloys will be given. In a latter part a description of diffusion in metals and alloys will be presented. The third part of this course will deal with the solidification of metals and alloys so as to provide insights into the microstructural evolution during casting processes.</p>		

<b>Evaluation Portion</b>	<b>Attendance</b>	<b>Homework</b>	<b>Mid-Term exam</b>	<b>Final-Term exam</b>	<b>Others</b>		
	10	20	30	40			
<b>Teaching Materials</b>	D.M. Stefanescu, Science and Engineering of Casting Solidification, 3rd edition, Springer (2015)						

### Learning Plan Learning Contents

Week	Learning Contents	Note
1	Introduction	
2	Thermodynamic review	
3	Thermodynamic review	
4	Diffusion	
5	Diffusion	
6	Nucleation and Growth	
7	Nucleation and Growth	
8	MidTerm exam	
9	Solidification of single-phase alloys	
10	Solidification of multi component alloys	
11	Solidification of multi component alloys	
12	Mikroshrinkage	
13	Rapid solidification	
14	Summary	
15	Final exam	
16		

## Syllabus for Material Strength

<b>Course</b>	Material Strength	<b>Course Code</b>	MSA281	<b>Semester</b>	Fall	<b>Credit</b>	3
<b>Target</b>	Energy, Materials&Chemical Engineering 3 <sup>rd</sup> grade						

<b>Professor</b>	Arnaud Caron	<b>E-mail</b>	
<b>Prerequisite</b>			
<b>Abstract</b>	<p>The mechanical behavior of materials is closely related to its atomic structure and the occurrence of defects of different dimensionality. After a brief review on the structural properties of materials and on different deformation mechanisms (reversible, time dependent and permanent deformation) a thorough introduction in the methods to determine the mechanical properties of materials will be given. Following the foundations for linear elastic deformation will be presented and further extended to non-linear elasticity, viscoelasticity and anelasticity. In a latter part a detailed description of defects, of their mechanics and interactions will be presented, which will provide the basis for the understanding of plastic deformation of materials under different loading and environmental conditions. Thereby material design approach will be given to enhance the mechanical performance of materials.</p>		

<b>Evaluation Portion</b>	<b>Attendance</b>	<b>Homework</b>	<b>Mid-Term exam</b>	<b>Final-Term exam</b>	<b>Others</b>		
	10	20	30	40			

## Learning Plan Learning Contents

<b>Week</b>	<b>Learning Contents</b>	<b>Note</b>
1	Introduction	
2	Mechanical testing of materials	
3	Mechanical testing of materials	
4	Dislocations	
5	Dislocations	
6	Deformation of crystalline materials	
7	Deformation of crystalline materials	
8	Midterm exam	
9	Deformation of amorphous materials and polymers	
10	Strengthening mechanisms	
11	High-T deformation mechanisms	
12	High-T Deformation	
13	Fracture	
14	Fatigue	
15	Fatigue	
16	Final exam	

## Syllabus for Energy Materials Science

<b>Course</b>	Energy Materials Science	<b>Course Code</b>	ENE230	<b>Semester</b>	Fall	<b>Credit</b>	3
<b>Target</b>	Energy, Materials&Chemical Engineering 2 <sup>nd</sup> grade						

<b>Professor</b>	Seokjun, Kim	<b>E-mail</b>	skim@koreatech.ac.kr
<b>Prerequisite</b>			
<b>Abstract</b>	The relationship between the structure of materials and the resulting mechanical, thermal, electrical, and optical properties. Atomic structure, bonding, atomic arrangement; crystal structure, crystal symmetry, defects, and the use of X-ray diffraction. Phase equilibria and microstructural development. Applications to design.		

<b>Evaluation Portion</b>	<b>Attendance</b>	<b>Homework</b>	<b>Mid-Term exam</b>	<b>Final-Term exam</b>	<b>Others</b>		
	10	20	30	40			
	<b>Goal</b>			<b>Achievement method</b>		<b>Evaluation Method</b>	
<b>Details</b>	Introduction to Materials Science and Engineering: You will be introduced to the Structure, Processing and Properties of engineering materials (metals, polymers, and ceramics).			Lecture, Presentation		Exam, Presentation	
	Structure of Engineering Materials: You will learn the different levels of structure (atomic, crystal, microscopic) in engineering materials and how deviations from "perfect" structure (structural defects) play a vital role in determining material properties.			Lecture, Presentation		Exam, Presentation	
	Structure-Property Relationships: You will learn the basic Physical, Mechanical, Thermal, and Electrical properties of engineering materials and their dependence on material structure.			Lecture, Presentation		Exam, Presentation	
<b>Teaching Materials</b>	Fundamentals of materials science and engineering, Callister & Rethwisch, 4th edition, Wiley						

## Learning Plan Learning Contents

Week	Learning Contents	Note
1	Introduction: Atomic Bonding	
2	Crystal Structures: Planes and Directions	
3	Planes and Directions (cont.) Polycrystals, XRD	
4	Polymer structures	
5	Defects in Crystals	
6	Diffusion,	
7	Mechanical Properties	
8	Midterm exam	
9	Deformation and Strengthening	
10	Fracture	
11	Phase Equilibria	
12	Metals Processing and Microstructures	
13	Materials Processing	
14	Composites	
15	Electrical and Thermal Properties	
16	Final exam	



## Syllabus for Energy Physical Chemistry 2

<b>Course</b>	Energy Physical Chemistry 2	<b>Course Code</b>	ENE202	<b>Semester</b>	Fall	<b>Credit</b>	3
<b>Target</b>	Energy, Materials&Chemical Engineering 2 <sup>nd</sup> grade						
<b>Professor</b>	Soonmok, Choi		<b>E-mail</b>	smchoi@koreatech.ac.kr			
<b>Prerequisite</b>							
<b>Abstract</b>	Physical Chemistry provides the principles about the interaction of atoms and molecules with statistical behavior. This calss presents quantum mechanical investigations into chemical systems, concentrating on the fundamental nature of atoms, molecules and bonding.						

### Learning Plan Learning Contents

Week	Learning Contents	Note
1	Chapter 1 Introduction	
2	Chapter 2 Differential Equation- Newton	
3	Chapter 3 Group of particles - Boltzmann (1)	
4	Chapter 3 Group of particles - Boltzmann (2)	
5	Chapter 4 Failure of Classic (1)-Planck	
6	Chapter 4 Failure of Classic (2)-Einstein	
7	Chapter 4 Failure of Classic (3)- Fermi	
8	Mid-term examination	
9	Chapter 5 Meaning from Failure of Classic(1) - Schrödinger	
10	Chapter 5 Meaning from Failure of Classic(2) - Einstein	
11	Chapter 5 Meaning from Failure of Classic(3) - Heisenberg	
12	Chapter 5 Meaning from Failure of Classic(4) - Pauli	
13	Electronic conductivity in solids (1)	
14	Final examination	
15	supplementary lessons	
16	Chapter 1 Introduction	

## Syllabus for Chemistry Process Design and Practice

<b>Course</b>	Chemistry Process Design and Practice	<b>Course Code</b>	CHA411	<b>Semester</b>	Spring	<b>Credit</b>	3
<b>Target</b>	Energy, Materials&Chemical Engineering 4 <sup>th</sup> grade						

<b>Professor</b>	Yeongmi, Jeong	<b>E-mail</b>	quebecoise@koreatech.ac.kr
<b>Prerequisite</b>			
<b>Abstract</b>	<p>Process design requires the knowledge of basic chemical engineering principles including thermodynamics, reaction kinetics, material balance, heat &amp; mass transfer etc. This course would equip students with multidimensional approach to the real chemical engineering problems and also practical trouble shooting skills. The students will learn from basic engineering concepts to the preliminary detailed engineering principles. The main goal of the course will focus on the implementation and application of chemical engineering principles to the real world.</p>		

### Learning Plan Learning Contents

Week	Learning Contents	Note
1	overview of basic chemical engineering principles	
2	phase equilibria	
3	phase equilibria 2	
4	physical property estimation	
5	reactor volume design	
6	heat transfer design	
7	reactor configuration	
8	reactor types and features: distillation, fluidization and other special types	
9	mixing, agitation	
10	optimization	
11	scale-up factor	
12	PDF, pilot design	
13	Introduction to P&ID	
14	Process economics and capital cost estimation	
15	overview of basic chemical engineering principles	
16	phase equilibria	

## Syllabus for Life Organic Chemistry

<b>Course</b>	Life Organic Chemistry	<b>Course Code</b>	CHA231	<b>Semester</b>	Spring	<b>Credit</b>	3
<b>Target</b>	Energy, Materials&Chemical Engineering 3 <sup>rd</sup> grade						
<b>Professor</b>	Yongcheol, Lee		<b>E-mail</b>	ylee@kitech.re.kr			
<b>Prerequisite</b>							
<b>Evaluation Portion</b>	<b>Attendance</b>	<b>Homework</b>	<b>Mid-Term exam</b>	<b>Final-Term exam</b>	<b>Others</b>		
	5	20	25	50			
	<b>Goal</b>			<b>Achievement method</b>		<b>Evaluation Method</b>	
<b>Teaching Materials</b>	John E. McMurry Organic Chemistry						

### Learning Plan Learning Contents

Week	Learning Contents	Note
1	Introduction	
2	Chapter 21. Carboxylic Acid Derivatives	
3	Chapter 22. Carbonyl Alpha-Substitution	
4	Chapter 23. Carbonyl Condensation	
5	Chapter 23. Carbonyl Condensation	
6	Chapter 24. Amines and Heterocycles	
7	Chapter 24. Amines and Heterocycles	
8	Midterm Exam	
9	Chapter 25. Bio-molecules, Carbohydrates	
10	Chapter 25. Bio-molecules, Carbohydrates	
11	Chapter 26. Bio, Amino Acids, Peptides, Proteins	
12	Chapter 26. Bio, Amino Acids, Peptides, Proteins	
13	Chapter 27. Bio-molecules, Lipids	
14	Chapter 27. Bio-molecules, Lipids	
15	Chapter 28. Bio-molecules, Nucleic Acids	
16	Final Exam	

## Syllabus for Analytical Chemistry

<b>Course</b>	Analytical Chemistry	<b>Course Code</b>	CHA131	<b>Semester</b>	Spring	<b>Credit</b>	3
<b>Target</b>	Energy, Materials&Chemical Engineering 2 <sup>nd</sup> grade						

<b>Professor</b>	Namjoon, Cho	<b>E-mail</b>	njuncho@kut.ac.kr
<b>Prerequisite</b>			
<b>Abstract</b>	<p>Analytical Chemistry a key course to your future success in analytical data analysis and experimental design of any chemical related problems in every scientific disciplinary including chemistry, biology, biotechnology, materials science, medicine, environmental science, forensic science, food science, etc. This course is focused on the quantitative aspects of chemical analysis. It will be introduced that basic analytical concepts and theories and focus on data analysis and interpretation. It also includes gravimetric and volumetric methods of analysis, chemical equilibria, acid-base chemistry, complex formation reactions, potentiometric and electrochemical methods of analysis.</p>		

<b>Evaluation Portion</b>	<b>Attendance</b>	<b>Homework</b>	<b>Mid-Term exam</b>	<b>Final-Term exam</b>	<b>Others</b>		
	10	10	40	40			
<b>Details</b>	<b>Goal</b>			<b>Achievement method</b>		<b>Evaluation Method</b>	
	Understanding the Importance of Chemical Analysis			Lecture		Mid-term exam, Final-term exam, Presentation	
	Understanding of the fundamentals of chemical analysis			Homework & Presentation		Mid-term exam, Final-term exam, Presentation	
	Develop and utilize advanced technologies in chemical analysis			Homework & Presentation		Mid-term exam, Final-term exam, Presentation	
	Understanding of the overall method of chemical analysis			Homework & Presentation		Mid-term exam, Final-term exam, Presentation	
<b>Teaching Materials</b>	Exploring Chemical Analysis (4th Ed.), Daniel C. Harris, 자유아카데미						
	최신분석화학(4판), 김강진 외 3, 자유아카데미						
<b>Reference</b>	Fundamentals of Analytical Chemistry (8th Ed.), Skoog,						

## Learning Plan Learning Contents

Week	Learning Contents	Note
1	Analytical Process	
2	Chemical Measurement	Exercise
3	Tools of the Trade	Exercise
4	Math Toolkit	Exercise
5	Statistics	Exercise
6	Quality Assurance and Calibration Methods	Exercise
7	Good Titration	Exercise
8	First Exam	
9	Gravimetric and Combustion Analysis	Exercise
10	Introducing Acids and Bases	Exercise
11	Buffers	Exercise
12	Acid-Base Titrations	Exercise
13	Polyprotic Acids and Bases	Exercise
14	Deeper Look at Chemical Equilibrium	Exercise
15	EDTA Titrations	
16	Final Exam	

## Syllabus for General Chemistry

<b>Course</b>	General Chemistry	<b>Course Code</b>	BSM761	<b>Semester</b>	Spring / Fall	<b>Credit</b>	3
<b>Target</b>	Energy, Materials & Chemical Engineering 1 <sup>st</sup> grade						

<b>Professor</b>	Yeongmi, Jeong	<b>E-mail</b>	quebecoise@koreatech.ac.kr
<b>Prerequisite</b>			
<b>Abstract</b>	<p>The main goal of this course is “understanding chemical system”. The course deals with the basic principles of chemistry and equips students with ability to further their studies in advanced chemistry or experiments. The course starts with atoms, basic chemical elements and expands the scope to chemical structure and properties. Also, students learn chemical bonds formation through chemical reactions and energy changes associated with chemical reactions. Finally students learn chemical equilibrium, acid-base reaction, electrochemistry based on the knowledge above.</p>		

Evaluation Portion	Attendance	Homework	Mid-Term exam	Final-Term exam	Quiz 1	Quiz 2	Quiz 3
	10		30	35	8	8	9
<b>Details</b>	<b>Goal</b>			<b>Achievement method</b>		<b>Evaluation Method</b>	
	Able to understand the basic terminology of chemistry						
	Understand the basic chemistry principles and solve applied problems						
	Able to acquire the required data to solve basic chemical problems						
	Understand the interplay of each principles of chemistry and solve integrated problems						
<b>Teaching Materials</b>	Chemistry: McMurry Fay, published by Pearson (자유아카데미)						
	Introductory Chemistry: Steven S. Zumdahl						
<b>Reference</b>							

Week	Learning Contents	Note
1	Experimentation and Measurement	
2	Atoms, Molecules, and Ions	
3	Mass relationships in Chemical Reactions	
4	Reactions in Aqueous Solution	
5	Periodicity and the Electronic Structure of Atoms	
6	Ionic Compounds: Periodic Trends and Bonding Theory	
7	Covalent Bonding and Electron-Dot Structure	
8	Covalent Compounds: Bonding Theories and Molecular Structure	
9	Thermochemistry: Chemical Energy	
10	Gases: Their Properties and Behavior	
11	Liquids, Solids, and Phase Changes	
12	Solutions and Their Properties	
13	Chemical Kinetics (1)	
14	Chemical Kinetics (2)	
15	makeup classes	
16		

## Syllabus for Computer Network

<b>Course</b>	Computer Network	<b>Course Code</b>	IFC260	<b>Semester</b>	Spring	<b>Credit</b>	3
<b>Target</b>	Electronical•Electronics&Communication 3 <sup>rd</sup> grade						
<b>Professor</b>	Lenskiy Artem		<b>E-mail</b>	lensky@koreatech.ac.kr			
<b>Prerequisite</b>							
<b>Abstract</b>	The course covers network, transport and application layers of the TCP/IP network stack. Besides, multimedia content delivery and security protocols are discussed in details. A recently proposed blockchain protocol is discussed in the course as well.						
<b>Evaluation Portion</b>	<b>Attendance</b>	<b>Homework</b>	<b>Mid-Term exam</b>	<b>Final-Term exam</b>	<b>Others</b>		
		20	20	30	30		
	<b>Goal</b>			<b>Achievement method</b>		<b>Evaluation Method</b>	
<b>Details</b>	Concept of Upper Protocols and Services			Lecture		Exam	
	Application Layer Protocol Structure and Cases			Lecture		Exam	
	Service Analysis of Transport Layer			Lecture		Exam	
	Multimedia Networking Service Structure			Lecture		Exam	
<b>Teaching Materials</b>	James F. Kurose, Computer Networking: Top-Down Approach Featuring the Internet - Sixth edition, Addison Wesley, 2012						
<b>Reference</b>	Computer Networks 4/E, Tanenbaum, 2003						



## Learning Plan Learning Contents

Week	Learning Contents	Note
1	Introduction to computer networks and review of physical and data-link layers	
2	Network performance	
3	Building blocks of IP	
4	Building blocks of IP part 2	
5	IP routing	
6	Building blocks of Transport layer	
7	Principles of reliable data transfer	
8	Flow and congestion control	
9	Midterm exam	
10	Security computer networks part 1: Cryptography	
11	Security computer networks part 2: Secure communication	
12	Blockchain protocol	
13	Multimedia communication	
14	Application layer part 1	
15	Application layer part 2	
16	Final exam	

## Syllabus for DSP Processor and Lab

<b>Course</b>	DSP Processor and Lab	<b>Course Code</b>	IFB601	<b>Semester</b>	Spring	<b>Credit</b>	3
<b>Target</b>	Electrical•Electronics&Communication 4 <sup>th</sup> grade						

<b>Professor</b>	Jaeyeol, Im	<b>E-mail</b>	rheem@kut.ac.kr
<b>Prerequisite</b>	Digital Signal Processing and Lab		
<b>Abstract</b>	<p>DSP processor application areas are more and more enlarged with the current need of multimedia processing and networking in electronic devices. In DSP application, both of microprocessor based knowledge and digital signal processing knowledge are required, as well as high-level of programming ability. In this class, DSP structure and operation, peripheral devices and interfacing scheme, basic operation programming are studied, and real-time implementation of DSP algorithm is covered. "Microprocessor Theory and Lab." and "Digital Signal Processing and Lab." are prerequisites.</p>		

Evaluation Portion	Attendance	Homework	Mid-Term exam	Final-Term exam	Others		
	10	30	30	30			
<b>Details</b>	<b>Goal</b>			<b>Achievement method</b>		<b>Evaluation Method</b>	
	Understanding DSP processor and its developing tool usage			Lecture and Homework		Exam and Report	
	Implementing real-time signal processing on DSP board by using C language			Lecture and Homework		Exam and Report	
	Implementing real-life engineering project within a certain limitation			Term project		Term project report	
<b>Teaching Materials</b>	Prof. JaeYeol Rheem, "DSP Processor and Lab.", 2012						
	오영인, 김명진, "DSP 실시간 처리", 생능출판사						
<b>Reference</b>	A. V. Oppenheim and R. W. Schafer, "Discrete-Time Signal Processing", Prentice-Hall						
	미카미 나오키, "C언어에 의한 디지털 신호처리 입문", 성안당						
	정익주, "TMS320C5000 DSP를 이용한 실시간 디지털 신호처리", 생능출판사						

## Learning Plan Learning Contents

Week	Learning Contents	Note
1	Course overview and Introduction to TI DSP processor and developing tools, <Lab. Safty Edu.>	Ch. 1
2	TMS320C6000 DSP processor structure	Ch. 2
3	Introduction to DSP START kit and CodeBuilder, and experiment on I/O control (LED).	Ch. 2
4	Speech signal processing: Speech codec features, usage, and synchronization scheme by polling	Ch. 3
5	Real-time processing by interrupt and EDMA	Ch. 4
6	Experiment on data input and output by ADC and DAC	Ch. 5
7	Review	
8	Experiment on general signal processing 1: time-domain and frequency-domain analysis	Ch. 6
9	Experiment on general signal processing 2: FIR and IIR filtering and adaptive filtering	Ch. 6
10	Term Project 1-1	
11	Term Project 1-2	
12	Term Project 2-1	
13	Term Project 2-2	
14	Term Project 2-3	
15	Substituted Class	
16	Term Project Presentation	

## Syllabus for Advanced Electronic Circuit

<b>Course</b>	Advanced Electronic Circuit	<b>Course Code</b>	IFB270	<b>Semester</b>	Spring	<b>Credit</b>	3
<b>Target</b>	Electrical•Electronics&Communication 3 <sup>rd</sup> grade						

<b>Professor</b>	Manar Mohaisen	<b>E-mail</b>	manar.subhi@kut.ac.kr
<b>Abstract</b>	<p>The course starts with a review of the operation of the basic electronic devices, such as diode, BJT, and FET. Then, we will address the analysis and design of electronic circuits of FET amplifier and switching circuits, amplifier frequency response and the thyristors. Then, we will cover the operation of the operational amplifier (Op-Amp), its basic circuit, and several special-purpose Op-Amp circuits. Also, we will address oscillators using op-amps in the last chapter of the course.</p>		

<b>Evaluation Portion</b>	<b>Attendance</b>	<b>Homework</b>	<b>Mid-Term exam</b>	<b>Final-Term exam</b>	<b>4 Exams</b>		
	10				90		
	<b>Goal</b>			<b>Achievement method</b>		<b>Evaluation Method</b>	
<b>Teaching Materials</b>	Thomas L. Floyd, Electronic Devices. 8th edition, Prentice Hall, 2007.						
<b>Reference</b>	Adel Sedra and Kenneth Smith, Microelectronic Circuits. 6th edition, Oxford University Press, 2009						

## Learning Plan Learning Contents

Week	Learning Contents	Note
1	Course overview and introduction	
2	FET amplifiers and switching circuits (I)	
3	FET amplifiers and switching circuits (II)	
4	Amplifier frequency response (I)	Exam I
5	Amplifier frequency response (II)	
6	Thyristors (I)	
7	Thyristors (II)	
8	Midterm	Exam II
9	The operational amplifier (I)	
10	The operational amplifier (II)	
11	Basic op-Amp circuits (I)	
12	Basic op-Amp circuits (II)	Exam III
13	Special-purpose Op-Amp circuits (I)	
14	Special-purpose Op-Amp circuits (II)	
15	Oscillators	
16	Final exam	Exam IV

## Syllabus for Electric Signal Processing

<b>Course</b>	Electric Signal Processing	<b>Course Code</b>	IFA620	<b>Semester</b>	Fall	<b>Credit</b>	3
<b>Target</b>	Electronical•Electronics&Communication 4 <sup>th</sup> grade						

<b>Professor</b>	Ajay Gautam	<b>E-mail</b>	agautam@koreatech.ac.kr
<b>Abstract</b>	<p>Signal processing has important applications in many engineering and information-related areas including biomedical systems, geophysical systems, image/speech/video-related products, radar systems, robotics, power systems and many more. This course introduces the fundamentals of signal processing, particularly in the discrete domain. We will explore the concepts of analog-to-digital conversion and vice-versa, sampling and quantization, Fourier analysis, discrete Fourier transform (DFT) and fast Fourier transform (FFT), filter design and related topics.</p>		

Evaluation Portion	Attendance	Homework	Mid-Term exam	Final-Term exam	Others		
	15	20	30	35			
<b>Details</b>	<b>Goal</b>			<b>Achievement method</b>		<b>Evaluation Method</b>	
	To give a general overview signal processing and its applications			Lecture, tutorials, assignments		Class and home assignments, exams	
	To introduce the idea of sampling and reconstruction - A/D and D/A conversion			Lecture, tutorials, assignments		Class and home assignments, exams	
	To explore the representation and analysis of discrete-time signals and systems			Lecture, tutorials, assignments		Class and home assignments, exams	
	To learn about Fourier Fourier transforms and their applications in filtering			Lecture, tutorials, assignments		Class and home assignments, exams	
	To explore DFT, DFT and their applications			Lecture, tutorials, assignments		Class and home assignments, exams	
<b>Teaching Materials</b>	Proakis and Manolakis, Digital Signal Processing: Principles, Algorithms and Applications, 4th edition, Prentice Hall,						
	Ingle and Proakis, Digital Signal Processing Using MATLAB, 3rd edition, Cengage Learning, 2012						
<b>Reference</b>	Oppenheim, Alan, and Alan Willsky. Signals and Systems. 2nd edition, Prentice Hall, 1996						

## Learning Plan Learning Contents

Week	Learning Contents	Note
1	Course overview and introduction to signal processing	Lecture
2	Review of continuous time signals and systems	Lectures, discussions, practice
3	Sampling and quantization	Lectures, discussions, practice
4	Introduction to discrete-time signals and systems	Lectures, discussions, practice
5	The Z transform	Lectures, discussions, practice
6	Analysis of discrete-time signals and systems - I	Lectures, discussions, practice
7	Analysis of discrete-time signals and systems - II	Lectures, discussions, practice
8	Mid-term exam	Lectures, discussions, practice
9	Fourier series and Fourier transforms - I	
10	Fourier series and Fourier transforms - II	Lectures, discussions, practice
11	Applications of Fourier transforms - Filtering	Lectures, discussions, practice
12	Discrete Fourier transform and Fast Fourier transform - I	Lectures, discussions, practice
13	Discrete Fourier transform and Fast Fourier transform - II	Lectures, discussions, practice
14	Design of filters	Lectures, discussions, practice
15	Review and application examples	
16	Final exam	

## Syllabus for Special Issues on the Electrical Engineering

<b>Course</b>	Special Issues on the Electrical Engineering	<b>Course Code</b>	IFA611	<b>Semester</b>	Spring	<b>Credit</b>	3
<b>Target</b>	Electronical•Electronics&Communication 4 <sup>th</sup> grade						
<b>Professor</b>	Ajay Gautam		<b>E-mail</b>	agautam@koreatech.ac.kr			
<b>Prerequisite</b>							
<b>Abstract</b>	<p>This subject deals with various topics related with latest technology development in the electrical field. Students will prepare themselves to face with rapidly changing technologies in the real field. In particular, this course will deal with the basics of the interdisciplinary field of cyber-physical systems (CPSs) with its links to the other emerging areas such as Internet of Things (IoT) and Industry 4.0. Students will be introduced to the idea of the design and analysis of systems from the CPS perspective which emphasis on the integrated dynamics (involving continuous and discrete parts) of physical and</p>						
<b>Evaluation Portion</b>	<b>Attendance</b>	<b>Homework</b>	<b>Mid-Term exam</b>	<b>Final-Term exam</b>	<b>Others</b>		
	10	25	30	35			
	<b>Goal</b>			<b>Achievement method</b>	<b>Evaluation Method</b>		
<b>Details</b>	To give an overview of the basic features of a cyber-physical system (CPS), and to introduce the concept of the design of systems in the CPS perspective.			Lectures, discussions	Assignments, mid-term and final exams		
	To introduce the modeling of the dynamic behavior of various subsystems of a CPS including the physical and the cyber (computing and networking) components involved.			Lectures, discussions, assignments	Assignments, mid-term and final exams		
	To explore the design of a CPS including sensors and actuators, computing and memory elements and data input/output mechanisms, and to be familiar with analysis tools.			Lectures, discussions, assignments	Assignments, mid-term and final exams		
	To briefly introduce the basics of related emerging concepts such as Internet of Things and Industry 4.0.			Lectures, discussions, assignments, presentations	Assignments, mid-term and final exams, presentations		
	To encourage students to approach system design problems in a holistic and interdisciplinary way and to encourage the development of communication skills.			Lectures, discussions, assignments, presentations	Assignments, mid-term and final exams, presentations		
<b>Teaching Materials</b>	Lee & Seshia: Introduction to embedded systems: A cyber-physical systems approach, MIT Press, 2017						
<b>Reference</b>	Rajeev Alur: Principles of Cyber-Physical Systems, MIT Press, 2015						

## Learning Plan Learning Contents

Week	Learning Contents	Note
1	Overview of the course and introduction to CPSs	
2	CPS modeling - Continuous and discrete dynamics I	
3	CPS modeling - Continuous and discrete dynamics II	
4	CPS modeling - Continuous and discrete dynamics III	
5	CPS modeling - Hybrid systems	
6	CPS modeling - Concurrent systems	
7	CPS modeling - Models of computation	
8	Mid-term exam	
9	CPS design - I	
10	CPS design - II	
11	CPS analysis I	
12	CPS analysis II	
13	Introduction to Internet of Things (IoTs) and Industry 4.0	
14	Case studies and seminar	
15	Discussions	
16	Final exam	



## Syllabus for Electrical Machine Design

<b>Course</b>	Electrical Machine Design	<b>Course Code</b>	IFA380	<b>Semester</b>	Spring	<b>Credit</b>	3
<b>Target</b>	Electronical•Electronics&Communication 4 <sup>th</sup> grade						

<b>Professor</b>	Changsoon, Park	<b>E-mail</b>	cspark@kut.ac.kr
------------------	-----------------	---------------	------------------

<b>Prerequisite</b>							
---------------------	--	--	--	--	--	--	--

<b>Abstract</b>	<p>We design a In Industrial society most used ASM, with voltage, frequency, rpm, nominal Torque and max Torque. The design sequence- Determination of size, stator slot, winding design and rotor design. After designing we calculate characteristics using circle diagram and compare the Value between basic requirements and the design v</p>						
-----------------	--	--	--	--	--	--	--

Evaluation Portion	Attendance	Homework	Mid-Term exam	Final-Term exam	Others		
	20	60	10	10			
	Goal			Achievement method		Evaluation Method	
<b>Details</b>	determination of size			Understand of ASM construction understanding of esson's power factor			
	stator winding			Understand the winding methods		Drawing of winding plan	
	calculation of characteristics					Programming	
<b>Teaching Materials</b>	전기기기 설계(박창순, 흥릉과학출판사)						
<b>Reference</b>	전기기기 설계(정해상 역, 겸지사,1988)						
<b>Reference</b>							
<b>Reference</b>							

## Learning Plan Learning Contents

Week	Learning Contents	Note
1	Esson's Power Factor	
2	Calculation of stator size	
3	Power factor and efficiency	
4	Calculation of stator slot	
5	Winding of stator	
6	winding factor	
7	Calculation of stator teeth	
8	Examination	
9	determination of rotor size	
10	rotor slot and winding	
11	calculation of Inductance	
12	equivalent circuit	
13	calculation of characteristic using equivalent circuit	
14	circle diagram	
15	calculation of characteristic using circle diagram	
16		

## Syllabus for Applied Embedded System Lab

<b>Course</b>	Applied Embedded System Lab	<b>Course Code</b>	IFA193	<b>Semester</b>	Fall	<b>Credit</b>	3
<b>Target</b>	Electrical•Electronics&Communication 3 <sup>rd</sup> grade						

<b>Professor</b>	Jongdae, Jung	<b>E-mail</b>	jungjd@koreatech.ac.kr
------------------	---------------	---------------	------------------------

<b>Prerequisite</b>	Microprocessor and Lab
---------------------	------------------------

<b>Abstract</b>	<p>This course is intended for the students who have learned ATmega128 microprocessor. This course is composed of two parts. In the first part, students will learn more practical applications of microcontroller such as light intensity measurement, range finder by ultra sonic sound, Infra Red remotecontroller and RFID system. In the second part, the students will perform their own term project to design their own microcontroller application system. During Term project period, the students will present their progresses everyweek and they should finish their works by the end of the semester.</p>
-----------------	---

Evaluation Portion	Attendance	Homework	Mid-Term exam	Final-Term exam	Others		
		90		10			

	Goal	Achievement method	Evaluation Method
<b>Details</b>	Understanding of the light sensor	Lecture and Discussion	
	Understanding of the ultra sonic range finder	Lecture and Discussion	
	Understanding of the IR remote controller	Lecture and Discussion	
	Understanding of RFID system	Lecture and Discussion	
	Performing Term Project	Presentation and Discussion	Presentations and Result of Term Project

<b>Teaching Materials</b>	Lecture Material uploaded on the on-line education support system on the KOREATECH portal

<b>Reference</b>	Microcontroller Basics, the ATmega128, written by Jung, Jongdae, 2016. 3 공감북스
	Various related materials on the internet

## Learning Plan Learning Contents

Week	Learning Contents	Note
1	Measurement of light intensity using CDS kight sensor	
2	LED light intensity control using light sensor	
3	Understanding the principle of IR remote controller operation	
4	Implementation of IR remote controller receiver	
5	Implementation of range finder using ultra sonic sensor	
6	Implementation of range finder using ultra sonic sensor	
7	Understanding the principle of RFID system	
8	Implementation of RFID application system	
9	Term Project	
10	Term Project	
11	Term Project	
12	Term Project	
13	Term Project	
14	Term Project	
15	Term Project	
16	Final Test of the Term Project	

## Syllabus for Computer Programming Basic

<b>Course</b>	Computer Programming Basic	<b>Course Code</b>	BSM540	<b>Semester</b>	Spring	<b>Credit</b>	3
<b>Target</b>	Electrical•Electronics&Communication 1 <sup>st</sup> grade						

<b>Professor</b>	Ajay Gautam	<b>E-mail</b>	agautam@koreatech.ac.kr
------------------	-------------	---------------	-------------------------

<b>Prerequisite</b>	
---------------------	--

<b>Abstract</b>	<p>This course will introduce the students to the basics of programming using the C language. We will first give an overview of problem-solving using computer programming and then introduce the basic features of the C language including data types, variables and constants, simple built-in functions, formatted input/output, characters and strings, operators, expressions, and statements. We will also discuss control statements (looping, branching, and jumps), functions, arrays, and some other features for data handling and input-output.</p>
-----------------	--

Evaluation Portion	Attendance	Homework	Mid-Term exam	Final-Term exam	Others		
	20	20	30	30			

	Goal	Achievement method	Evaluation Method
<b>Details</b>	To give a general overview of computer programming and the C language	Lecture, assignments	Class and home assignments, mid-term and final exams
	To introduce the basic syntax of C: Data types, input-output, operators, expressions and statements, and control structures	Lecture, assignments	Class and home assignments, mid-term and final exams
	To introduce functions and the idea of modular programming	Lecture, assignments	Class and home assignments, mid-term and final exams
	To introduce arrays and some other features for handling and input-output of data	Lecture, assignments	Class and home assignments, mid-term and final exams
	To give a general overview of computer programming and the C language	Lecture, assignments	Class and home assignments, mid-term and final exams

<b>Teaching Materials</b>	Stephen Parta, C Primer Plus, fifth edition. USA: SAMS, 2005.

<b>Reference</b>	Paul Deitel and Harvey Deitel, C: How to Program, fifth/sixth edition. Prentice Hall, 2006/2009.
	Brian Kernighan and Dennis Ritchie, The C Programming Language, second edition. Prentice Hall, 1988.
	천인국, 누구나 쉽게 즐기는 C언어 콘서트, 생능출판사, 2011

## Learning Plan Learning Contents

Week	Learning Contents	Note
1	Course overview and introduction to the C language	
2	Data types, variables, constants, reserved words etc.	
3	Standard formatted input/output	
4	Operators, expressions and statements	
5	Control structures I	
6	Control structures II	
7	Application project I	
8	Midterm exam	
9	Functions I	
10	Functions II	
11	Arrays I	
12	Arrays II	
13	Structures and file input/output	
14	Application project II (I)	
15	Application project II (II)	
16	Final exam	

## Syllabus for Numerical Methods and Practice

<b>Course</b>	Numerical Methods and Practice	<b>Course Code</b>	BSM510	<b>Semester</b>	Spring / Fall	<b>Credit</b>	3
<b>Target</b>	Electronical•Electronics&Communication 2 <sup>nd</sup> grade						

<b>Professor</b>	Manar Mohaisen	<b>E-mail</b>	manar.subhi@kut.ac.kr
------------------	----------------	---------------	-----------------------

<b>Prerequisite</b>	
---------------------	--

<b>Abstract</b>	<p>This course aims to introduce the students to several numerical analysis tools that can be used to solve a wide range of engineering problems. To turn this course more practical, students will be introduced to MATLAB software which is rich of built-in libraries that ease the implementation and optimization of studied algorithms. The topics covered in this course include error analysis, linear fitting, splines interpolation, finding roots of equations, linear algebraic systems and methods to solve it including LU factorization among others, Fourier analysis will be covered as well, besides numerical integration and differentiation. Finally, topics related to ordinary differential equations will be addressed.</p>
-----------------	---

Evaluation Portion	Attendance	Homework	Mid-Term exam	Final-Term exam	4 exams	Quiz	
	8				60	32	

Goal	Achievement method	Evaluation Method
------	--------------------	-------------------

<b>Details</b>	MATLAB	Give easy examples and homework to emphasis on the theoretical issues explained in the class	Assessment will be based on the capability of the student to produce results with compliance with the material taught in the class
	linear fitting, splines interpolation, finding roots of equations	Give easy examples and homework to emphasis on the theoretical issues explained in the class	Assessment will be based on the capability of the student to produce results with compliance with the material taught in the class
	linear algebraic systems and methods to solve it	Give easy examples and homework to emphasis on the theoretical issues explained in the class	Assessment will be based on the capability of the student to produce results with compliance with the material taught in the class
	Eigenvalues and Fourier analysis	Give easy examples and homework to emphasis on the theoretical issues explained in the class	Assessment will be based on the capability of the student to produce results with compliance with the material taught in the class
	ordinary differential equations	Give easy examples and homework to emphasis on the theoretical issues explained in the class	Assessment will be based on the capability of the student to produce results with compliance with the material taught in the class

<b>Teaching Materials</b>	S. Chapre, "Applied Numerical Analysis with MATLAB for Engineers and Scientists," McGraw-Hill, 3rd Edition, 2012.
---------------------------	---

<b>Reference</b>	

## Learning Plan Learning Contents

Week	Learning Contents	Note
1	Mathematical modeling and Matlab fundamentals	
2	Programming with matlab	
3	Roundoff and truncation errors	
4	Roots: Bracketing methods and open methods	
5	Linear Algebraic equations and Gauss elimination, LU decomposition	
6	matrix inverse: iterative methods, EVD	
7	General linear LS and nonlinear regression	
8	Midterm	
9	Linear regression (Curve fitting)	
10	Fourier analysis and Polynomial interpolation	
11	Splines and piecewise interpolation	
12	Numerical integration formulas	
13	Numerical integration of functions	
14	Numerical differentiation	
15	Ordinary differential equations (initial-value and boundary-value problems)	
16	final exam	



## Syllabus for Engineering Statistics and Practice

<b>Course</b>	Engineering Statistics and Practice	<b>Course Code</b>	BSM461	<b>Semester</b>	Fall	<b>Credit</b>	3
<b>Target</b>	Electronical•Electronics&Communication 2 <sup>nd</sup> grade						

<b>Professor</b>	Lenskiy Artem	<b>E-mail</b>	lensky@koreatech.ac.kr
------------------	---------------	---------------	------------------------

<b>Prerequisite</b>	
---------------------	--

<b>Abstract</b>	<p>The course covers the probability theory and random processes. We begin by reviewing the set theory that is employed to define the term probability. Next an excursus in combinatorics is given. Based on the given definition of the probability we study conditional probability and the Bayes theorem. Discrete random variables, the mass probability function and the characteristic function are studied next. We further generalize the material to multiple discrete random variables and then to continuous random variables. Finally, we discuss random processes and the theory of wide sense stationary process. The course ends with the description of Gaussian and Poisson random processes. The course consists of 16 weeks of two 2 hours classes per week. The first two hours covers the theory and the other two hours are devoted to problem solving skills development.</p>
-----------------	--

Evaluation Portion	Attendance	Homework	Mid-Term exam	Final-Term exam	Others		

	Goal	Achievement method	Evaluation Method
<b>Details</b>	Learn basics of random variables and processes	Extensive number of examples is given during the course	Homework reports
	Learn how to program basic statistical problems	Students are asked to participated in class discussions	Quizes
	Learn applications of random processes	Basics of Matlab are introduced	Lab practice and midtrem project

<b>Teaching Materials</b>	Steven Kay, Intuitive Probability and Random Processes Using MATLAB, Springer 2012.
	Peyton Z. Peebles, Probability, Random Variables and Random Signal Principles, 462p. 4th Edition

<b>Reference</b>	A. Papoulis, S.U. Pillai, Probability, Random Variables and Stochastic Processes. 852p, 4th Edition.
	You can find additional info and lecture notes here <a href="http://synteam.org/probability-random-processes/">http://synteam.org/probability-random-processes/</a>
	John Rice , Mathematical statistics and data analysis, 3rd ed., Cengage Learning, 2006

## Learning Plan Learning Contents

Week	Learning Contents	Note
1	Introduction and computer simulations in probability theory	
2	Basics of probability theory	
3	Combinatorics	
4	Conditional probability	
5	Random Variables	
6	Expected values for discrete RV	
7	Multiple Discrete Random Variables	
8	Conditional Probability Mass Function	
9	Midterm	
10	Continuous Random Variables	
11	Expectations of Continuous Random Variables	
12	Probability and Moment Approximations using Limit Theorems	
13	Principles of Statistics	
14	Basic Random Processes	
15	Wide sense stationary random processes	
16	Final Exam	

## Syllabus for Database System

<b>Course</b>	Database System	<b>Course Code</b>	CPS510	<b>Semester</b>	Fall	<b>Credit</b>	3
<b>Target</b>	Computer Science Engineering 3 <sup>rd</sup> grade						

<b>Professor</b>	Muhammad	<b>E-mail</b>	tariq@kut.ac.kr
------------------	----------	---------------	-----------------

<b>Prerequisite</b>	
---------------------	--

<b>Abstract</b>	<p>This course is intended to give students a solid background in databases, with a focus on relational database management systems. Topics include data modeling, data definition and manipulation languages, storage and indexing techniques, query processing and optimization, concurrency control and recovery, and database programming interfaces.</p>
-----------------	---

Evaluation Portion	Attendance	Homework	Mid-Term exam	Final-Term exam	Others		
	10	20	30	30	10		

	Goal	Achievement method	Evaluation Method
<b>Details</b>	learn the fundamentals of database management systems	lectures, labs, discussions	exams, assignments
	Learn SQL Programming	lectures, labs, discussions	exams, assignments
	Understanding of query processing and optimization	lectures, labs, discussions	exams, assignments
	Develop a basic understanding of transaction processing	lectures, labs, discussions	exams, assignments

<b>Teaching Materials</b>	Fundamentals of database systems by Elmasri and Navathe.

## Learning Plan Learning Contents

Week	Learning Contents	Note
1	introduction	
2	Database Systems Concepts and Architecture	
3	The Relational Data Model and Relational Database Constraints	
4	Basic SQL	
5	More SQL: Complex Queries, Triggers, Views, and Schema Modification	
6	Introduction to SQL Programming Techniques	
7	Trigger and functions	
8	stored procedures	
9	Mid Exam	
10	Transaction Processing Concepts and Theory	
11	Concurrency Control Techniques	
12	Database Recovery Techniques	
13	Strategies for Query Processing	
14	Distributed Database Concepts	
15	NOSQL Databases and Big Data Storage Systems, Big Data Technologies	
16	Final Exam	

## Syllabus for Windows Programming

<b>Course</b>	Windows Programming	<b>Course Code</b>	CPC311	<b>Semester</b>	Fall	<b>Credit</b>	3
<b>Target</b>	Computer Science Engineering 2 <sup>nd</sup> grade						

<b>Professor</b>	Yungbok, Joo	<b>E-mail</b>	ybjoo@koreatech.ac.kr
------------------	--------------	---------------	-----------------------

<b>Prerequisite</b>	
---------------------	--

<b>Abstract</b>	<p>Students learn the basic theory which can handle the MS windows efficiently and they practice the skills to develop windows-based application with MS Visual C++.Also highly practical and fundamental image processing techniques will be presented and practiced as a major subject.</p>
-----------------	---

<b>Evaluation Portion</b>	<b>Attendance</b>	<b>Homework</b>	<b>Mid-Term exam</b>	<b>Final-Term exam</b>	<b>Others</b>		
	10	30	30	30			

## Syllabus for Basic Design of Computer Systems

<b>Course</b>	Basic Design of Computer Systems	<b>Course Code</b>	CPA260	<b>Semester</b>	Fall	<b>Credit</b>	3
<b>Target</b>	Computer Science Engineering 2 <sup>nd</sup> grade						
<b>Professor</b>	Yungbok, Joo		<b>E-mail</b>	ybjoo@koreatech.ac.kr			
<b>Prerequisite</b>							
<b>Abstract</b>	<p>This course introduces basic design tools, engineering design process and system engineering concepts for computer engineering field. This course also covers team work, project management and engineering ethics. This course mainly focuses on the development of creativity and convergence</p>						
<b>Evaluation Portion</b>	<b>Attendance</b>	<b>Homework</b>	<b>Mid-Term exam</b>	<b>Final-Term exam</b>	<b>Term-Project</b>		
	10	20		30	40		
<b>Reference</b>	Design for Electrical and Computer Engineers, McGraw-Hill						
	시스템 분석 설계, 생능출판사						

## Syllabus for Data Structure and Practice

<b>Course</b>	Data Structure and Practice	<b>Course Code</b>	CPA250	<b>Semester</b>	Fall	<b>Credit</b>	3
<b>Target</b>	Computer Science Engineering 2 <sup>nd</sup> grade						

<b>Professor</b>	Muhammad	<b>E-mail</b>	tariq@kut.ac.kr
<b>Prerequisite</b>	Programming Language C Programming II		

<b>Abstract</b>	<p>Data Structure and Practice course is an important subject as the topics covered in it will be encountered again and again in the future courses. Due to its great applicability, this is usually called as the foundation course in computer science. In this course, well-known data structures such as dynamic arrays, linked lists, stacks, queues, trees and graphs will be studied. In order to understand the concepts and principles deeply, these data structures will be implemented in object oriented environment such as C++ or Java. In addition, students will learn the use of data structures in solving various computational problems.</p>
-----------------	--

Evaluation Portion	Attendance	Homework	Mid-Term	Final-Term	Others		
	10	30	30	30			

	Goal	Achievement method	Evaluation Method
<b>Details</b>	Comprehend the importance of data structures in algorithms and problem solving	Lectures, discussions	Exames, Assignments
	Understand the well-known data structures	Lectures, discussions, labs	Exames, Assignments
	Implement the well-known data structures	Lectures, labs	Exames, Assignments
	Apply these data structures in solving various computational problems	Lectures, discussions, labs	Exames, Assignments

<b>Teaching Materials</b>	Data Structures using C++ by I. G. Chan and Y. K. Choi
---------------------------	--

<b>Reference</b>	ADTs, Data Structures. And Problem Solving with C++, 2nd Edition by Larray Nyhoff
	Data Structures and Algorithm Analysis in C++, 3rd Edition, Pearson Addison Wesley, by Mark Allen Weiss
	Data Structures and Algorithm Analysis (C++ Version) Dover Publications, Clifford A. Shaffer
	Handbook of Data Structures and Applications (Chapman & Hall/CRC by Dinesh P. Mehta and Sartaj Sahni

## Learning Plan Learning Contents

Week	Learning Contents	Note
1	Introduction	
2	C++ Review	
3	List-1	
4	List-2	
5	Stack-I	
6	Stack-II	
7	Queue-I	
8	Queue-II	
9	Mid-term	
10	Tree-1	
11	Tree-2 (BST)	
12	Tree-3 (AVL)	
13	Heap	
14	Table and Dictionaries	
15	Graphs	
16	Final Exam	