

Course Description

UEC Exchange program Japanese University Studies in Science and Technology (JUSST)

Fall Semester, 2020

Center for International Programs and Exchange
The University of Electro-Communications

We stay **U**nited against th**E** innovational **C**hallenge

UEC JUSST Program Course Description

Japanese University Studies in Science and Technology (JUSST)

Center for International Programs and Exchange (CIPE)

The University of Electro-Communications

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Tokyo, Japan

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JUSST Program Course Requirements

	Subject	1 st Semester	2 nd Semester
CORE SUBJECTS	LAB WORK Research / Project (Required for JUSST student)	[UNDERGRADUATE STUDENTS] <u>Individual Study Project</u> under the supervision of UEC faculty member. Minimum 8 hours/week 5 Credits/one academic year (2 Credits/one semester)	
		[GRADUATE STUDENTS] <u>Independent Research Project</u> under the supervision of UEC Faculty member. Minimum 8 hours/week 6 Credits/one academic year (3 Credits/one semester)	
	Academic Skills I	2 hours/week (2 Credits)	—
	Academic Skills II		
	Academic Skills III	—	2 hours/week (2 Credits)
	Japanese Language	Elementary / Intermediate / Advanced * 8 - 14 hours/week (6 - 7 Credits)	
	Science and Engineering Subjects (ELECTIVE)	[UNDERGRADUATE STUDENTS] Need to pass <u>3 subjects</u> at minimum ** in <i>Each Semester</i>	
		[GRADUATE STUDENTS] Need to pass <u>3 subjects</u> at minimum ** in <i>One Academic Year</i>	
		Electronic Experiment Lab. 4 hours/week (2 Credits) Required for all Undergraduate Students Only offered in the FALL Semester	
	FREE ELECTIVE	Research Presentation	2 hours/week (2 Credits)
Reading Scientific Research		Offered in the SPRING Semester only	
English for Interpersonal Communication		2 hours/week (2 Credits)	
Preparation for Graduate School		Offered in the FALL Semester only	
Sports Classes		—	2 hours/week (1 Credit)

*) Japanese language classes may be exempted in the 2nd semester.

**) Students are highly recommended to take scientific & Engineering courses, at least one subject more than the minimum requirement in order to ensure your successful completion of JUSST program. (Form D)

***) “Electronic Experiment Lab” is considered as one of the Science and Engineering Subjects.

2020 FALL SEMESTER CALENDAR

[illegible]

National holiday
University center exam and UEC entrance exams

@JUSST students Weekly Meeting
Every _____ (start from _____ in E2-B117)

Time-Table for Fall Semester, 2020

令和2年度秋学期（後期） 短期留学プログラム時間割

Day 曜日	Period 授業時間	Subject 授業名	Department 学科等	Lecturer 教員名	Classroom 教室	Note 備考
Mon 月	1					
	2	Topics in Informatics I (Evolutionary Computation)	J	SATO Hiroyuki (佐藤 寛之)		
	3					
	4					
	5					
Tue 火	1	UEC Academic Skills I (Computer Literacy)	CIPE	CHOO		For 2nd semester students only
	2	UEC Academic Skills II (Information literacy and Research)	CIPE	CHOO		
		Life Long Learning Sports	SPORTS	ANDO Soichi (安藤 創一)	Face to Face only	
	3	Japanese Language (日本語)	CIPE			
	4	Japanese Language (日本語)	CIPE			
	5	Preparation for Graduate School	HLSS	UEHARA Suwako (上原 寿和子)		
Wed 水	1					
	2	Japanese Language (日本語)	CIPE			
	3	Japanese Language (日本語)	CIPE			
	4	Japanese Language (日本語)	CIPE			
	5					
Thu 木	1	UEC Academic Skills III (Publishing Literacy and Research)	CIPE	CHOO		For 2nd semester students only
	2	Advanced Communication Engineering and Informatics III (Computational Complexity)	I	TARUI Jun (垂井 淳)		
	3	Advanced Communication Engineering and Informatics IV (Computer Algorithms)	I	KOBAYASHI Satoshi (小林 聡)		
		Experimental Electronics Laboratory	S	KISHIMOTO Tetsuo (岸本 哲夫) VOHRA Varun	Face to Face only	
	5	Topics in Mechanical and Intelligent Systems Engineering II (The Human Brain as Intelligent Machines)	M	MIYAWAKI Yoichi (宮脇 陽一)		
Fri 金	1	Japanese Language (日本語)	CIPE			
	2	Japanese Language (日本語)	CIPE			
	3					
	4					
	5	International Communication for Science and Technology	I	MATSUURA Motoharu (松浦 基晴) ISHIBASHI Koichiro (石橋 孝一郎)		* Some lesson might will be conducted in Japanese (course materials in English)
		English for Interpersonal Communication	HLSS	Eric Hauser		
Intensive Course		Topics in Mechanical and Intelligent Systems Engineering I (Advanced Robotics and Mechatronics Engineering)	M	AOYAMA Hisayuki (青山 尚之), et al.		* Start in the middle of Nov for 2 weeks in 5th and 6th periods

* Joint classes with regular graduate students

Department 学科等

J: Department of Informatics (情報学専攻)

I: Department of Computer and Network Engineering (情報・ネットワーク工学専攻)

M: Department of Mechanical and Intelligent Systems Engineering (機械知能システム学専攻)

S: Department of Engineering Science (基盤理工学専攻)

CIPE: Center for International Programs and Exchange (国際教育センター)

SPORTS: UEC Physical Education Division (健康・スポーツ科学部会)

HLSS: The Division of Humanities Languages and Social Sciences (総合文化部会)

Period 授業時間 (JST)

1: 9:00-10:30

2: 10:40-12:10

3: 13:00-14:30

4: 14:40-16:10

5: 16:15-17:45

6: 17:50-19:20

7: 19:30-21:00

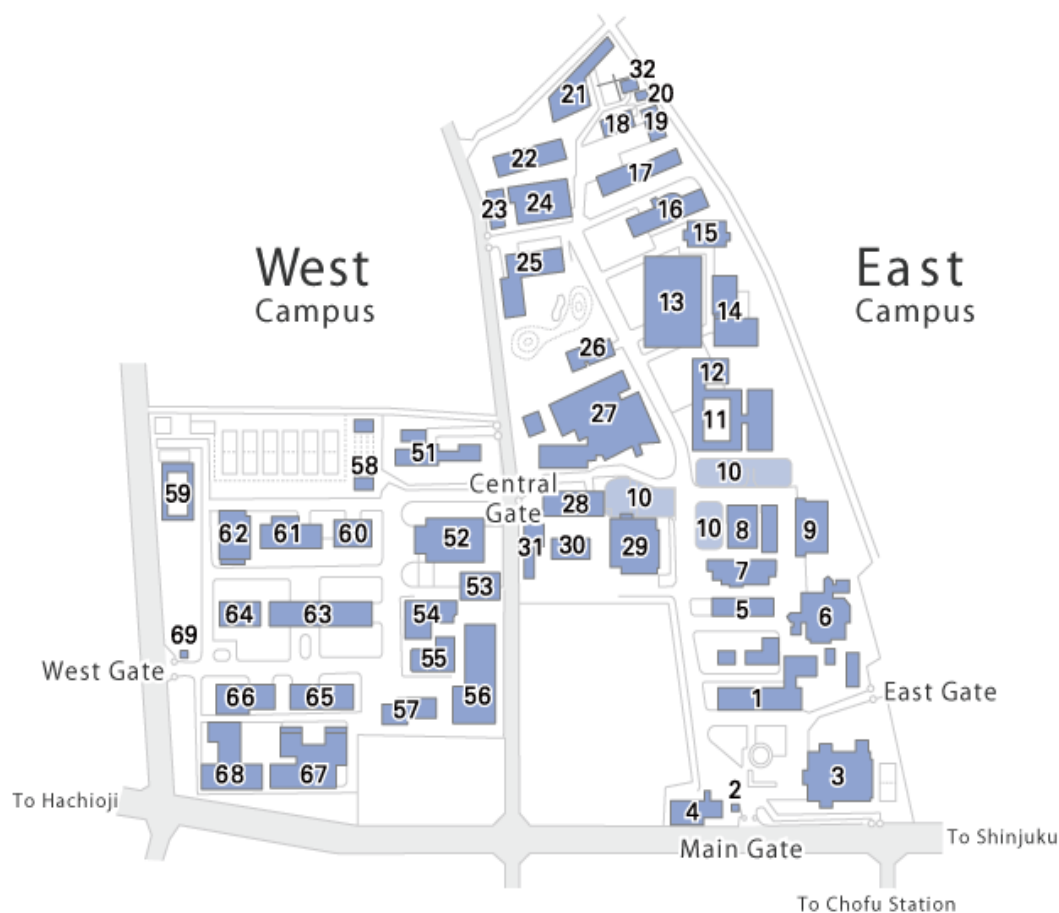
Home University's Time Zone

Tokyo (JST)	China, Taiwan	Germany, Sweden	America, Mexico	Estonia	Thai, Vietnam, Indonesia
	minus 1 hour	minus 7 hours (Mar-Oct) minus 8 hours (standard)	minus 14 hours (Mar-Oct) minus 15 hours (standard)	minus 6 hours (Apr-Oct) minus 7 hours (standard)	minus 2 hours
9:00-10:30 1st Period	8:00-9:30	2:00-3:30 1:00-2:30	19:00-20:30 18:00-19:30	3:00-4:30 2:00-3:30	7:00-8:30
10:40-12:10 2nd Period	9:40-11:10	3:40-5:10 2:40-4:10	20:40-22:10 19:40-21:10	4:40-6:10 3:40-5:10	8:40-10:10
13:00-14:30 3rd Period	12:00-13:30	6:00-7:30 5:00-6:30	23:00-0:30 22:00-23:30	7:00-8:30 6:00-7:30	11:00-12:30
14:40-16:10 4th Period	13:40-15:10	7:40-9:10 6:40-8:10	0:40-2:10 23:40-1:10	8:40-10:10 7:40-9:10	13:40-14:10
16:15-17:45 5th Period	15:15-16:45	9:15-10:45 8:15-9:45	2:15-3:45 1:15-2:45	10:15-11:45 9:15-10:45	14:15-15:45
17:50-19:20 6th Period	16:50-18:20	10:50-12:20 9:50-11:20	3:50-5:20 2:50-4:20	11:50-13:20 10:50-12:20	15:50-17:20

The time zone that is not suitable for a student to take a course

Grey time zone

UEC CAMPUS MAP



- Main Building (1)
- Auditorium (3)
- 80th Anniversary Memorial Hall (4)
- Building E-1 (7)
- Building E-2 (28)
- Building E-3 (27)
- Building E-4 (11)
- Building E-5 (12)
- Building E-6 (13)
- Building E-7 (14)
- Building E-8 (15)
- Building E-9 (16)
- Building E-10 (17)
- Building A (5)
- Building B (6)
- Building C (8)
- Building D (9)
- Communication Park (10)
- University Center (29)
- Health Care Center (26)
- International House (21)
- Facilities for Extracurricular Activities (22)
- Judo Gymnasium (31)
- Personnel Clubhouse (20)
- Child-Care Facility (32)
- Building E-31 (18)
- Building E-32 (19)
- Building E-33 (23)
- Building E-34 (24)
- Building E-35 (25)
- Building E-36 (30)
- Security Office of the Main Gate (2)
- Building W-1 (65)
- Building W-2 (63)
- Building W-3 (66)
- Building W-4 (64)
- Building W-5 (54)
- Building W-6 (60)
- Building W-7 (61)
- Building W-8 (67)
- Building W-9 (68)
- Building W-10 (56)
- Building W-11 (62)
- Gymnasium (52)
- Gymnasium II (53)
- Archery Facility (58)
- Swimming Pool (59)
- West Cafeteria (55)
- Student Dormitory (51)
- Building W-31 (57)
- Security Office of West Gate (69)
- Center for International Programs and Exchange (28)
- University Library (27)
- Information Technology Center (27)
- Coordinated Center for UEC Research Facilities (13)
- Center for Industrial and Governmental Relations (14)
- Advanced Wireless Communication Research Center (17)
- UEC Museum of Communication (17)
- Center for Developing e-Learning (66)
- Institute for Laser Science (61)
- Center for Community Relations (1)
- Innovation Research Center for Fuel Cells (16)
- Center for Photonic Innovation (62)
- Research Center for Ubiquitous Networking and Computing (66)
- Advanced Ultrafast Laser Research Center (62)

Japanese Language

General Information

Course title (Japanese)	日本語		
Course title (English)	Japanese Language		
Course Code			
Academic year	2020	Year offered	1/2/3/4
Semester(s) offered	Fall semester	Faculty offering the course	School of Informatics and Engineering
Teaching method	Lecture	Credits	Based on the seated time
Category	General culture subjects		
Cluster/Department	JUSST Program		
Lecturer(s)	内藤 真理子, 笠原 ゆう子 and et al.		
Office	East 2-213 (内藤) , East 2-215 (笠原)		
e-mail	内藤真理子<naito-m@vsb.fedu.uec.ac.jp>, 笠原ゆう子<ykasahara@uec.ac.jp>		
Course website	NIL		
Last updated	2020/04/24 20:03:46	Update status	Released

Course Description

Topic and goals	Students will learn the basic grammar, daily use vocabulary and comprehensive in an intensive manner (自分の考えや情報が的確に伝えられる日本語を習得する).
Prerequisites	NIL
Recommended prerequisites and preparation	NIL
Course textbooks and materials	Texts and materials will be provided
Course outline and weekly schedule	<p>A placement test will be taken before courses begin and students will be assigned to a class, as shown below, based on their Japanese language level.</p> <ul style="list-style-type: none"> • Japanese Language Elementary I • Japanese Language Elementary II • Japanese Language Intermediate I • Japanese Language Intermediate II • Japanese Language Advanced <p>The course content, schedule and other information will be provided after the class assigning.</p>
Course content utilizing practical experience	
Preparation and review outside class	
Evaluation and grading	
Office hours	
Message for students	
Others	
Keyword(s)	

UEC Academic Skills I (Computer Literacy)

General Information

Course title (Japanese)	UEC Academic Skills I (Computer Literacy) (上級科目)		
Course title (English)	UEC Academic Skills I (Computer Literacy)		
Course Code	INT001z INT101z		
Academic year	2020	Year offered	3/4
Semester(s) offered	Spring semester	Faculty offering the course	School of Informatics and Engineering
Teaching method	Lecture	Credits	2
Category	General culture subjects		
Cluster/Department	School of Informatics and Engineering		
Lecturer(s)	Choo Cheow Keong		
Office	E2-305		
e-mail	uec-as1@fedu.uec.ac.jp		
Course website	http://www.fedu.uec.ac.jp/skills		
Last updated	2020/03/13 21:11:34	Update status	Released

Course Description

Topic and goals	This course gives the students the intermediate-advanced knowledge of computer systems and computer networks in a typical academic environment. The lecture stresses fundamental tools and techniques that are applicable to a broad reach of systems such as the use of primitive, but powerful tools as UNIX shell, HTML, LaTeX.
Prerequisites	NIL
Recommended prerequisites and preparation	コンピューターリテラシー Computer literacy
Course textbooks and materials	NIL
Course outline and weekly schedule	<p>授業Contents Course schedule and topics that will be covered</p> <p>=====</p> <ol style="list-style-type: none"> 1. Introduction (Usage: The Information Technology Center ITC, UEC campus network use policies) 2. Computer operating system and Tools (fundamentals) 3. Unix operating system (fundamentals) 4. Unix operating system (The Internet and computer network) 5. Word Processing (Basic; Desktop publishing, WYSIWYG, and LaTeX) 6. LaTeX (Environments and layout; LaTeX commands, Structure, Package, Class, style, Text typesetting) 7. LaTeX (Mathematical Formulas) 8. LaTeX (Displayed; Lists, Tabulator, Tables) 9. LaTeX (Displayed; Graphics, Drawing) 10. LaTeX (Labels, Cross-referencing, Citations and Bibliography) 11. World Wide Web (Overview; Web systems, applications, HTML) 12. HTML (Basic; Structure, Tag, color, typesetting) 13. HTML (Links and Multimedia; Images, Sound, and Movies) 14. HTML (List, Tables and Interactivity, Cascading Style Sheet; CSS) 15. HTML (Project Work) <p>=====</p> <p>This is a lecture-lab course in which the instructor presents the topics, and the students complete the assignments during lab periods or outside of class. The content is intended to be a lecture in combination with a practical exercise ("learn, practice, implement and apply") that will cover the basic usage of the UNIX system, and including how to write in LaTeX and HTML.</p>

	Note that the lecture schedule is subject to constant revisions throughout the course.
Course content utilizing practical experience	
Preparation and review outside class	Students are required to create/design a homepage and present it in class at the end of the semester. Thus, student may need some extra time to create the homepage.
Evaluation and grading	<p>Evaluation is given as follows; (Tasks 50%, Mid-Semester presentation 30%, Final presentation 20%)</p> <p>Since this course is a practical course, attendance and participation in class is obligatory. Only students who have 1) maintained at least 70% of attendance, 2) submitted all the assignments and 3) made their Mid-semester & final presentations can obtain the credits.</p>
Office hours	12:00-13:00, for just-in-case, schedule an appointment before walking in.
Message for students	We expect students to be the active part of the learning process. We encourage the students' participation in class discussions, asking questions and interacting with others. If you have any comments on the topics covered, please feel free to share with the others in class.
Others	Students are expected to come to class on time. Absences are excused in case of emergency, illness, or trips to conferences.
Keyword(s)	Unix, HTML, Latex, Website

UEC Academic Skills II (Information Literacy and Research)

General Information

Course title (Japanese)	UEC Academic Skills II (Information Literacy and Research) (上級科目)		
Course title (English)	UEC Academic Skills II (Information Literacy and Research)		
Course Code	INT002z		
Academic year	2020	Year offered	3/4
Semester(s) offered	Spring semester	Faculty offering the course	School of Informatics and Engineering
Teaching method	Lecture	Credits	2
Category	General culture subjects		
Cluster/Department	School of Informatics and Engineering		
Lecturer(s)	Choo Cheow Keong		
Office	E2-305		
e-mail	uec-as2@fedu.uec.ac.jp		
Course website	http://www.fedu.uec.ac.jp/skills		
Last updated	2020/03/13 21:16:02	Update status	Released

Course Description

Topic and goals	This course is designed to foster students' ability to identify, evaluate and use diverse information sources effectively in science and engineering studies. It involves the knowledge of information technology tools and their application to research. Students are required to give a poster presentation on their major study or research at the end of the semester.
Prerequisites	UEC Academic Skills I (Computer Literacy) or コンピューターリテラシー
Recommended prerequisites and preparation	NIL
Course textbooks and materials	NIL
Course outline and weekly schedule	<p>Contents Course schedule and topics that will be covered</p> <p>=====</p> <ol style="list-style-type: none"> 1. Introduction (Usage: The Information Technology Center etc.) 2. Scientific literatures and resources retrieval (UEC Library) 3. Mind mapping, brain storming 4. Academic Integrity (Referencing, citing, create bibliographies) 5. Managing and sharing resources 6. Writing a research proposal 7. Scientific drawing, Charts, Diagrams and Timelines (Inkscape, GIMP) 8. Tables, Graphs (SciDAVis) 9. Desktop publishing for scientific poster (Scribus) 11. Creating effective scientific poster 12. Formula editor (word processing) 12. Writing an Abstract for a research 13. Preparation for presentation 14. Poster presentation 1/2 15. Poster presentation 2/2 <p>=====</p> <p>The course introduces the use of some powerful tools for scientific research and engineering, field. The lectures include hands-on learning and applicable exercises that assumes no any previous experience or training, so the initial emphases are on the use of the basic scientific software and the basic research procedures.</p> <p>Note that the lecture schedule is subject to constant revisions throughout the course.</p>

Course content utilizing practical experience	
Preparation and review outside class	Students have to read 1 to 3 articles about varied topics, and at the end of the semester, the students are expected to make a postal presentation.
Evaluation and grading	<p>Evaluation is given as follows; (Assignments 50%, midterm presentation 20%, Poster presentation 30%)</p> <p>Since this course is a practical course, attendance and participation in class is obligatory. Only students who have 1) maintained at least 70% of attendance, 2) submitted all the assignments and 3) made their poster presentations can obtain the credits.</p>
Office hours	12:00-13:00, for just-in-case, schedule an appointment before walking in.
Message for students	We expect students to be the active part of the learning process. We encourage the students' participation in class discussions, asking questions and interacting with others. If you have any comments on the topics covered, please feel free to share with the others in class.
Others	Students are expected to come to class on time. Absences are excused in case of emergency, illness, or trips to conferences.
Keyword(s)	Research, library, Desktop publishing, poster presentation

UEC Academic Skills III (Publishing Literacy and Research)

General Information

Course title (Japanese)	UEC Academic Skills III (Publishing Literacy and Research)		
Course title (English)	UEC Academic Skills III (Publishing Literacy and Research)		
Course Code	INT003z		
Academic year	2020	Year offered	3/4
Semester(s) offered	Fall semester	Faculty offering the course	School of Informatics and Engineering
Teaching method	Lecture	Credits	2
Category	General culture subjects		
Cluster/Department	School of Informatics and Engineering		
Lecturer(s)	Choo Cheow Keong		
Office	E2-305		
e-mail	uec-as3@fedu.uec.ac.jp		
Course website	http://www.fedu.uec.ac.jp/skills		
Last updated	2020/03/13 21:24:06	Update status	Released

Course Description

Topic and goals	This course focuses attention on the exercise of strategic research project. Students are required to carry out a study/research project for more than a half of year with a specific topic. Then, they have to proceed their own project after they choose their own topic and make a monthly plan. At the end of the semester, there will be an international mini-conference that has participants of all the JUSST Exchange Students and other regular UEC Students.
Prerequisites	UEC Academic Skills I (Computer Literacy) or コンピュータリテラシー
Recommended prerequisites and preparation	UEC Academic Skills II (Information Literacy and Research)
Course textbooks and materials	NIL
Course outline and weekly schedule	<p>Contents Course schedule and topics that will be covered</p> <p>=====</p> <ol style="list-style-type: none"> 1. Introduction (Usage: The Information Technology Center etc.) 2. Academic Integrity (Interesting and Unpublished, Scientific misconduct) 3. Researcher's outputs (Why, How, Where) 4. Planning the research/research protocol (LaTeX editor, Mind mapping, brainstorming etc.) 5. Proposing and Reporting on Research 6. Making scientific presentation 7. Midterm Presentation 1/2 8. Midterm Presentation 2/2 9. Brush up on your skills (Handling Q&A) 10. Communication and Correspondence (Peer, Researcher, Editor, etc.) 11. Academic publishing (Overviews; Dissertation, Monograph, Scientific paper) 12. Academic publishing (Procedures, Processes and standards) 13. Assessment and evaluation 14. Oral presentation 1/2 15. Oral presentation 2/2 <p>=====</p> <p>The lecture is designed to support the pursuit of writing research paper and share the skills of quality publishing. All the lectures are linked with practical activities, and at the end of the course, the students are required to write a paper and give a presentation on their research-based projects.</p> <p>Note that the lecture schedule is subject to constant revisions throughout the course.</p>

Course content utilizing practical experience	
Preparation and review outside class	<p>Students have to read 2 to 3 articles about varied topics and at the mid and end of the semester, the students are expected to give an oral presentation.</p> <p>For laboratory assigned students, the essential project hours are estimated for more than 8 hours a week, where this is the same standard of graduate thesis project.</p>
Evaluation and grading	<p>Evaluation is given as follows; (Assignments 40%, Writing paper 30%, Oral presentation 30%)</p> <p>Since this course is a practical course, attendance and participation in class is obligatory. Only students who have 1) maintained at least 70% of attendance, 2) submitted the writing paper and 3) made their final presentations can obtain the credits.</p>
Office hours	12:00-13:00, for just-in-case, schedule an appointment before walking in.
Message for students	We expect students to be the active part of the learning process. We encourage the students' participation in class discussions, asking questions and interacting with others. If you have any comments on the topics covered, please feel free to share with the others in class.
Others	Students are expected to come to class on time. Absences are excused in case of emergency, illness, or trips to conferences.
Keyword(s)	Research, Publishing paper, oral presentation

Preparation for Graduate School

General Information

Course title (Japanese)	Preparation for Graduate School		
Course title (English)	Preparation for Graduate School		
Course Code	ENG604z		
Academic year	2020	Year offered	3/4
Semester(s) offered	Fall semester	Faculty offering the course	School of Informatics and Engineering
Teaching method	Lecture	Credits	2
Category	General culture subjects		
Cluster/Department	School of Informatics and Engineering		
Lecturer(s)	UEHARA Suwako (上原 寿和子)		
Office	East 1-803		
e-mail	uehara.suwako@uec.ac.jp		
Course website			
Last updated	2020/03/10 10:41:53	Update status	Released

Course Description

Topic and goals	This is a course for learners who intend to pursue a graduate course. The aim is to search and collect information related to one's graduate school admission, and the kinds of English one may use in your future lab. Through a survey or interview with professors and future lab members, learners will collect data and report to the course members in a form of a presentation in English. Learners will also select and read academic papers, and provide a summary and conduct discussions in small groups. Learners should aim to complete self-set goals autonomously. By the end of the course, each learner will have a portfolio related to preparing to English for graduate school admission, and English learning goals planned and achieved.
Prerequisites	Academic Spoken English I Academic Spoken English II Academic Written English I Academic Written English II English Seminar
Recommended prerequisites and preparation	Academic Spoken English I Academic Spoken English II Academic Written English I Academic Written English II English Seminar
Course textbooks and materials	There is no textbook, and necessary materials will be provided in class. Students will also be required to investigate academic papers in English that is related to their interest.
Course outline and weekly schedule	Week 1: Introduction to Preparation for Graduate School (Overview, Login to Edmodo, Goal setting, Evaluation) Week 2: Self Assessment (Discussion) Week 3: Talk by graduate students Week 4: Presentation skills Week 5: Proximal and distal goals Week 6: Review presentation content and performance Week 7: Work on the essentials 1 (Write your CV) Week 8: Work on the essentials 2 (Practice interview skills) Week 9: Reading Summary and Discussion I (speed reading) Week10: Reading Summary and Discussion II (speed reading and critical review) Week 11: Needs Analysis 1 Academic Publication: Where to publish? What style to use? Latex Week 12: Submission sample (IEICE): Needs Analysis 1 Week 13: Needs Analysis 2 Survey or interview with a professor or lab member Week 14: Needs Analysis 3 Requirements for entering grad school/Finding a job Week 15: Needs Analysis Report: Student selection (Schedule subject to change)

Course content utilizing practical experience	
Preparation and review outside class	In addition to other assignments, students will prepare spoken summaries in English.
Evaluation and grading	Evaluation: Participation in class (discussion, attitude, teamwork): 10% Academic vocabulary: 10% Academic paper selection: 20% Needs analysis report: 30% Summary and discussion: 30%
Office hours	Friday 3rd period or by appointment.
Message for students	This class will be taught through English.
Others	Nothing.
Keyword(s)	preparation, graduate school, English

English for Interpersonal Communication

General Information

Course title (Japanese)	English for Interpersonal Communication		
Course title (English)	English for Interpersonal Communication		
Course Code	ENG603z		
Academic year	2020	Year offered	3/4
Semester(s) offered	Fall semester	Faculty offering the course	School of Informatics and Engineering
Teaching method	Lecture	Credits	2
Category	General culture subjects		
Cluster/Department	School of Informatics and Engineering		
Lecturer(s)	Hauser Eric		
Office	East 1-614		
e-mail	hauser@bunka.uec.ac.jp		
Course website	None.		
Last updated	2020/02/20 11:17:48	Update status	Released

Course Description

Topic and goals	The primary goal of this class is to develop students' ability to use English in conversation and discussions. Other goals include learning about how people participate in conversation, understanding each student's own motivation to learn English, and developing writing ability.
Prerequisites	All required first-year and second-year English courses. (This does not apply to students who are not required to take these courses.)
Recommended prerequisites and preparation	Intermediate Seminars in English (英語演習)
Course textbooks and materials	There is no textbook.
Course outline and weekly schedule	<p>Week 1: Introduction to the class; discussion activities</p> <p>Week 2: Lecture on motivation in language learning</p> <p>Week 3: Discussion of students' motivation to learn English</p> <p>Week 4: Writing assignment on motivation due; conversation activities</p> <p>Week 5: First video-recorded conversation due; first lecture on the organization of conversation</p> <p>Week 6: First writing assignment on organization of conversation due; evaluating participation in first video-recorded conversation</p> <p>Week 7: Evaluating participation in first video-recorded conversation</p> <p>Week 8: Self-evaluation of first video-recorded conversation due; second video-recorded conversation due; second lecture on the organization of conversation</p> <p>Week 9: Second writing assignment on the organization of conversation due; evaluating participation in second video-recorded conversation</p> <p>Week 10: Evaluating participation in second video-recorded conversation</p> <p>Week 11: Self-evaluation of second video-recorded conversation due; third video-recorded conversation due; third lecture on the organization of conversation</p> <p>Week 12: Third writing assignment on the organization of conversation due; evaluating participation in third video-recorded conversation</p> <p>Week 13: Evaluating participation in third video-recorded conversation</p> <p>Week 14: Evaluating participation in third video-recorded conversation</p> <p>Week 15: Self-evaluation of third video-recorded discussion due; class wrap-up</p>
Course content utilizing practical experience	
Preparation and review outside class	There will be writing assignments outside class. Also, students will participate in and video-record conversations outside class.
Evaluation and grading	<p>Writing assignments: 40% (10% each)</p> <p>Video-recorded conversations: 15% (5% each)</p> <p>Self-evaluation of video-recorded conversations: 45% (15% each)</p>

Office hours	Tuesday, 4th period, or by appointment
Message for students	This class is for students who are interested in speaking English with other people. You do not need to be good at using English, but you do need to be willing to try to use English.
Others	Both international students and Japanese students are welcome in this class.
Keyword(s)	communication, conversation, discussion, motivation

Topics in Informatics I (Evolutionary Computation)

General Information

Course title (Japanese)	Topics in Informatics I (Evolutionary Computation) (学域)		
Course title (English)	Topics in Informatics I (Evolutionary Computation)		
Course Code	INT004a INT004b INT004e		
Academic year	2020	Year offered	3/4
Semester(s) offered	Fall semester	Faculty offering the course	School of Informatics and Engineering
Teaching method	Lecture	Credits	2
Category	Core subjects		
Cluster/Department	Cluster I (Informatics and Computer Engineering)/Cluster II (Emerging Multi-interdisciplinary Engineering)		
Lecturer(s)	佐藤 寛之		
Office	W6-205		
e-mail	h.sato@uec.ac.jp		
Course website	WebClass		
Last updated	2020/03/02 12:07:55	Update status	Released

Course Description

Topic and goals	Evolutionary computation is a bio-inspired computation methodology and categorized as a part of computational intelligence. Evolutionary computation treats information as genes of organisms, and evolve it inside the computer. The primary usage of evolutionary computation is optimization. As representative industrial applications, the front nose design of the Shinkansen N700 and the wing design of the Mitsubishi regional jet (MRJ) were optimized by evolutionary computation. Evolutionary optimization can be applied even if the characteristic of the target optimization problem is unknown. This course provides lectures of evolutionary algorithms from classic to the latest ones, types of optimization problems, their handling methods in evolutionary algorithms, and implementation techniques. The goals of the class are to be able to recognize the types of optimization problems, select appropriate evolutionary algorithms, and implement one of these algorithms.
Prerequisites	The course has computer exercises involving programming. Students need to know at least one programming language.
Recommended prerequisites and preparation	Computer literacy, Fundamental programming
Course textbooks and materials	Materials are distributed by using WebClass system.
Course outline and weekly schedule	<ol style="list-style-type: none"> 1. Introduction to Evolutionary Computation 2. Optimization Problems 3. MATLAB Programming 4. Hill Climbing 5. Genetic Algorithms 6. Evolutionary Programming 7. Evolution Strategies 8. Genetic Programming 9. Evolutionary Algorithm Variations 10. Simulated Annealing 11. Particle Swarm Optimization 12. Differential Evolution 13. Estimation of Distribution Algorithm 14. Evolutionary Multi-objective Optimization 15. Other Applications and Futures of Evolutionary Computation

Course content utilizing practical experience	
Preparation and review outside class	Review and computer exercises are needed after the weekly class.
Evaluation and grading	<p>Report submissions related to computer exercises are required. The reports are scored, and the evaluation is decided by the followings (100 points maximum).</p> <p>S: ≥ 90 points A: ≥ 80 points B: ≥ 70 points C: ≥ 60 points D: < 60 points</p>
Office hours	Tuesday, 10:40-12:10. Please make sure to make an appointment by e-mail before visiting the lecturer.
Message for students	N/A
Others	N/A
Keyword(s)	Evolutionary computation, evolutionary algorithm, optimization, computational intelligence

Advanced Communication Engineering and Informatics III (Computational Complexity)

General Information

Course title (Japanese)	Advanced Communication Engineering and Informatics III (学域) (Computational Complexity)		
Course title (English)	Advanced Communication Engineering and Informatics III (Computational Complexity)		
Course Code	INT003c INT003d INT003f INT003g		
Academic year	2020	Year offered	3/4
Semester(s) offered	Fall semester	Faculty offering the course	School of Informatics and Engineering
Teaching method	Lecture	Credits	2
Category	Core subjects		
Cluster/Department	Cluster I (Informatics and Computer Engineering)/Cluster II (Emerging Multi-interdisciplinary Engineering)		
Lecturer(s)	TARUI Jun (垂井 淳)		
Office	E3-824		
e-mail	juntarui0@gmail.com		
Course website	www.jtlab.cei.uec.ac.jp		
Last updated	2020/03/01 19:48:41	Update status	Released

Course Description

Topic and goals	In the academic year of 2020, the subject of this course will be Computational Complexity, which studies questions such as "Which computational problems have efficient algorithms?" and "Do quantum computers have more computational power than classical computers?" The course will be an introduction to Computational Complexity, and will cover a wide spectrum of topics.
Prerequisites	none
Recommended prerequisites and preparation	Students should have taken an introductory course on algorithms, and should have written at least one computer program.
Course textbooks and materials	none
Course outline and weekly schedule	<p>In the first half of the course, we will discuss the following various algorithmic paradigms:</p> <ol style="list-style-type: none"> (1) learning algorithms (2) randomized algorithms (3) approximation algorithms <p>In the second half, we will discuss the following:</p> <ol style="list-style-type: none"> (1) complexity classes including important classes P and NP (2) theory of NP-completeness (3) theoretical cryptography <p>More specific plan of 15 lectures is as follows. I will somewhat fine-tune the lecture plan after finding out backgrounds of actual class attendees.</p> <ol style="list-style-type: none"> 1. overview, review of algorithm analysis 2. review of sorting algorithms and their analysis 3. explanation of programming project 4. learning algorithm (1): learning axis-parallel rectangles 5. learning algorithm (2): PAC learning paradigm 6. learning algorithm (3): learning conjunctions and DNFs 7. student presentation of programming project 8. randomized algorithm 9. approximation algorithm 10. complexity classes P and NP 11. NP-completeness (1): reduction

	12. NP-completeness (2): 3SAT 13. NP-completeness (3): 3coloring 14. cryptography 15. P vs NP conjecture
Course content utilizing practical experience	
Preparation and review outside class	at least 1.5 hour/week expected
Evaluation and grading	Grading will be based on biweekly homework reports and one programming project. To pass the course, you have to understand at least two-thirds of the topics in class well enough to the extent that you can give simple examples for explanation, and you have to complete well at least two-thirds of your homework.
Office hours	TBA
Message for students	Regular UEC students from all departments are very much welcome.
Others	If you have questions about this course, please feel free to ask me by email.
Keyword(s)	algorithm, computational complexity, learning algorithm, NP-completeness

Advanced Communication Engineering and Informatics IV (Computer Algorithms)

General Information

Course title (Japanese)	Advanced Communication Engineering and Informatics IV (Computer Algorithms) (学域)		
Course title (English)	Advanced Communication Engineering and Informatics IV (Computer Algorithms)		
Course Code	INT004c INT004d INT004f INT004g		
Academic year	2020	Year offered	3/4
Semester(s) offered	Fall semester	Faculty offering the course	School of Informatics and Engineering
Teaching method	Lecture	Credits	2
Category	Core subjects		
Cluster/Department	Cluster I (Informatics and Computer Engineering)/Cluster II (Emerging Multi-interdisciplinary Engineering)		
Lecturer(s)	KOBAYASHI Satoshi (小林 聡)		
Office	W9-735		
e-mail	kobayashi.satoshi@uec.ac.jp		
Course website	http://www.comp.cs.uec.ac.jp/lectures/		
Last updated	2020/03/02 17:47:09	Update status	Released

Course Description

Topic and goals	<p>The purpose of this lecture is provide the theory and technique to design efficient algorithms for various fundamental problems.</p> <p>The goals of the students are to achieve the following points:</p> <p>(1) to understand the behavior, correctness, and time complexity analysis of the algorithms discussed in the lecture,</p> <p>(2) to understand the principles of design methodologies of algorithms, such as dynamic programming, greedy method, etc.</p>
Prerequisites	Registered students should have ability to write C programs. Furthermore, the knowledge about some basic data structures (list, binary tree, heap, etc.) and basic algorithms (sorting, etc.) are required.
Recommended prerequisites and preparation	None
Course textbooks and materials	Some handouts are provided at the lecture.
Course outline and weekly schedule	<p>(a) Contents of the lecture</p> <p>[1] Minimum spanning tree problem and greedy algorithms</p> <p>[2] Correctness of Prim's and Kruskal's algorithm</p> <p>[3] Greedy algorithms for other problems</p> <p>[4] Shortest path problem and Dynamic Programming (DP)</p> <p>[5] DP Method (1) --- Transform DFAs to regular expressions</p> <p>[6] DP Method (2) --- Context-free grammar and its recognition problem</p> <p>[7] DP Method (3) --- CYK algorithm for CFG recognition</p> <p>[8] DP Method (4) --- Hidden Markov Models (HMM)</p> <p>[9] DP Method (5) --- Recognition problem of HMM</p> <p>[10] DP Method (6) --- HMM recognition algorithm</p> <p>[11] DP Method (7) --- Approximate string matching algorithms</p> <p>[12] String matching problem</p> <p>[13] Computing failure functions in KMP algorithm</p> <p>[14] Correctness and time complecity of KMP algorithm</p> <p>[15] Summary and conclusion of this lecture</p> <p>(b) How does this lecture proceed?</p>

	For each problem, we first discuss on its background and motivation, and then give an algorithm for the problem. The correctness and time complexity analysis of the given algorithm will be discussed in details. Example runs will be used to enrich the understanding.
Course content utilizing practical experience	
Preparation and review outside class	Implement algorithms given in the the lecture, if possible.
Evaluation and grading	Academic performance is evaluated by exams. The lowest standard is 60%.
Office hours	Any time, but appointments by e-mails are necessary.
Message for students	None
Others	None
Keyword(s)	Dynamic programming, greedy algorithms, context free grammars, HMM, string matching, etc.

Experimental Electronics Laboratory

General Information

Course title (Japanese)	Experimental Electronics Laboratory (学域)		
Course title (English)	Experimental Electronics Laboratory		
Course Code	INT401k INT401m INT401n INT401p		
Academic year	2020	Year offered	2/3/4
Semester(s) offered	Fall semester	Faculty offering the course	School of Informatics and Engineering
Teaching method	Practical (Experiment)	Credits	2
Category	Core subjects		
Cluster/Department	Cluster III (Fundamental Science and Engineering)		
Lecturer(s)	KISHIMOTO Tetsuo (岸本 哲夫), VOHRA Varun		
Office	Building East 6, Room 628		
e-mail	kishi(at)pc.uec.ac.jp, varun.vohra(at)uec.ac.jp		
Course website	none		
Last updated	2020/02/21 09:31:34	Update status	Released

Course Description

Topic and goals	This course aims for providing the students, who may have no practical knowledge of electrical circuits, with the basics of analog and digital electronics through hands-on experience.
Prerequisites	Basic Electronics
Recommended prerequisites and preparation	Analysis, especially complex numbers.
Course textbooks and materials	Instruction manual in text materials or a pdf file will be provided at the class.
Course outline and weekly schedule	<p>A student builds the following electrical circuits on the solderless breadboard. He or she then measures and analyzes various properties. The experiments are carried out every other week, and classroom discussion is held in between.</p> <ol style="list-style-type: none"> 1) Measurement of resistance. 2) Measurement of complex impedance for C and L. 3) Resonant behavior of LC-circuits. 4) Transmit radio signals and receive them using LC-circuits. 5) Transistor and LED. 6) Operation amplifier and its applications.(transmit and receive sound signal using LEDs). 7) Logic gates.
Course content utilizing practical experience	
Preparation and review outside class	Please study on the basic technical terms of the IC you will work on each week.
Evaluation and grading	It is mandatory to finish all the projects listed above in order to acquire the credit. The score rate is 80%, where the attitude toward the experiment is also taken into account. The student must submit a report on the project within a week, which is subject to either quick, oral examination with the lecturer or open discussion in which every student is to participate. This post-laboratory step will be assessed at a rate of 15%. The pre-laboratory test will also be assessed (5%).
Office hours	<p>Please make an appointment before coming to my office.</p> <p>Contact: Bldg-E6, room 628 Ext:5449, kishi(at)pc.uec.ac.jp</p>
Message for students	Electronic circuits are fun to play with.
Others	The course has originally been designed for JUSST students, but regular students can take it.
Keyword(s)	complex impedance, inductor, capacitor, logic gate, operational amplifier, bipolar junction transistor.

Topics in Mechanical and Intelligent Systems Engineering II (The human brain as intelligent machines)

General Information

Course title (Japanese)	Topics in Mechanical and Intelligent Systems Engineering II (The human brain as intelligent machines) (学域)		
Course title (English)	Topics in Mechanical and Intelligent Systems Engineering II (The human brain as intelligent machines)		
Course Code	INT003h INT003i INT003j		
Academic year	2020	Year offered	3/4
Semester(s) offered	Fall semester	Faculty offering the course	School of Informatics and Engineering
Teaching method	Lecture	Credits	2
Category	Core subjects		
Cluster/Department	Cluster II (Emerging Multi-interdisciplinary Engineering) /Cluster III (Fundamental Science and Engineering)		
Lecturer(s)	MIYAWAKI Yoichi (宮脇 陽一)		
Office	East 4-620		
e-mail	yoichi.miyawaki@uec.ac.jp		
Course website	None		
Last updated	2020/03/17 21:54:19	Update status	Released

Course Description

Topic and goals	The human brain is considered as one of the most intelligent "machines." In this lecture, we explore how the human brain is receiving, processing, and producing signals that are used to sense, perceive, feel, and make actions. In particular, we will focus on the visual information processing systems in the human brain (the visual cortex) and learn how the visual cortex works from the basic viewpoints. We would also focus on methodological aspects of analysis of the human brain function, particularly on the topics of non-invasive signal acquisition of human brain activity using electroencephalography (EEG), magnetoencephalography (MEG), and functional magnetic resonance imaging (fMRI), together with computational analysis of these signals and computational modeling of neural signal processing. We might refer and ask students to read and introduce (in the form of presentation) the recent literature to achieve the goal.
Prerequisites	None
Recommended prerequisites and preparation	None
Course textbooks and materials	None, but the following textbook might help students to understand the topics: [1] Jeremy M. Wolfe, Keith R. Kluender, Dennis M. Levi, Linda M. Bartoshuk, Rachel S. Herz, Roberta L. Klatzky and Daniel M. Merfeld, "Sensation & Perception (5th edition)," Sinauer Associates (2017) [2] Peter Dayan and Laurence F. Abbott, "Theoretical Neuroscience: Computational and Mathematical Modeling of Neural Systems," The MIT Press (2005) [3] Scott A. Huettel, Allen W. Song, Gregory McCarthy, "Functional Magnetic Resonance Imaging," Sinauer Associates (2008)
Course outline and weekly schedule	The following contents may vary depending on progress of students: [1] Introduction [2] Basics of our visual perception [3] Evaluation of our subjective sensation/perception (1): metrics [4] Evaluation of our subjective sensation/perception (2): psychophysical procedures [5] Exercise of psychophysical experiment (1): survey of visual illusions [6] Exercise of psychophysical experiment (2): introduction of Psychtoolbox and/or PsychoPy [7] Exercise of psychophysical experiment (3): performing test experiments [8] Student presentation of psychophysical experiment

	[9] Basics of the human brain [10] Basics of the visual cortex [11] Basics of neural signal acquisition: invasive method [12] Basics of neural signal acquisition: non-invasive method [13] Basics of neural information encoding and decoding [14] Overview of recent topics about visual information representation in the neural systems [15] Student presentation about recent topics in visual information representation in the neural systems
Course content utilizing practical experience	
Preparation and review outside class	None, but maybe preferable to get used to computer programming using matlab and/or python
Evaluation and grading	Report(s) will be requirements on the topics mentioned above. Presentation(s) will be evaluated if they are assigned in the course.
Office hours	14:40 - 16:10, every Thursday. An e-mail contact prior to your visit is preferable.
Message for students	Active contribution for the course will enhance your understanding. Explore the attractiveness of this field by yourself, too.
Others	None
Keyword(s)	human brain, neural information processing, brain activity measurement, neuroscience, visual perception, visual illusion, computer graphics, visual psychophysics

International Communication for Science and Technology

General Information

Course title (Japanese)	国際科学技術コミュニケーション論		
Course title (English)	International Communication for Science and Technology		
Course Code			
Academic year	2020	Year offered	All years
Semester(s) offered	Fall semester	Faculty offering the course	Master's Program
Teaching method	Lecture	Credits	2
Category	Graduate school practical education subjects		
Cluster/Department	Offered for all departments		
Lecturer(s)	MATSUURA Motoharu (松浦 基晴), ISHIBASHI Koichiro (石橋 孝一郎)		
Office	East 3-1027		
e-mail	m.matsuura@uec.ac.jp (Matsuura 松浦)		
Course website	NIL		
Last updated	2020/09/04 23:03:34	Update status	Released

Course Description

Topic and goals	<p>< Topic ></p> <p>In the age when sciences and technologies are deeply involved in social life, engineers and researchers need not only the ability to make presentations and negotiations in their specialized fields, but also various communication skills. In addition, in order to achieve the SDGs (Sustainable Development Goals) adopted by the United Nations, it is necessary to show leadership and work with experts from different fields and/or people from different cultures. Moreover, as sciences and technologies tend to become deeper and more complex, it is important to have the ability to explain to general public so that they can properly understand their expertise.</p> <p>In this course, students will understand the international activities such as international standardization, international conferences, international projects, press releases, etc., and acquire the communication skills required in those situations, through lectures and presentations.</p> <p>< Goals ></p> <p>1) Understand the standardization system of science and technology that contributes to SDGs, the academic society system, the international joint research activities, and the form of press release on science and technology.</p> <p>2) Understand international customs and different cultures of activities at international organizations and conferences.</p> <p>3) Acquire the writing and presentation skills necessary for explanations to engineers in different fields and general public by picking up science and technology articles.</p>
Prerequisites	NIL
Recommended prerequisites and preparation	Undergraduate and graduate school English related subject
Course textbooks and materials	<p>Reference materials:</p> <ul style="list-style-type: none"> - エリン・メイヤー著?樋口武志訳「異文化理解力」, 英治出版, 1,800 円 - 情報通信技術委員会編「使える会議英語～国際会議参加者の表現・事例集」, http://www.ttc.or.jp/jp/stdtext/english/ - 山本佳世子著「研究費が増やせるメディア活用術」, 丸善出版, 1,950 円 - Business,” Public Affairs Books, New York City, 2014.
Course outline and weekly schedule	<p>This course is <English Type II>; All lectures will be given mainly in English.</p> <p>#1 Oct. 9 (Fri), 5th period “Introduction, and about SDGs” Prof. Motoharu Matsuura and Mr. Takeshi Tomino (BHN)</p>

	<p>#2 Oct. 16 (Fri), 5th period “International communication for science and technology contributing to SDGs” Emer. Prof. Tetsuya Miki</p> <p>#3 Oct. 23 (Fri), 5th period “International standardization system and Japanese efforts” Ms. Kaori Higashitani (Ministry of Economy, Trade and Industry)</p> <p>#4 Oct. 30 (Fri), 5th period “International standardization in the field of radio communications” Dr. Hiroyuki Atarashi (NTT Docomo)</p> <p>#5 Nov. 6 (Fri), 5th period “International standardization in the field of networks” Dr. Hiromi Ueda (Emer. Prof. of Tokyo Univ. of Technology)</p> <p>#6 Nov. 13 (Fri), 5th period “International standardization and intellectual property” Mr. Tetsuo Kobayashi (Patent Lawyer)</p> <p>#7 Nov. 27 (Fri), 5th period “OECD's commitment to science and technology” Ms. Yoshiko Kurisaki (Europe-Japan Dynamics)</p> <p>#8 Dec. 4 (Fri), 5th period “International R&D Project Activities” Lecturer: Dr. Satoshi Iguchi (National Astronomical Observatory of Japan)</p> <p>#9 Dec. 11 (Fri), 5th period “Presentation at international academic conferences and paper submission to academic journal” Prof. Motoharu Matsuura</p> <p>#10, #11 Dec. 18 (Fri), 5th and 6th period “Exercise 1: Presentation and discussion on the R&D contributing to SDGs” Prof. Matsuura, Prof. Ishibashi, Mr. Kurematsu and Prof. Miki</p> <p>#12 Jan. 8 (Fri), 5th period “Science and technology communication: Media and reporter activities” Ms. Kayoko Yamamoto (The Nikkan Kogyo Shinbun)</p> <p>#13 Jan. 22 (Fri), 5th period “Text expressing the attractiveness of research results” Ms. Kayoko Yamamoto (The Nikkan Kogyo Shinbun)</p> <p>#14, #15 Jan. 29 (Fri), 5th period “Exercise 2: Presentation and discussion on scientific and technology communication” Ms. Yamamoto Prof. Matsuura, Prof. Ishibashi and Prof. Miki</p>
Course content utilizing practical experience	The faculty members for this course have made practical results in joint research regarding ICT. In addition, lecturers from outside are experienced in practical work for long time on topics in charge. Since this course is provided in an omnibus format by these members, it includes very practical contents.
Preparation and review outside class	Read the lecture materials provided in advance so that you can ask questions during class.
Evaluation and grading	<p>< Evaluation method > The contents of the presentations and discussions at the exercise and the reports on the final assignments will be evaluated comprehensively.</p> <p>< Evaluation criteria > The level of understanding of learning goals 1) and 2), and the presentation ability of goal 3) based on the following evaluation criteria; A (80-100 points): It is recognized that goals 1) and 2) are sufficiently achieved, and goal 3) is excellent. B (70-79 points): It is recognized most of goals 1) and 2) are achieved, and goal 3) is good. C (60-69 points): It is recognized most of goals 1) and 2) are achieved fairly, and goal 3) is not sufficient but acceptable. D (59 points or less, rejected): Goals 1) and 2) are not fully achieved and goal 3) is not acceptable.</p>
Office hours	Make appointments by email in advance m.matsuura@uec.ac.jp (Matsuura 松浦)

Message for students	If the situation of COVID-19 improves, a technical tour will be held.
Others	NIL
Keyword(s)	SDGs, information and communications, international standardization, international R&D project, academic presentation, academic journal paper, different culture, science and technology communication

Topics in Mechanical and Intelligent Systems Engineering I (Advanced Robotics and Mechatronics Engineering)

General Information

Course title (Japanese)	Topics in Mechanical and Intelligent Systems Engineering I (Advanced Robotics and Mechatronics Engineering)		
Course title (English)	Topics in Mechanical and Intelligent Systems Engineering I (Advanced Robotics and Mechatronics Engineering)		
Course Code			
Academic year	2020	Year offered	All years
Semester(s) offered	Spring semester	Faculty offering the course	Master's Program, Doctoral Program
Teaching method	Lecture	Credits	2
Category	Graduate school core education subjects - Core subjectsII		
Cluster/Department	Department of Mechanical and Intelligent Systems Engineering		
Lecturer(s)	AOYAMA Hisayuki (青山 尚之), MING Aiguo (明 愛国), YOKOI Hiroshi (横井 浩史), JIANG Yinlai (姜 銀来), KANAMORI Chisato (金森 哉吏), KAN Tetsuo (菅 哲朗), KOIZUMI Norihiro (小泉 憲裕)		
Office	East 4-304		
e-mail	aoyama@mce.uec.ac.jp		
Course website	http://www.joint-robomech.uec.ac.jp		
Last updated	2020/02/27 16:12:00	Update status	Released

Course Description

Topic and goals	As far as Advanced Robotics and Mechatronics are concerned that it is a cutting-edge of technologies to deal with the design, fabrication, operation, structural disposition, production and application for human society, industry and medical field. Robotics and Mechatronics are very exciting area of the computer-controlled technology with such as intelligent property as well as mechanical and electrical elements. Also robotic and mechatronics are related to the science of electronics, mechanics and computer software engineering. Generally this course for the Joint Program can provide several issues of advanced robotics and mechatronics with the intensive style. In today's life, the importance of robotics and mechatronics for various practical applications are improving not only in industrial life but also other spheres such as human life. So the interesting scopes are set up for the candidates that would complete this international joint program.
Prerequisites	Mechanical and Electrical Engineering, Control Engineering, Robotics Engineering
Recommended prerequisites and preparation	Mechanical and Electrical Engineering, Control Engineering, Robotics Engineering
Course textbooks and materials	Fundamental Robotics and Applications
Course outline and weekly schedule	<p>[1]Introduction to Advanced Robotics and Mechatronics :The latest topics that are related with Robotics and Mechatronics are introduced so that the overview of these technologies can be recognized.</p> <p>[2]Intelligent Mechatronics(I)(II) : The fundamental topics with Intelligent Mechatronics are given and such the typical structure and the function are discussed. As the application of Intelligent Mechatronics, the self-locomotionin-door system and the home service robot are discussed.</p> <p>[3] Micro Electronics Mechanical System(I)(II):The fundamental topics with Micro Electro Mechanical Systems are given and the fabrication process for MEMS is discussed.As the application of MEMS, micro sensors/devices and applications are discussed.</p> <p>[4] Medical Robotics(I)(II): The fundamental topics with Medical Robotics are given and such the typical function and the unique structure are discussed.As the application of Medical Robotics, the diagnostic technique with ultrasound imaging for motion control is discussed.</p> <p>[5]Brain Science for Robotics(I)(II):The fundamental topics for image processing in brain for</p>

	<p>robot motion control is discussed. As the application of Brain Science for Robotics, several latest technologies for human life support and health care monitor are discussed.</p> <p>[6] Mechatronics for Artificial Arm and Intelligent Control(I)(II): The fundamental topics for control the artificial arm mechanism and the signal processing as well as image processing are discussed. As the application of Mechatronics for Artificial Arm and Intelligent Control, several practical arm robots and control schemes are discussed for improving the quality of human life.</p> <p>[7] Bio-Robotics and Mechatronics(I)(II): The fundamental topics of the mechanical dynamics and biomimetics that can give the sense of new technologies inspired by biological solutions. As the application of bio-robotics and mechatronics, such a jumping mechanism and a fish swimming robots are discussed.</p>
Course content utilizing practical experience	
Preparation and review outside class	<p>Before course work, it is required to check the background of the topics by such the internet. After course works, some homeworks should be given to improve the knowledge about the topics.</p>
Evaluation and grading	<p>(Assessment Policy)</p> <p>There will be some report requirements on the topics mentioned above during the semester. And the practical mechatronics development will be given to improve the mechatronics sense. Assessment in this class will take account of (1) these reports, (2) attendance-rate and (3) the prototype development with the score proportion of 30%, 30% and 40%, respectively.</p>
Office hours	Monday 16:00-17:00 at UEC.
Message for students	This course is provided for the international jointly offered graduate program. The students who join this program have to get one course at UEC and another course at the counterpart overseas university.
Others	This course work is associated with UEC International Jointly Offered Graduate Program with several overseas universities. The students who join this program should get this course subject and another counterpart course work that is given at the host universities.
Keyword(s)	Robotics, Mechatronics, Electronics, Signal Processing, Micro System, Medical Engineering, Brain Science, Biomimetics, Robot Navigation, MEMS