Course Description

UEC Exchange program

Japanese University Studies in Science and Technology (JUSST)

Fall Semester, 2019

Center for International Programs and Exchange

The University of Electro-Communications

国立大学法人
電気通信大学
UEC TOKYO

100th ANNIVERSARY SINCE 1918

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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JUSST Program Course Requirements

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<tr><th></th><th>Subject</th><th>1st Semester</th><th>2nd Semester</th></tr>
<tr><td rowspan="7">CORE SUBJECTS</td><td rowspan="2">LAB WORK
Research / Project
(Required for JUSST student)</td><td colspan="2">[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)</td></tr>
<tr><td colspan="2">[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)</td></tr>
<tr><td>Academic Skills I</td><td rowspan="2">2 hours/week (2 Credits)</td><td rowspan="2">–</td></tr>
<tr><td>Academic Skills II</td></tr>
<tr><td>Academic Skills III</td><td>–</td><td>2 hours/week (2 Credits)</td></tr>
<tr><td>Japanese Language</td><td colspan="2">Elementary / Intermediate / Advanced *
12 - 14 hours/week (6 - 7 Credits)</td></tr>
<tr><td rowspan="3">Science and Engineering Subjects
(ELECTIVE)</td><td colspan="2">[UNDERGRADUATE STUDENTS]
Need to pass <u>3 subjects</u> at minimum **
in Each Semester</td></tr>
<tr><td colspan="2">[GRADUATE STUDENTS]
Need to pass <u>3 subjects</u> at minimum **
in One Academic Year</td></tr>
<tr><td colspan="2">Electronic Experiment Lab.
4 hours/week (2 Credits)
Required for all Undergraduate Students
Only offered in the FALL Semester</td></tr>
<tr><td rowspan="4">FREE ELECTIVE</td><td>Preparation for Overseas Study
English for Intercultural Communication</td><td colspan="2">2 hours/week (2 Credits)
Offered in the SPRING Semester only</td></tr>
<tr><td>Advanced Reading in Academic English
Research Writing</td><td colspan="2">2 hours/week (2 Credits)
Offered in the FALL Semester only</td></tr>
<tr><td>Sports Classes</td><td>–</td><td>2 hours/week (1 Credit)</td></tr>
</table>

*) 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.

2019 FALL SEMESTER CALENDAR

	SUN	MON	TUE	WED	THU	FRI	SAT	SUN	MON	TUE	WED	THU	FRI	SAT	SUN	MON	TUE	WED	THU	FRI	SAT	SUN	MON	TUE	WED	THU	FRI	SAT	SUN	MON	TUE	WED	THU	FRI	SAT	SUN	MON
OCT			1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31					
			New Students Arrival	2th to 4th Orientation Week					Classes Begin Opening Ceremony							Health & Sports Day Classes as Usual		16th to 23th Course registration period						The Core Enthronement Ceremony								Welcome Party 18:00 - 19:15					
NOV						1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30			
						Medical Checkup (Junior Student only)		Culture Day	Make-up Holiday																21st - 25th No Classes University Festival (open campus day)												
DEC	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31						
																								24th Dec to 4th Jan Winter Break													
JAN				1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31			
				New Year's Day	Winter Break				Classes Resume							Coming-of-Age Day																						
FEB							1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28			
										4th to 6th Make-up Class Period						National Foundation Day	12th to 19th Examination Period								Preparing for The mini-Conference (Presentation)											
MAR	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31						
	JUSST mini-Conference and Closing Ceremony Every JUSST student have to attend (to be announced)														11th Mar to 31st Mar Spring Break for the regular student (no class day)					Spring Equinox Day				JUSST Completer Vacate Deadline											
APR				1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30					
				2nd semester Class Guidance All students have to attend																												Showa Day						

National holiday

University center exam and UEC entrance exams

@ JUSST students Weekly Meeting

Every _____ (start from _____ in E2-B117)

Time-Table for Fall Semester, 2019
令和元年度秋学期（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）	C-401	Old C building
	3					
	4					
	5					
Tue 火	1	UEC Academic Skills I (Computer Literacy)	CIPE		C-401	Old C building
	2	UEC Academic Skills II (Information literacy and Research)	CIPE	CHOO	C-401	
		Life　Long　Learning　Sports (for Senior student only)	SPORTS	ANDO Soichi (安藤　創一)		For 2nd semester students only
	3	Japanese Language (日本語)	CIPE			
	4	Japanese Language (日本語)	CIPE			
	5					
Wed 水	1					
	2	Japanese Language (日本語)	CIPE			
	3	Japanese Language (日本語)	CIPE			
	4	Japanese Language (日本語)	CIPE			
		Advanced Reading in Academic English	HLSS	Atsuko Marie JEFFREYS	C-402	Old C building
	5					
Thu 木	1	UEC Academic Skills III (Publishing Literacy and Research)	CIPE	CHOO	E3-1st floor	Computer Room
	2	Advanced Communication Engineering and Informatics III (Computational Complexity)	I	TARUI Jun (垂井　淳)	C-301	Old C building
	3	Advanced Communication Engineering and Informatics IV (Computer Algorithms)	I	KOBAYASHI Satoshi (小林　聡)	W9-116	
	3	Experimental Electronics Laboratory	S	KISHIMOTO Tetsuo (岸本　哲夫) VOHRA Varun	W8-318	Compulsory subject for Undergraduates
	4					
	5	Topics in Mechanical and Intelligent Systems Engineering II (The Human Brain as Intelligent Machines)	M	MIYAWAKI Yoichi (宮脇　陽一)	E4-222	
Fri 金	1	Japanese Language (日本語)	CIPE			
	2	Japanese Language (日本語)	CIPE			
	3					
	4					
	5	Information and Communications Technologies for SDGs	J I	NISHINO Tetsuro（西野 哲朗） MATSUURA Motoharu (松浦 基晴)	E3-301	Class #12 will be held at W10-233
		Research Writing	HLSS	Eric Hauser	A-301	
Intensive Course		Topics in Mechanical and Intelligent Systems Engineering I (Advanced Robotics and Mechatronics Engineering)	M	AOYAMA Hisayuki (青山　尚之), et al.	See page 24 for the classroom and schedule	

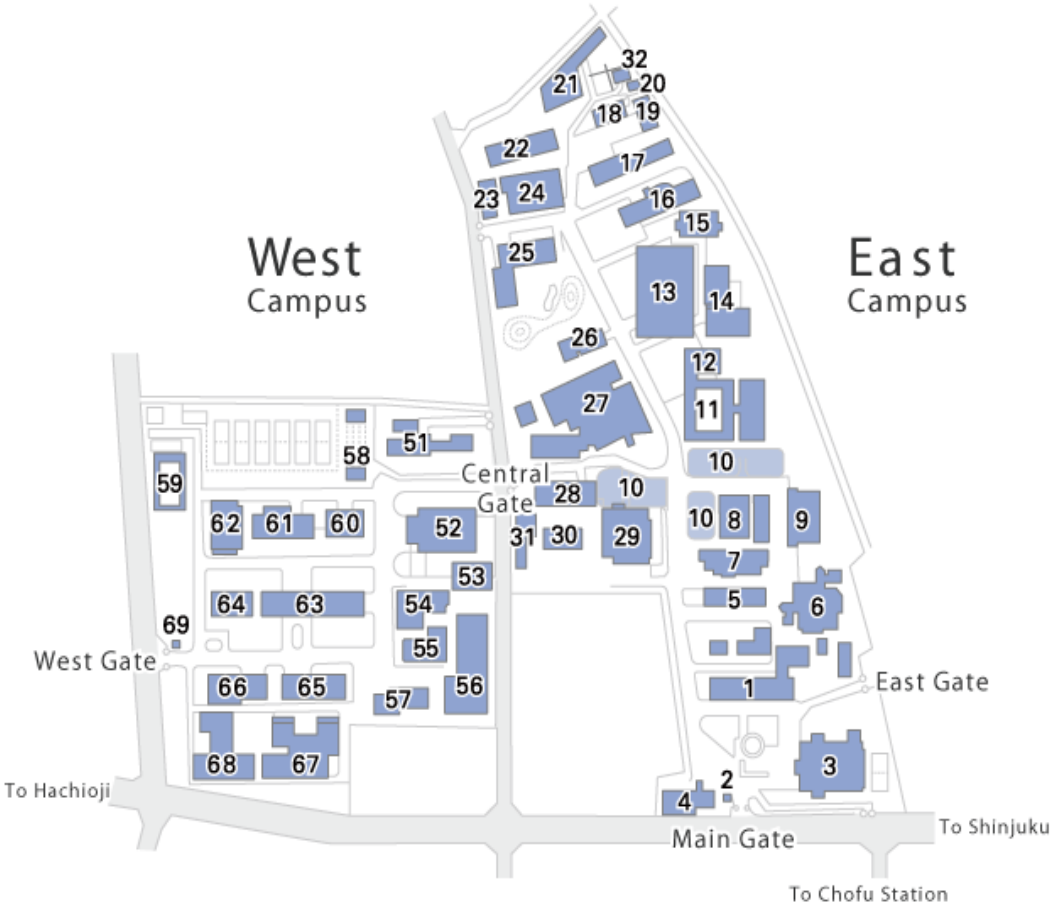
Department 学科等

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

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

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）

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	2019	**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	2019/07/08 17:09:29	**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	Course schedule and topics that will be covered ========== 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 (Forms, Tables, and Frames) 15. HTML (Interactivity, Cascading Style Sheet; CSS) ========== This course is intended to be a lecture in combination with a practical exercise ("learn, practice, implement and apply") that will cover the usage of the UNIX system, and including how to write in LaTeX and HTML. 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	Evaluation is given as follows; (Tasks 50%, Mid-Semester presentation 30%, Final presentation 20%) 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.
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

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	2019	**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	2019/07/08 17:10:27	**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	Course schedule and topics that will be covered ========== 1. Introduction (Usage: The Information Technology Center etc.) 2. Academic Integrity (Referencing, citing) 3. Mind mapping, brain storming 4. Scientific literatures and resources retrieval 1/2 5. Scientific literatures and resources retrieval 2/2 (UEC Library) 6. Managing resources 7. Managing, accessing and sharing resources, and Create bibliographies 8. Logical and Critical reading (comprehend, examine, evidence, utilize) 9. Graphical information (Inkscape, GIMP) 10. Tables, Graphs, Charts, Diagrams and Timelines (SciDAVis) 11. Formula editor (word processing and computation) 12. Desktop publishing for poster presentation (Scribus) 13. Preparation for presentation 14. Poster presentation 1/2 15. Poster presentation 2/2 ========== The course gives an introduction to the use of some powerful tools for scientific research and engineering, and the lectures include hands-on learning and applicable exercises. Note that the lecture schedule is subject to constant revisions throughout the course.
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	Evaluation is given as follows; (Assignments 50%, midterm presentation 20%, Poster presentation 30%) 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.
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	2019	**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-as3@fedu.uec.ac.jp		
Course website	http://www.fedu.uec.ac.jp/skills		
Last updated	2019/07/08 17:10:40	**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 コンピューターリテラシー
Recommended prerequisites and preparation	UEC Academic Skills II (Information Literacy and Research)
Course textbooks and materials	NIL
Course outline and weekly schedule	Course schedule and topics that will be covered ========== 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 and brainstorming etc.) 5. Proposing and Reporting on Research 6. Making a 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 ========== This course is designed to support the pursuit of writing research paper and share the skills of quality publishing. The lectures are linked with practical activities, and the final assignment requires that each student to publishing and presenting a research paper/article in a mock conference (in class for regular student). Note that the lecture schedule is subject to constant revisions throughout the course.
Course content utilizing practical experience	

Preparation and review outside class	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 make an oral presentation. 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.
Evaluation and grading	Evaluation is given as follows; (Assignments 40%, Writing paper 30%, Oral presentation 30%) 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.
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

Advanced Reading in Academic English

General Information

Course title (Japanese)	Advanced Reading in Academic English		
Course title (English)	Advanced Reading in Academic English		
Course Code	ENG602z		
Academic year	2019	**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)	Atsuko M Jeffreys		
Office	East 1-807		
e-mail	ajeffreys@uec.ac.jp		
Course website	https://www.edmodo.com/, http://science.sciencemag.org/		
Last updated	2019/03/30 10:57:10	**Update status**	Released

Course Description

Topic and goals	The goal of this course is to be able to correctly interpret texts written by native speakers of English for native speakers of English, by reading them closely and studying the grammar, vocabulary and expressions, and the structures, Specifically, we will use articles in the Science Magazine online.
Prerequisites	The following courses are prerequisites to registering for this class: Academic Spoken English I and II Academic Written English I and II Academic English for the Second Year I and II
Recommended prerequisites and preparation	Any science courses
Course textbooks and materials	An article will be chosen from the Science Magazine online (http://science.sciencemag.org/). No purchase of textbooks is necessary.
Course outline and weekly schedule	In each class, a pair of students will explain the article of their choice in lecture style, based on the class contents the previous week. It is expected that the other students react by asking questions and making comments. Class 1: Introduction of class / preparation for next class Classes 2 - 7: Grammatical study of articles / Student lectures Class 8: Midterm test Classes 9 - 14: Grammatical study of articles / Student lectures Class 15: Final test
Course content utilizing practical experience	
Preparation and review outside class	1. Read the article for next week, study the grammar, vocabulary and expressions, and the structure. 2. Prepare to react to the lecture. 2. Review your learning after class.

Evaluation and grading	Class lectures 25% Reaction to lectures 25% Midterm test 25% Final test 25% ---------- Total 100% Distinction≧90%, Excellent≧80%, Good≧70%, Fair≧60%, Failed <60%
Office hours	Friday 3rd period, and other times by appointment. Email is always welcome.
Message for students	・What does not kill you makes you stronger. -- This is true.
Others	The contents of this syllabus are subject to change as deemed necessary.
Keyword(s)	Autonomous learning, Close reading, Reading comprehension

Research Writing

General Information

Course title (Japanese)	Research Writing		
Course title (English)	Research Writing		
Course Code	ENG601z		
Academic year	2019	**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)	Eric Hauser		
Office			
e-mail			
Course website			
Last updated	2019/02/27 00:29:50	**Update status**	Released

Course Description

Topic and goals	The transition from undergraduate to graduate study presents many challenges and requires careful preparation in many aspects and substantial effort. This course is designed to help undergraduate students make the difficult transition and gain the basic knowledge and the necessary competencies of what will be required of them at graduate school particularly in the respects of English language and other language-related academic skills. Students in this course will familiarize themselves with the common academic activities/tasks such as group discussion, critical reading and analysis of textbooks and academic articles, informal oral and written report, formal presentation at symposiums and conferences (poster and computer-aided), and basic academic paper writing. This course will also support students in areas of how to communicate with professors and international students orally and through emailing. At the end of the course, students will conduct a field research to survey and interview UEC graduate students and professors on how to succeed in graduate school.
Prerequisites	1st and 2nd year compulsory English courses of UEC
Recommended prerequisites and preparation	Some Advanced English courses focusing on academic English, presentation and writing
Course textbooks and materials	Teaching materials will be prepared by the teacher and students based on the needs of the syllabus.
Course outline and weekly schedule	Week 1: Guidance/Course Orientation Week 2: What is academic English? What kinds of English are needed in your future labs? Week 3: Journal articles and reporting them bilingually Week 4: Research and types of academic writing Week 5: PPT writing Week 6: PPT writing Week 7: Poster writing Week 8: Poster writing Week 9: Definition wriing Week 10: Manual writing Week 11: Manual writing Week 12: Academic abstract writing Week 13: Academic abstract writing Week 14: Academic journal writing Week 15: Academic journal writing (Week 16: Self-evaluation and course evaluation)
Course content utilizing practical experience	
Preparation and review outside class	Group work or research for presentations may take up a lot of time outside of the classes.

Evaluation and grading	Performance and attitude in class: 20% PPT writing: 20% Poster writing: 20% Abstract writing: 20% Definition writing: 10% Manual writing: 10%
Office hours	Based on appointment by email or Tue 3.
Message for students	Never allow English to ride on you; you should ride on it (A Chinese proverb). Logic, logic, logic!
Others	Students interested in independent learning and corpus-analysis of English for Science and Technology are specially welcome.
Keyword(s)	graduate school, academic English, presentation, abstract, journal article, research

Topics in Informatics I (Evolutionary Computation)

General Information

Course title (Japanese)	Topics in Informatics I (Evolutionary Computation)		
Course title (English)	Topics in Informatics I (Evolutionary Computation)		
Course Code	INT004a INT004b INT004e		
Academic year	2019	**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)	SATO Hiroyuki (佐藤 寛之)		
Office	West 6-205		
e-mail	h.sato@uec.ac.jp		
Course website	N/A		
Last updated	2019/07/02 09:53:04	**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	The lecturer distributes materials.
Course outline and weekly schedule	1. Introduction to Evolutionary Computation 2. Classic Evolutionary Algorithms: Genetic Algorithm, Evolutionary Strategy, etc. 3. Optimization Problems (Part 1): Combinatorial Problems, Continuous Problems 4. Optimization Problems (Part 2): Constrained Problems, Multi-Objective Problems 5. Optimization Problems (Part 3): Noisy, Dynamic, and Expensive Problems 6. Recent Evolutionary Algorithms (Part 1): Differential Evolution, Particle Swarm Optimization, etc. 7. Recent Evolutionary Algorithms (Part 2): Other Algorithms 8. Computer Exercise of Evolutionary Single Objective Optimization (1) 9. Computer Exercise of Evolutionary Single Objective Optimization (2) 10. Presentations and Discussions about Evolutionary Single Objective Optimization

	11. Evolutionary Multi-Objective Optimization and Decision Making Support 12. Evolutionary Many-Objective Optimization 13. Computer Exercise of Evolutionary Multi-Objective Optimization 14. Presentations and Discussions about 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 should be needed after the weekly class. Since computer exercises involve programming, developing environment needs to be prepared on own computer.
Evaluation and grading	Students are required to submit reports. The reports are scored, and the evaluation is decided by the followings (100 points maximum). S: >= 90 points A: >= 80 points B: >= 70 points C: >= 60 points D: <60 points
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 （Computational Complexity）		
Course title (English)	Advanced Communication Engineering and Informatics III （Computational Complexity）		
Course Code	INT003c INT003d INT003f INT003g		
Academic year	2019	**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	juntarui@uec.ac.jp		
Course website	www.jtlab.ice.uec.ac.jp		
Last updated	2019/03/04 15:33:53	**Update status**	Released

Course Description

Topic and goals	In the academic year of 2019, 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	In the first half of the course, we will discuss the following various algorithmic paradigms: (1) learning algorithms (2) randomized algorithms (3) approximation algorithms In the second half, we will discuss the following: (1) complexity classes including important classes P and NP (2) theory of NP-completeness (3) theoretical cryptography 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. 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）		
Course title (English)	Advanced Communication Engineering and Informatics IV（Computer Algorithms）		
Course Code	INT004c INT004d INT004f INT004g		
Academic year	2019	**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	2019/02/22 13:07:05	**Update status**	Released

Course Description

Topic and goals	The purpose of this lecture is provide the theory and technique to design efficient algorithms for various fundamental problems. The goals of the students are to achieve the following points: (1) to understand the behavior, correctness, and time complexity analysis of the algorithms discussed in the lecture, (2) to understand the principles of design methodologies of algorithms, such as dynamic programming, greedy method, etc.
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	(a) Contents of the lecture [1] Minimum spanning tree problem and greedy algorithms [2] Correctness of Prim's and Kruskal's algorithm [3] Greedy algorithms for other problems [4] Shortest path problem and Dynamic Programming (DP) [5] DP Method (1) --- Transform DFAs to regular expressions [6] DP Method (2) --- Context-free grammar and its recognition problem [7] DP Method (3) --- CYK algorithm for CFG recognition [8] DP Method (4) --- Hidden Markov Models (HMM) [9] DP Method (5) --- Recognition problem of HMM [10] DP Method (6) --- HMM recognition algorithm

	[11] DP Method (7) --- Approximate string matching algorithms [12] String matching problem [13] Computing failure functions in KMP algorithm [14] Correctness and time complecity of KMP algorithm [15] Summary and conclusion of this lecture (b) How does this lecture proceed? 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		
Course title (English)	Experimental Electronics Laboratory		
Course Code	INT401k INT401m INT401n INT401p		
Academic year	2019	**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	2019/02/22 11:02:06	**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	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. 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	Please make an appointment before coming to my office. Contact: Bldg-E6, room 628 Ext:5449 kishi(at)pc.uec.ac.jp
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）		
Course title (English)	Topics in Mechanical and Intelligent Systems Engineering II		
Academic year	2019	**Year offered**	3/4
Semester(s) offered	Fall semester	**Faculty offering the course**	Faculty of Informatics and Engineering
Teaching method	Lecture	**Credits**	2
Category	Core subjects		
Cluster/Department	Department of Mechanical Engineering and Intelligent Systems		
Lecturer(s)	MIYAWAKI Yoichi (宮脇　陽一)		
Office	E4-620		
e-mail	yoichi.miyawaki@uec.ac.jp		
Course website	None		
Last updated	2019/10/03 21:01:49	**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 electroenchephalography (EEG), magnetoenchephalography (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] Peter Dayan and Laurence F. Abbott, "Theoretical Neuroscience: Computational and Mathematical Modeling of Neural Systems," The MIT Press (2005) [2] 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

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	Please make an appointment by using E-mail prior to your visit
Message for students	Active contribution for the course would enhance your understanding. Please 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

Information and Communications Technologies for SDGs

General Information

Course title (Japanese)	SDGs を支える情報通信論（BHN 寄付講座）		
Course title (English)	Information and Communications Technologies for SDGs (BHN donation course)		
Course Code			
Academic year	2019	**Year offered**	All years
Semester(s) offered	Spring semester	**Faculty offering the course**	Graduate School of Informatics and Engineering
Teaching method	Lecture and Tours	**Credits**	2
Category	Practical education subjects		
Cluster/Department			
Lecturer(s)	Tetsuro Nishino (西野 哲朗), Motoharu Matsuura (松浦 基晴)		
Office	East 3-826, East 3-1027		
e-mail	nishino@uec.ac.jp, m.matsuura@uec.ac.jp		
Course website			
Last updated		**Update status**	

Course Description

Topic and goals	**Topics:** SDGs (Sustainable Development Goals), which is the international goal of the "2030 Agenda for Sustainable Development" adopted at the United Nations summit in Sep 2015, is a universal concern not only indeveloping countries but also in developed countries, and Japan is actively engaged in various ranges of fields. In this course, students will understand the SDGs, and deepen their understanding of the functions and policies of "Information and communications technology" (ICT), energy and information security that are important for the formation of the sustainable society. In addition, students will learn the 17 goals related to the SDGs, particularly the expected areas where ICT contributes greatly. Through the technical tours, students will gain a concrete understanding of the ICT that support the SDGs. **Goals:** #1 Understand the establishment of the SDGs, the importance of ICT functions and policies, the key issues, i.e. energy and information security in achieving SDGs. #2 Learn from case studies regarding the contribution of ICT in realizing SDGs, and deepen the understanding of the major issues. #3 Cultivating engineers' readiness and foresight toward the realization of SDGs.
Prerequisites	
Recommended prerequisites and preparation	
Course textbooks and materials	
Course outline and weekly schedule	**[Lecture]** **Lecture #1** 4th (Fri) Oct, 5th period, Classroom: E3-301 “Introduction, BHN activities and SDGs” Prof. NISHINO Tetsuro, Lecturer TOMINO Takeshi, BHN **Lecture #2** 11th (Fri) Oct, 5th period, Classroom: E3-301 “The ICT function towards the realization of SDGs” Lecturer KANO Sadahiko (Emer. Prof. of Waseda University) **Lecture #3** 18th (Fri) Oct, 5th period, Classroom: E3-301 “Energy the key issues to achieving the SDGs” Emer. Prof. ICHIKAWA Haruhisa **Lecture #4** 25th (Fri) Oct, 5th period, Classroom: E3-301 “ICT policy for realizing SDGs” Lecturer SAKAMOTO Yasuo (NTT Docomo) **Lecture #5** 1st (Fri) Nov, 5th period, Classroom: E3-301 “ICT the key issues to achieving the SDGs” Lecurer HARADA Yonosuke (Emer. Prof. of Institute of Information Security) **Lecture #6** 8th (Fri) Nov, 5th period, Classroom: E3-301 “The application of ICT for achieving SDGs: Medical field” Lecturer KUREMATSU Hachihei (BHN) **Lecture #7** 15th (Fri) Nov, 5th period, Classroom: E3-301 “The application of ICT for achieving SDGs: Welfare area” Prof. YOKOI Hiroshi **Lecture #8** 29th (Fri) Nov, 5th period, Classroom: E3-301 “The application of ICT for achieving SDGs: Regional revitalization” Lecturer KOBAYASHI Tadao (IEEE802.11ah Promotion

	Council, President) **Lecture #9-10** 30th (Sat) Nov or 7th (Sat) Dec Technical Tour: See below for the details **Lecture #11** 6th (Fri) Dec, 5th period, Classroom: E3-301 “The application of ICT for achieving SDGs: Disaster prevention and Mitigation” Lecture, ARIMA Shuji (BHN) **Lecture #12** 13th (Fri) Dec, 5th period, Classroom: W10-233 “The application of ICT for achieving SDGs: Global environment” Lecturer NAKAMURA Kenji (Prof. of Dokkyo University) **Lecture #13** 20th (Fri) Dec, 5th period, Classroom: E3-301 “The application of ICT for achieving SDGs: Agriculture and fishery Area” Prof. ISHIBASHI Koichiro **Lecture #14-15** 10th (Fri) Jan, 5th - 6th period, Classroom: E3-301 Presentation: See below for the details **[Technical Tour]** **A course: 30th (Sat) Nov, one-day bus tour** 1. Tohto University-Makuhari campus (Chiba City): Training site inspection for human resources (physical therapists) supporting medical, health, preventive, and welfare services 2. National Research Institute for Earth Science and Disaster Resilience (Tsukuba City): Visits to study on the fundamental research and development for real-time disaster observation and prediction technology, improvement of resilience of social infrastructure, reduction of disaster risk, etc. 3. Kashiwanoha Smart City (Kashiwa City): Study on the Public-Private-Academic collaborations to construct a social infrastructure for the creation of new industries, such as environment and energy, food and health. **B course: 7th (Sat) Dec, one-day bus tour (Yamanashi prefecture: Kofu City, Chuo City, Koshu City)** 1. Yamanashi IoT lab (Kofu City): Study on the IoT applications in manufacturing, agriculture, and tourism in Yamanashi (AI robot application development, Agri-Innovation Lab, Experience-based tourism cooperative experience system, etc.) 2. Salad Bowl Ltd, NTT East (Chuo City): Case Study of ICT for Agriculture (such as high quality tomato cultivation, harvesting forecast, and machine-learning for grain selection 3. JA Fruit Yamanashi (Koshu City): Site inspection of the cultivation of grapes by skilled farmers in use of IoT technology, environmental monitoring in a vinyl greenhouse, brand improvement measures for Shine Muscat, and efforts to eliminate labor shortages and foster successors. **[Presentation]** Make a presentation of your ideas, plans and/or proposals for solving problems in your hometown (country) using ICT, refering to what you learned in lectures and technical tours
Course content utilizing practical experience	
Preparation and review outside class	
Evaluation and grading	Comprehensively evaluate the presentations and discussions in the exercises, and the reports on the final assignments. Evaluation criteria: Students will be evaluated upon their understanding of learning goal #1, #2, and the readiness for the academic achievement of learning goal #3 according to the following criteria. **Grading criteria:** A (80 - 100 %): Sufficiently understand the learning goals of #1, #2 and It is recognized that the ability to learning goal #3 has been well developed. B (70 - 79 %): Understand most of the learning goals of #1, #2 and it is recognized that the ability to learning goal #3 has been cultivated to some extent. C (60 - 69 %): Almost understood about the learning goals #1, #2 and the ability of learning goal #3 has been raised to a certain extent. D (Below 59 %, Fail): The understanding of 1 and 2 is insufficient, and the ability of learning goal #3 have not been cultivated.
Office hours	
Message for students	There are also many foreign student in this class. So it is also a good change to make foreign friends. I will prepare the handout in both English and Japanese, furthermore, the important part will be explained in both languages, so the students do not need to worry about their English.
Others	Lectures and exercises for students from other universities will be conducted through e-learning.
Keyword(s)	

Advanced Robotics and Mechatronics Engineering

General Information

Course title (Japanese)	Advanced Robotics and Mechatronics Engineering (大学院連携科目)		
Course title (English)	Advanced Robotics and Mechatronics Engineering		
Course Code	MCEb13h MCEb13i MCEb13j		
Academic year	2019	**Year offered**	2019
Semester(s) offered	Fall semester	**Faculty offering the course**	Int'l Joint Program
Teaching method	Lecture(Intensive)	**Credits**	2
Cluster/Department	Department of Mechanical and Intelligent Systems		
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	E4-304, E4-503, E4-601,E4-305,E4-405		
e-mail	aoyama@mce.uec.ac.jp,ming@mce.uec.ac.jp,kanamori@mce.uec.ac.jp, yokoi@mce.uec.ac.jp, tetsuokan@uec.ac.jp, jiang@hi.mce.uec.ac.jp,nkoizumi@uec.ac.jp		
Course website	http://www.joint-robomech.uec.ac.jp		
Last updated	2019/09/17	**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	[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 will be given. [2]Industrial 4.0, IoT and Global Warming for Robotics and Mechtronics Engineering The latest topics such as Industrial 4.0, IoT and Global Warming are discussedand the solution to these problems are given to improve the quality of the life for aged societies. [3]Intelligent Mechatronics(I) The fundamental topics with Intelligent Mechatronics are given and such the typical structure and the function are discussed. [4]Intelligent Mechatronics(II) As the application of Intelligent Mechatronics, the self-locomotion in-door system and the home service robot are discussed. [5] Micro Electronics Mechanical System(I) The fundamental topics with Micro Electro Mechanical Systems are given　and the fabrication process for MEMS is discussed. [6] Micro Electronics Mechanical System(II) As the application of MEMS, micro sensors/devices and applications are discussed. [7] Medical Robotics(I) The fundamental topics with Medical Robotics are given and such the typical function and the unique structure are discussed. [8] Medical Robotics(II)

	As the application of Medical Robotics, the diagnostic technique with ultrasound imaging for motion control is discussed. [9]Brain Science for Robotics(I) The fundamental topics for image processing in brain for robot motion control is discussed. [10]Brain Science for Robotics(II) As the application of Brain Science for Robotics, several latest technologies for human life support and health care monitor are discussed. [11]Mechatronics for Artificial Arm and Intelligent Control(I) The fundamental topics for control the artificial arm mechanism and the signal processing as well as image processing are discussed. [12]Mechatronics for Artificial Arm and Intelligent Control(II) 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. [13] Bio-Robotics and Mechatronics(I) The fundamental topics of the mechanical dynamics and biominietcs that can give the sense of new technologies inspired by biological solutions. [14]Bio-Robotics and Mechatronics(II) As the application of bio-robotics and mechatronics, such a jumping mechanism and a fish swimming robots are discussed. [15]Intelligent Control (Tentative by Guest Professors) [16]Robotics and Mobile Communications for Smart Society (Tentative by Guest Professors)
Preparation and review outside class	Before course work, it is requried 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.
Evaluation and grading	(Assessment Policy) 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.
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 oversea university.
Keyword(s)	Robotics, Mecatronics, Electronics, Signal Processing, Micro System, Medical Engineering, Brain Science, Biomimitics, Robot Navigation, MEMS

Course Schedule **(Classroom E4-315)**

Lecture	Date	Period	Classroom (Tentative)	Professor	Topics
1	18th Nov (Mon)	5th 16:15-17:45	E4-315	Aoyama H.	Introduction to Advanced Robotics and Mechatronics
2	19th Nov (Tue)	5th 16:15-17:45	E4-315	Aoyama H.	Industrial 5.0, IoT and Global Warming for Robotics and Mechtronics Engineering
3, 4	20th Nov (Wed)	5th, 6th 16:15-19:20	E4-315	Kanamori C.	Intelligent Mechatronics (I) & (II)
5, 6	21st Nov (Thu)	5th, 6th 17:50-19:20	E4-315	Kan T.	Micro Electronics Mechanical System (I) & (II)
7, 8	25th Nov (Mon)	5th, 6th 17:50-19:20	E4-315	Koizumi N.	Medical Robotics (I) & (II)
9, 10	26th Nov (Tue)	5th, 6th 17:50-19:20	E4-315	Yokoi K.	Brain Science for Robotics (I) & (II)
11, 12	27th Nov (Wed)	5th, 6th 16:15-19:20	E4-315	Jiang Y.	Mechatronics for Artificial Arm and Intelligent Control (I) & (II)
13, 14	28th Nov (Thu)	5th, 6th 16:15-19:20	E4-315	Ming A.	Bio-Robotics and Mechatronics(I)&(II)
15	2nd Dec (Mon),	5th 16:15-17:45	E4-315	Taworn (KMITL)	Advance control scheme in robotics and intelligent systems
16	10th Dec (Tue)	5th 16:15-17:45	E4-315	Lee (TKU)	Mobile Communications for Smart Society