Course Description

UEC Exchange program

Japanese University Studies in Science and Technology (JUSST)

Spring Semester, 2021

Center for International Programs and Exchange

The University of Electro-Communications

We stay United against thE innovational Challenge

UEC TOKYO 国立大学法人 電気通信大学

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
1-5-1 Chofugaoka, Chofu-shi, 182-8585
Tokyo, Japan
E-mail: jusst@fedu.uec.ac.jp

Contents

JUSST Program Course Requirements

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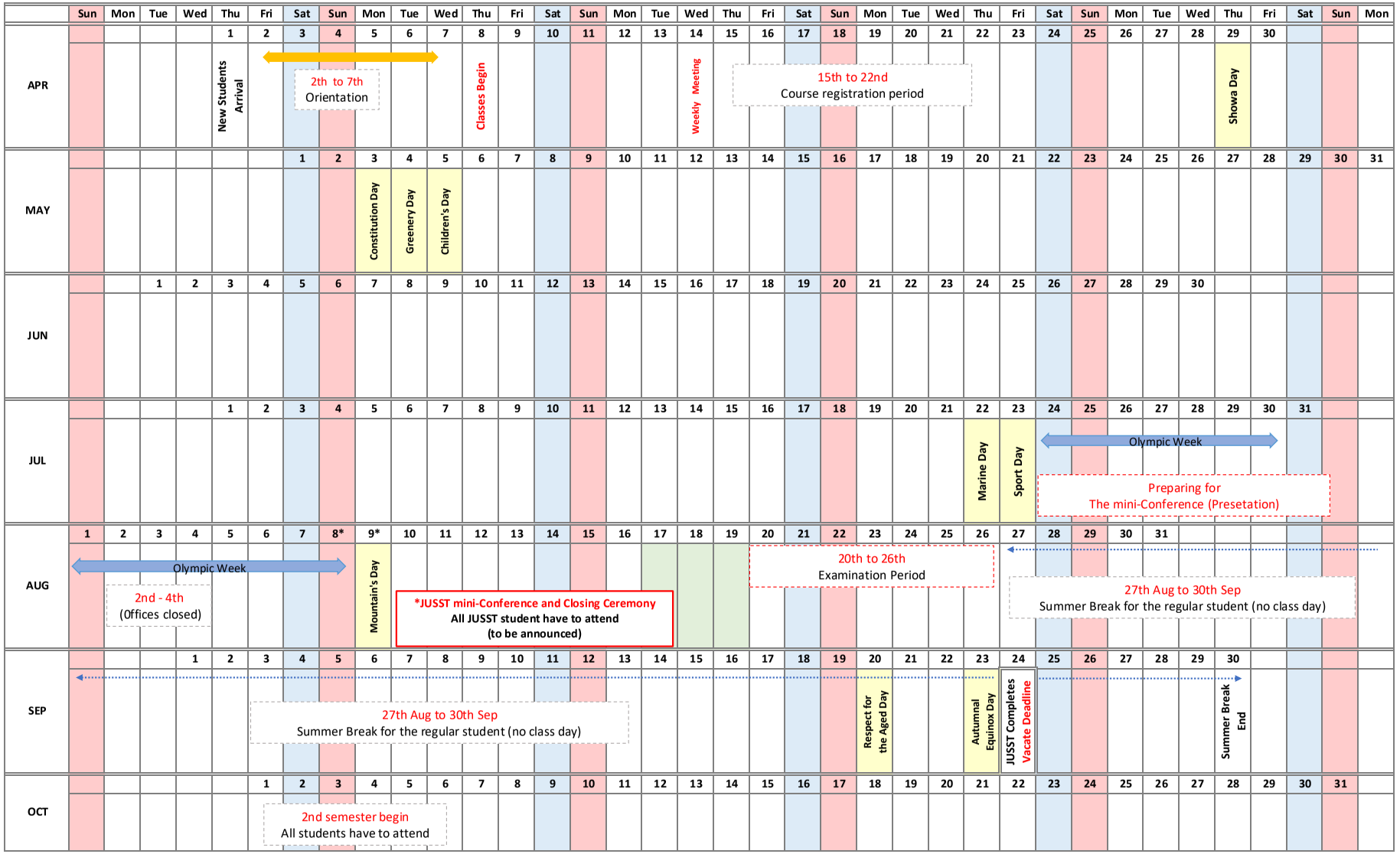
<tr><td rowspan="8">CORE SUBJECTS</td><td rowspan="2">LAB WORK
Research / Project
(Required for JUSST student)</td><td colspan="2">[UNDERGRADUATE STUDENTS]
<u>Individual Study Project</u> under the supervision of UEC faculty member. Minimum 8 hours/week
5 Credits/one academic year (2 Credits/one semester)</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.

2021 SPRING SEMESTER CALENDAR



National holiday

Entrance examination for UEC graduate school

@ JUSST students Weekly Meeting on every Wed (start from 16:30)

Time-Table for Spring Semester, 2021
令和3年度春学期（前期）　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	VLSI Low Power Circuit Design	I	ISHIBASHI Koichiro （石橋 孝一郎）	W2-106	*
	3					
	4					
	5	Advanced Communication Engineering and Informatics II (Optical Communication Engineering)	I	KISHI Naoto (來住 直人)	E6-201	
Tue 火	1	UEC Academic Skills I (Computer Literacy)	CIPE	CHOO	C-401	Old C building (Computer room)
	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)		2nd semester students only
	3	Japanese Language (日本語)	CIPE			
	4	Japanese Language (日本語)	CIPE			
	5	Preparation for Oversea Study	HLSS	JEFFREYS Atsuko Marie		
Wed 水	1	Introduction to Computational Methods in Science and Engineering	M	MATUTTIS Hans-Georg	C-401	Old C building (Computer room)
	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	E3-1st floor	Computer Room (2nd Semester Students only)
	2	Advanced Theory of Systems Reliability	J	JIN Lu (金 路)		*
	3	Advanced Engineering Science I （Modern Optics and Photonics）	S	FURUKARA Rei (古川　怜)		
	4	Topics in Informatics II (Sustainable Supply Chain Management)	J	YAMADA Tetsuo (山田 哲男)		
	5					
Fri 金	1	Japanese Language (日本語)	CIPE			
	2	Japanese Language (日本語)	CIPE			
	3	Advanced Engineering Science II (Photonics and Opto-electronics)	S	UENO Yoshiyasu (上野 芳康)	W2-106	
	4					
	5	Advanced Engineering Science III (Exercises in Advanced Computational Sciences)	S	MORISHITA Toru (森下 亨)	E6-204	
		Information and Communications Technologies for SDGs	I	ISHIBASHI Koichiro （石橋 孝一郎） MATSUURA Motoharu (松浦 基晴)	E3-301	*
		English for Intercultural Communication	HLSS	OISHI Yukiko (大石　由紀子)		
Sat 土	1	Advanced Communication Engineering and Informatics I (Information and Communication Network)	I	OKI Eiji (大木 英司)	A101	* Intensive Course 4/17, 5/1, 5/15, 5/29(exercise), 6/12, 6/26, 7/10, 7/17(final exam)
	2					
-		Solid-State and Soft Matter Photonics	S	VOHRA Varun	-	* On-Demand Courses

* Joint classes with graduate programs

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

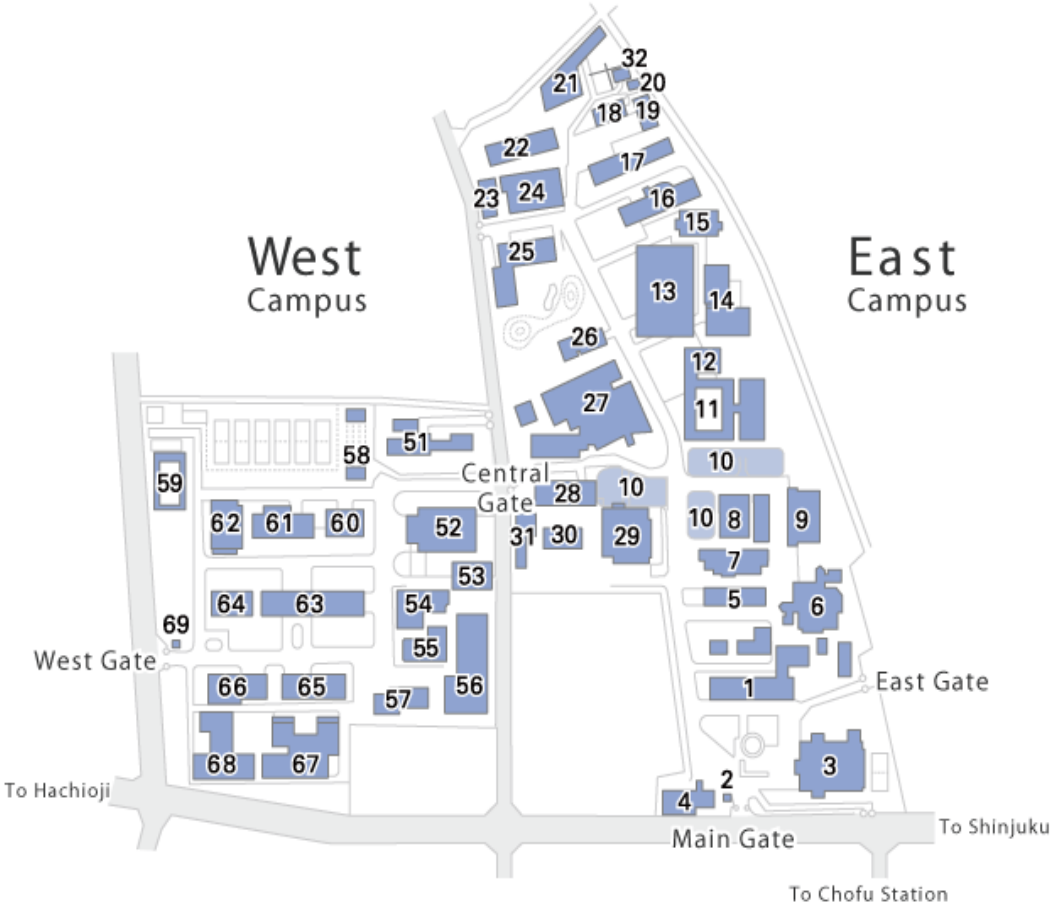
Home University's Time Zone

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

The time zone not recommended for taking a real-time 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）

Preparation for Overseas Study

General Information

Course title (Japanese)	Preparation for Overseas Study		
Course title (English)	Preparation for Overseas Study		
Course Code	ENG504z		
Academic year	2021	**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)	Atsuko Marie Jeffreys		
Office	East 1-807		
e-mail	ajeffreys@uec.ac.jp		
Course website	https://www.edmodo.com/		
Last updated	2021/03/10 2:06:46	**Update status**	Released

Course Description

Topic and goals	The main aim of this course is to help participants prepare for study abroad, first by identifying and pinpointing their goals in studying abroad, and then by detailing the steps in reaching their purposes. As the students leave their comfort zone of studying in their native country, they will have opportunities to learn what they can expect to find overseas either in life in general and on campus. They will also learn from the experiences of other international students who are studying at university here in Japan. This course will review the academic skills the students will need to exercise while studying overseas, which will have a positive effect when back in Japan.
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	Other advanced English courses
Course textbooks and materials	All the necessary materials will be provided by the instructor. No purchase of textbooks is necessary. The students, however, are expected to find on their own the materials needed for presentation and other activities.
Course outline and weekly schedule	The following is a tentative schedule. It may change depending on the size of class and the makeup of participants. Week 1: Course introduction Week 2: Self-introduction and study abroad goals Week 3: Finding and determining your research place Week 4: TOEFL preparation, application and other must-do activities before departure Week 5: History, culture and lifestyle of your new environment: general Week 6: History, culture and lifestyle of your new environment: on campus (1) Week 7: History, culture and lifestyle of your new environment: on campus (2) Week 8: Problems encountered while abroad Week 9: Academic skills needed: Autonomous learning and critical thinking Week 10: Academic skills needed: Reading and problem solving Week 11: Academic skills needed: Presentation and writing papers Week 12: Academic skills needed: Discussion and debating Week 13: Interview results Week 14: Final presentation (1) Week 15: Final presentation (2)

Distance learning information	Will be informed by the JUSST program office.
Preparation and review outside class	A lot of out-of-class work, such as reading, research, and interviews, is expected in order to ensure full participation in class activities.
Evaluation and grading	Self-introduction and study abroad goals 10% Class preparation 20% Interview with international students 10% Activities in class 30% Final presentation 30%
Office hours	Email the instructor to set up an appointment to meet for consultation.
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)	study abroad, academic skills

English for Intercultural Communication

General Information

Course title (Japanese)	English for Intercultural Communication		
Course title (English)	English for Intercultural Communication		
Course Code	ENG503z		
Academic year	2021	**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)	OOISHI Yukiko (大石　由紀子)		
Office	East 1－615室		
e-mail	yukiko@UEC ただしUECはuec.ac.jp		
Course website	None		
Last updated	2021/03/09 18:18:51	**Update status**	Released

Course Description

Topic and goals	This class will seek to understand culture, how it affects our daily lives, and how people from different countries and cultures act, communicate and perceive the world around them. The class will be project-based, and the two primary goals are to develop students' ability to use English for intercultural communication and to become more conscious of how English is used in Japan and elsewhere.
Prerequisites	Academic Spoken English I & II, Academic Written English I & II, Academic English for the Second Year I & II (These courses may not be necessary for international students.)
Recommended prerequisites and preparation	英語Exercise (drill)
Course textbooks and materials	None. All readings will be provided in class by the instructor or found by the students.
Course outline and weekly schedule	1: Introduction & discussion Theme 1: Culture and Everyday life Week 2: Discussion & Research assignment I Week 3: Group work & discussion Week 4: Video projects Week 4: Video projects Week 5: Presentations Theme 2: Idioms of the body and cultural differences Week 6: Discussion & Research assignment II Week 7: Group work & discussion Week 8: Group work & discussion Week 9: Presentations Week 10: Presentations Theme 3: Colors, words and cultural differences Week 11: Discussion & Research assignment Week 12: Group work & discussion Week 13: Discussion Week 14: Presentations Week 15: Presentations
Distance learning information	Will be informed by the JUSST program office.

Preparation and review outside class	Students will do individual and group research projects outside class. Individual writing assignments will be part of each of these projects. They will also prepare for presentations outside class.
Evaluation and grading	Active participation: 40% Writing assignments: 30% Presentations: 30%
Office hours	By appointment.
Message for students	This class will be held entirely in English. Students will be expected to actively engage in class-related activities both inside and outside class.
Others	None
Keyword(s)	Culture, communication, intercultural communication, English

VLSI Low Power Circuit Design

General Information

Course title (Japanese)	VLSI Low Power Circuit Design （大学院連携科目）		
Course title (English)	VLSI Low Power Circuit Design		
Course Code	ELEa01e ELEa01h ELEa01i ELEa04g ELEa06f		
Academic year	2021	**Year offered**	
Semester(s) offered	Spring semester	**Faculty offering the course**	
Teaching method		**Credits**	2
Category			
Cluster/Department			
Lecturer(s)	ISHIBASHI Koichiro (石橋　孝一郎)		
Office	W2-306		
e-mail	ishibashi@uec.ac.jp		
Course website	http://mtm.es.uec.ac.jp/index.html		
Last updated	2021/03/10 22:44:21	**Update status**	Released

Course Description

Topic and goals	VLSI Low Power Circuit Design
Prerequisites	Fundamental electric circuit theorems
Recommended prerequisites and preparation	Fundamental electric circuit theorems
Course textbooks and materials	Original lecture materials will be delivered on the class
Course outline and weekly schedule	Thanks of low power LSI, we nowadays enjoy ITC society with electronics appliances such as cell phones, electric cars and so on. The purpose of this lecture is to understand not only fundamentals of VLSI circuits, but low power circuit technologies which have made this ICT society into reality. Outline of Class and Contents 1) Introduction to rolls of VLS I on ICT society 2) Structure of MOSFET and its characteristics 3) Fundamentals of CMOS LSI circuits 4) Power on CMOS LSI 5) Moore?s law and Scaling law 6) Low power digital circuit design techniques - AC power reduction techniques - DC power reduction techniques 7) VLSI Varieties 8) Practice of Circuit Simulation Final exam will be done during the course.
Course content utilizing practical experience	Circuit simulation practice is done.
Distance learning information	Will be informed by the JUSST program office.
Preparation and review outside class	Review for the last lecture is recommended before the lectures.
Evaluation and grading	Final exam will be done for evaluation.　Evaluation is done by attendance of lectures and the final exam. Evaluation category (Score) are shown as bellow A(=>80), B(=>70), C(=>60), and D(<60)

Office hours	Send e-mail before going to the room of Ishibashi (W2-306)
Message for students	This class is focusing on not only low power circuit design but overview and fundamentals of VLSI technology . This class could make you access to semiconductor industry which is nowadays a kind of infrastructures.
Others	The lecture in this course, typeI, is mostly offered in English; PPT slides and handouts are also given in English.
Keyword(s)	VLSI, Low power, Circuit design

Advanced Communication Engineering and Informatics II （Optical Communication Engineering）

General Information

Course title (Japanese)	Advanced Communication Engineering and Informatics II （Optical Communication Engineering）（学域）		
Course title (English)	Advanced Communication Engineering and Informatics II （Optical Communication Engineering）		
Course Code	INT002c INT002d INT002f INT002g		
Academic year	2021	**Year offered**	3/4
Semester(s) offered	Spring 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)	KISHI Naoto (來住　直人)		
Office	East 3-1027		
e-mail	kishinaoto@uec.ac.jp		
Course website	http://www.opt.cei.uec.ac.jp/optc/		
Last updated	2021/03/08 13:25:54	**Update status**	Released

Course Description

Topic and goals	The main subject of this course is "Optical Communication". Optical communication is one of the key technologies for the contemporary information society. The history is still young, just about 30 years after being practically used, but it is developing rapidly nowadays, the communication ability is extremely outstanding and which is a communication technology that will be used in all parts of the society in the future. The goal of the course is to learn the fundamental principle and technical element of communication system, as well as introduce you to some of the latest communication technologies.
Prerequisites	Physics Introduction (wave and light), Electromagnetism related subjects, Electrical circuit
Recommended prerequisites and preparation	Knowledge of Fourier analysis, Fourier and concept of time- and frequency-domain
Course textbooks and materials	No textbooks needed. All course materials will be provided on-line via the URL listed above. (Password is required to access from off-campus)
Course outline and weekly schedule	The content is as follows: 1. Introduction to optical fiber communication. 2. Characteristic of light transmission medium of the optical communication and the difference with the low frequency electromagnetic wave. 3. Structure of the optical fiber transmission channel and a principle of optical waveguide. 4. Important characteristic of the optical fiber, i.e. the linear and non-linear characteristics and the relations with the signal transmission characteristics. 5. Principle of basic optical signal source, i.e. photo-generation principle. 6. Semiconductor laser light signal source, the light emitting diode structure characteristic and application. 7. Single frequency or a multi-wavelength source and pulse light source that specialized in optical communication. 8. Theory of optical amplifier in a long-distance optical communication system. 9. Characteristic of various optical amplifiers. 10. Light elements required in an optical communication system.

	11. Encoding of the digital light signal, the quality evaluation system of the signal reception. 12. The forms of the optical communication system. 13. Characteristic and the development of the optical communication system. 14. End uses optical fiber communication system. 15. Optical fiber sensor, light and optical fiber measurements.
Distance learning information	Will be informed by the JUSST program office.
Preparation and review outside class	Students are required to review (by accessing to the on-line material and other texts).
Evaluation and grading	Submission of a report will be required at the end of the term. Assessment of this course (pass) will be made over the report at a minimum of 60%.
Office hours	Wed (12:30 to 14:30) or after class.
Message for students	Optical communications play a vital role and came to be indispensable for a nowadays information and communication network. Gained knowledge of the technology and the principle, will come in useful for all aspects in information and communication fields.
Others	IFor regular students: 1) "Cluster II & III", "Department of Communication Engineering" and "Department of Engineering Science" students are not permitted to select the course (there is a Optical communication engineering course offered in the 3rd year). 2) Double enroll in Optical communication engineering course is not pemitted.
Keyword(s)	Telecommunications opticalfibers, dispersion properties, non-linear intensity modulation, direct detection, opticalrepeater, wavelength division multiplexing, laser diode, photo diode, opticalamplifiers, optical network, opticalfiber sensor.

Introduction to Computational Methods in Science and Engineering

General Information

Course title (Japanese)	Introduction to Computational Methods in Science and Engineering		
Course title (English)	Introduction to Computational Methods in Science and Engineering		
Course Code	INT505z		
Academic year	2021	**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)	Hans-Georg Matuttis		
Office	E4-721		
e-mail	hg@mce.uec.ac.jp		
Course website	https://webclass.cdel.uec.ac.jp		
Last updated	2021/03/17 10:20:38	**Update status**	Released

Course Description

Topic and goals	Computational methods have replaced analytical methods already in many fields of science and engineering, and their importance is still increasing. The aim of the lecture is to provide fundamental criteria for the choice of numerical methods, give an overview about some available methods in some fields, and give ideas about performance-oriented implementation for such methods. Depending on the background and interest of the auditory, some topics may be subject to changes.
Prerequisites	First year Analysis and Linear Algebra, one procedural Programming Language
Recommended prerequisites and preparation	NIL
Course textbooks and materials	Scriptum can be downloaded from http://webclass.cdel.uec.ac.jp/, further reading: A. L. Garcia, Numerical Methods for Physics, Benjamin-Cummings Pub Co,1999 G.J. Borse: Numerical Methods with Matlab, International Thomson Publishing, 1997
Course outline and weekly schedule	1. Simple MATLAB-Synthax 2. How to write better programs 3. Non-numerical methods: Monte-Carlo techniques 4. Representation of Numbers 5. Elementary numerical analysis I: What are numerical errors 6. Elementary numerical analysis II: How to get "correct" results from calculations "with error" 8. MATLAB Graphics 9. Introduction to numerical Linear algebra I: Repetition 1st year Linear Algebra 10. Introduction to numerical Linear algebra II: How to draw a line through more than 2 points (or maybe not) 11. Introduction to numerical Linear algebra III: Least squared fitting 12. Polynomials and Roots 13. Solving ordinary differential equations I: Basics Initial conditions, analytic solutions, Euler Method 14. Solving ordinary differential equations II: Higher order Methods Approaches to construct higher order methods, Runge-Kutta methods 15. Solving ordinary differential equations III: Advanced methods Adaptive Timesteps, energy conservation systems, stiff problems
Distance learning information	Course will be online - details will be announced on http://www2.matuttis.mce.uec.ac.jp

Preparation and review outside class	NIL
Evaluation and grading	- Participation and activity in the Lecture - Depending on the number of students, Homework in the E-Learning System or programming homework
Office hours	you contact me by E-Mail, other times are possible.
Message for students	
Others	Lecture starts after the the introduction to the computer system in the Jusst-Program has been held.
Keyword(s)	Numerical Analysis, Scientific Programming

Advanced Theory of Systems Reliability

General Information

Course title (Japanese)	システム信頼性特論 （H27以前入学生）		
Course title (English)	Advanced Theory of Systems Reliability		
Academic year	2021	**Year offered**	
Semester(s) offered	Spring semester	**Faculty offering the course**	
Teaching method		**Credits**	2
Category			
Cluster/Department			
Lecturer(s)	JIN Lu (金　路)		
Office			
e-mail	jinlu@inf.uec.ac.jp		
Course website	http://www.rm.inf.uec.ac.jp		
Last updated	2021/03/03 17:42:39	**Update status**	Released

Course Description

Topic and goals	This lecture deals with Reliability Engineering and its theory which focus on the philosophy, ideas and scientific methods to build　in quality and reliability into systems. Also, recent development of information technology has been changing the methods of Reliability Engineering. These new aspects are also dealt with.
Prerequisites	None
Recommended prerequisites and preparation	It would be helpful if the students have a background of probability and statistic.
Course textbooks and materials	No textbooks, just original material
Course outline and weekly schedule	Course Outline: #0: Guidance #1: Introduction to reliability engineering #2: Lifetime distribution functions and their application in reliability engineering #3: Maintainability and Availability #4: Lifetime Distribution and Hard Time Scheduled Maintenance(1) #5: Hard Time Scheduled Maintenance （２） #6: On Condition Maintenance #7: Stochastic Process and Markov Model #8: Reliability Evaluation of Engineering Systems Using Markov Model #9: Markov Decision Process #10: Condition Monitoring Maintenance (1) #11: Condition Monitoring Maintenance (2) #12: Systems Reliability(1)　Series system, parallel system, redundant design #13: Systems Reliability(2) Structure function and reliability assessment #14: Summary of this course
Distance learning information	Will be informed by the JUSST program office.
Evaluation and grading	Assessment will be based on the level of understanding
Office hours	Please take an appointment by email.
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	This lecture will be given in English.
Keyword(s)	Reliability, Quality Control, Maintenance

Advanced Engineering Science I （Modern Optics and Photonics）

General Information

Course title (Japanese)	Advanced Engineering Science I （Modern Optics and Photonics） （学域）		
Course title (English)	Advanced Engineering Science I （Modern Optics and Photonics）		
Course Code	INT001k INT001m INT001n INT001p		
Academic year	2021	**Year offered**	3/4
Semester(s) offered	Spring semester	**Faculty offering the course**	School of Informatics and Engineering
Teaching method	Lecture	**Credits**	2
Category	Core subjects		
Cluster/Department	Cluster III (Fundamental Science and Engineering)		
Lecturer(s)	FURUKARA Rei (古川　怜)		
Office	W1-207		
e-mail	furukawa@ee.uec.ac.jp		
Course website	none		
Last updated	2021/03/05 15:59:51	**Update status**	Released

Course Description

Topic and goals	INT001 covers interactions between lightwave and matter in multiple scales.
Prerequisites	Electromagnetics
Recommended prerequisites and preparation	Electromagnetics
Course textbooks and materials	Frank L. Pedrotti, S.J., Leno S. Pedrotti (1993). Introduction to Optics 2nd edition. Prentice-Hall, Inc. Max Born, Emil Wolf (1997). Principles of Optics 7th edition. Cambridge University Press. S.O. Kasap (2001). Optoelectronics and Photonics: Principles and Practices. Prentice-Hall, Inc.
Course outline and weekly schedule	1 Type of interactions between lightwave and matters 2 Interaction with group of atoms 3 Mathematical expression of harmonic waves 4 Interaction with molecular unit 4.1 Matrix treatment of polarization 4.2 Dielectric tensor in an anisotropic medium 4.3 Ellipsoid expression of wave normals 4.4 Intrinsic and stress birefringence 5 Interaction with sub-micron inhomogeneity 5.1 Waveguide condition and propagation modes 5.2 Fiber optic data transmission
Course content utilizing practical experience	Optical characterizations of materials Evaluations on single/multimode fiber-optic transmission
Distance learning information	Those who are considering to register this course must email the lecturer before the first lecture. Students will later receive an invitation to the online class.
Preparation and review outside class	Assignments are given every week
Evaluation and grading	Assignments 10% Exams 90%
Office hours	To be announced in the class
Message for students	Students who are considering to register this course must email the lecturer before the first lecture.
Others	none
Keyword(s)	polarization, dielectric tensor, birefringence, waveguides

Topics in Informatics II（Sustainable Supply Chain Management）

General Information

Course title (Japanese)	Topics in Informatics II （Sustainable Supply Chain Management）（学域）		
Course title (English)	Topics in Informatics II （Sustainable Supply Chain Management）		
Course Code	INT002a INT002b INT002e		
Academic year	2021	**Year offered**	2/3/4
Semester(s) offered	Spring 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)	YAMADA Tetsuo (山田　哲男)		
Office	Room #507 in Building West 5		
e-mail	tyamada@uec.ac.jp		
Course website	http://webclass.cdel.uec.ac.jp/webclass/　Note: Login to the webclass and join the course!		
Last updated	2021/03/09 18:26:55	**Update status**	Released

Course Description

Topic and goals	Supply Chain is that product and information flows among suppliers, factories, distribution centers and markets by manufacturing and logistics. This supply chain is now globally networked consisting of not only domestic but also overseas suppliers, factories and markets. Thus, the global supply chain management is required to pursue higher profit for companies. On the other hand, the environmental issues such as global warming and material starvation have been more serious because manufacturing and logistics inevitably consume natural resources for materials and energy and emit Greenhouse Gases (GHG) including CO2 throughout their product lifecycle and supply chain. In order to not to become more serious for the environmental issues, it is necessary for the supply chain to minimize the material and energy consumptions during the whole product lifecycle economically. This course gives variety topics in supply chain management and sustainability, and acquire how to harmonize the supply chain and sustainability simultaneously.
Prerequisites	None
Recommended prerequisites and preparation	Production Management, Operations Research, Introduction to Operations Research
Course textbooks and materials	No textbook, Handouts will be used as a guide for the class.
Course outline and weekly schedule	1. Guidance 2. Sustainable Manufacturing 3. Supply Chain Management 4. Global Supply Chain 5. Assembly Line System 6. Innovation Analysis for Manufactures by Text Mining 7. SNS Analysis for Manufactures by Text Mining 8. Closed-loop Supply Chain 9. Disassembly, Reuse and Recycling 10. Low-carbon Supply Chain 11. Life Cycle Assessment 12. Carbon Tax 13. Health Care Systems Engineering 14. Work Life Balance 15. Summary

Distance learning information	Access to the UEC webclass and join the course. The ZOOM information is on the webclass.
Preparation and review outside class	Several assignments will be conducted.
Evaluation and grading	Evaluation: Presentations (30%), Activities (40%) and Assignments (30%)
Office hours	Mondays at the 4th class. Make an appointment by e-mail in advance.
Message for students	Let’s discuss how to harmonize supply chain and sustainability and enjoy it!
Others	No assignment, No success. This course is taught in English, and Japanese is also added as the need arises.
Keyword(s)	Global Supply Chain, Sustainable Manufacturing, Reuse and Recycling, Low-carbon and Closed-loop Supply Chain, Sustainable Product Design, Assembly/Disassembly, Scheduling, Health Care Systems Engineering, Work Life Balance

Advanced Engineering Science II （Photonics and Opto-electronics）

General Information

Course title (Japanese)	Advanced Engineering Science II （Photonics and Opto-electronics）（学域）		
Course title (English)	Advanced Engineering Science II （Photonics and Opto-electronics）		
Course Code	INT002k INT002m INT002n INT002p		
Academic year	2021	**Year offered**	3/4
Semester(s) offered	Spring semester	**Faculty offering the course**	School of Informatics and Engineering
Teaching method	Lecture	**Credits**	2
Category	Core subjects		
Cluster/Department	Cluster III (Fundamental Science and Engineering)		
Lecturer(s)	UENO Yoshiyasu (上野　芳康)		
Office	Room no. 313, Building no. West-2 (W2-313).		
e-mail	uenoy@ultrafast.ee.uec.ac.jp		
Course website	http://www.ultrafast.ee.uec.ac.jp/ueno-classes.html		
Last updated	2021/03/17 11:47:53	**Update status**	Released

Course Description

Topic and goals	Modern photonics and electronics have been deeply spread to both academy and industry of our Real World, without country borders. It is because photonics and opto-electronics have realized terabit-per-second network infrastructures, optical-disk memories (DVD&CD's), compact and accurate laser diodes (from infrared to blue), and flat displays, in industry uses and home uses. In these science and technology, particle-based photonic properties of representative materials are almost always fully combined with their wave-based optical properties, in "bright" manners. In this course, typically 15 weeks, participants are expected to study and understand the scientific fundamentals of these photonic technology, and also to develop interests to on-going, long-term (i.e. large-scale) R&D activities in our world.
Prerequisites	fundamentals of electro-magnetic waves (propagating in speed of light). fundamentals of electronics such as basic diodes and transistors.
Recommended prerequisites and preparation	fundamentals of quantum mechanics (particles and waves). fundamentals of crystalline materials and their basic, electronic properties.
Course textbooks and materials	1) Saleh and Teich, Fundamentals of Photonics, 2nd edition, Wiley, 2007. 2) Amnon Yariv and Pochi Yeh, Photonics: Optical Electronics in Modern Communications, 6th edition, Oxford, 2006.
Course outline and weekly schedule	1st-5th weeks: (1) Areas of science and technology where photonics and opto-electronics play particularly important roles in our world. (2) Representative photonic devices and materials that many of us must use and rely on, in these areas of science and technology. (3) Fundamental properties of silicon and other few important types of semiconductor crystals. Basics of direct transition (for light-emitting diodes and lasers), in contrast to indirect transition (for sensors and solar cells, for example). Then, basics of quantum-particle-based properties such as conservation laws in unit of electron-volts, in contrast to quantum-wave-based properties. (All of these are well understood and designed in all LED's, laser diodes, optical sensors, solar cells, for example.) 6th-10th weeks: (4) General relationship from electrons to electron waves. That from lightwaves (em waves) to photons. (5) Device's internal structures (of light-emitting diodes and light-absorbing sensors), and their working principles. (6) Energy conversion law and general limits in energy-conversion efficiency, from electronic energy to photonic energy. That in the opposite direction, that is, from photonic energy to

	electronic energy. 11th-15th weeks: (7) advanced groups of lasers, consisting of cavities and waveguides, which are deeply and broadly used in advanced systems such as network infrastructures (terabit per second), optical-disk memories (DVD&CD's), compact and accurate laser diodes (from infrared to blue). (8) high-density light energy in time and 3D-space dimensions (total four dimensions), that is rather simply generated by laser oscillators in particular. (Several kinds of experimental research are going on in our UEC campus, as well.)
Distance learning information	To be informed.
Preparation and review outside class	Both personal and group studies, efficiently before and after each weekly classroom, are encouraged.
Evaluation and grading	Understanding level of each student is evaluated, in the final test in the end of the 15-week course.
Office hours	6th period, Tuesdays. (Notify me Ueno by email, when I was not available in the period of tuesday.)
Message for students	The number of participants to this course will be around 10, too, and, could be slightly less. So, this lecturer Ueno welcomes questions from participants sometimes in the middle of 90 minutes, rather than after it. Your asking good questions to lecturer inspires the other participants, too, basically.
Others	Lecturer Ueno's international activities: http://www.ultrafast.ee.uec.ac.jp/ueno-cv.html
Keyword(s)	photonics, opto-electronics, quantum mechanics, electro-magnetic waves, light-emitting diodes (spontaneous emission), lasers (stimulated emission), optical sensors, solar batteries, silicon, galium arsenide, semiconductor.

Advanced Engineering Science III
(Exercises in Advanced Computational Science)

General Information

Course title (Japanese)	上級コンピュータ演習		
Course title (English)	Exercises in Advanced Computational Science		
Course Code	COM501k COM501m COM501n COM501p		
Academic year	2021	**Year offered**	3
Semester(s) offered	Spring semester	**Faculty offering the course**	School of Informatics and Engineering
Teaching method	Lecture/Exercise (drill)	**Credits**	2
Category	Core subjects		
Cluster/Department	Cluster III (Fundamental Science and Engineering)		
Lecturer(s)	OZEKI Yukiyasu (尾関　之康), OHFUTI Yasushi (大淵　泰司), SAITO Hiroki (斎藤 弘樹), KASHIMORI Yoshiki (樫森　与志喜), SHIRAKAWA Hideki (白川 英樹), NAKAMURA Jun (中村 淳), MORISHITA Toru (森下　亨)		
Office	East6-528 (Morishita)		
e-mail	NIL		
Course website	NIL		
Last updated	2020/03/13 21:51:54	**Update status**	Released

Course Description

Topic and goals	[Topic] In the modern information society, advanced computer programming knowledge and technology are important in any industrial field. In this lesson, the instructor is selected from a plurality of lectures, and the students themselves have to set the assignments while consulting with the instructor. Then, the students are asked to construct the program code and examining results that aim to acquire a wide range of knowledge and skills in computer programming. In addition, since the course is offered as an international subject, when taking the course as an international subject, you are required to give a presentation in English and acquire international background. [Goals] Assignment/task setting Execute the task Examine the results Discuss the results with lecture to build and develop the computer programming knowledge and skills
Prerequisites	Computer Literacy, Fundamental Programming
Recommended prerequisites and preparation	Numerical Analysis, Computer Programming and Applications, Numerical Calculus for Science and Engineering
Course textbooks and materials	NIL
Course outline and weekly schedule	Guidance is held on the 1st class and students will be divided into groups. Each group will appoint an instructor (lecturer). Students will receive the explanations and the basic knowledge from the instructor and set the assignments accordingly. The programming language, OS, etc. will be decided in consultation with the instructor. Several meetings and report on progress will be held. Give a final presentation about the assignment at the end of the semester. 1. Guidance 2. Assignment 1 3. Assignment 2 4. Assignment 3 5. Assignment 4 6. General Meeting

	7. Assignment 5 8. Assignment 6 9. Assignment 7 10. Assignment 8 11. Assignment 9 12. Assignment 10 13. Assignment 11 14. Assignment 12 15. Final Presentation The assignments/contents are decided in consultation with the instructor.
Distance learning information	Will be informed by the JUSST program office.
Preparation and review outside class	Consult with the instructor for more information.
Evaluation and grading	Comprehensively evaluate by 1) the assignment's setting, performance and the examine of the results, and 2) the final presentation.
Office hours	Consult with the instructor
Message for students	As long as you work and develop your knowledge and programming skills, in consultation with your instructor, you may proceed with what you want to do regardless the programming language and OS. Since the courses are offered as an international course, you can also acquire the international/global skills.
Others	NIL
Keyword(s)	Exercises in Advanced Computational Science

Information and Communications Technologies for SDGs

General Information

Course title (Japanese)	SDGsを支える情報通信論		
Course title (English)	Information and Communications Technologies for SDGs		
Course Code			
Academic year	2021	**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 practical education subjects		
Cluster/Department	Offered for all departments		
Lecturer(s)	ISHIBASHI Koichiro (石橋　孝一郎), MATSUURA Motoharu (松浦　基晴)		
Office	West ２-306(石橋） West 2-306(Ishibashi), East 3-1028（松浦） East 3-1027(Matsuura)		
e-mail	ishibashi(at)uec.ac.jp		
Course website	BHN Kuwabara Foundation Donation Course http://bhn-uec.net/		
Last updated	2021/03/08 16:26:32	**Update status**	Released

Course Description

Topic and goals	Topic: SDGs (Sustainable Development Goals) means the international goal of "The Sustainable Development Agenda" adopted at the United Nations summit in Sep 2015, are a universal concern not only for developing countries but also for developed countries, and Japan is actively engaged in wide fields. In this course, students will understand the purpose of the SDGs and ICT (Information and Communications Technologies) that support the SDGs, and learn the energy, information security and ICT policy that are important for achieving SDGs. Then, students will study several specific fields where ICT are contributing to SDGs, through lectures and on-the-spot tours. Goals: 1) Understand the establishment and meaning of the SDGs, and key issues regarding ICT for SDGs, i.e. energy, information security and ICT policy. 2) Study how ICTs are contributing to realize SDGs. 3) Cultivating engineers' readiness and foresight toward the realization of SDGs.
Prerequisites	None
Recommended prerequisites and preparation	None
Course textbooks and materials	None
Course outline and weekly schedule	All lectures will be given mainly in English. #1 April 16(Fri), 5th period “Introduction” Prof. ISHIBASHI Koichiro “How ICT is related to SDGs” Lecturer KANO Sadahiko (BHN, Emer. Prof. of Waseda Univ.) #2 April 23 (Fri), 5th period “About SDGs including BHN activities” Lecturer TOMINO Takeshi (BHN) #3 May 7 (Fri), 5th period “Energy as key issue to achieve SDGs” Emer. Prof. ICHIKAWA Haruhisa #4 May 14(Fri), 5th period “Information security as key issues to achieve SDGs” Lecturer HARADA Yonosuke (Emer. Prof. of Institute of Information Security) #5 May 21 (Fri), 5th period “ICT policy to realize SDGs” Lecturer SAKAMOTO Yasuo (NTT Docomo) #6 May 28(Fri), 5th period “ICT for regional revitalization”

	Lecturer KOBAYASHI Tadao (IEEE802.11ah Promotion Council, President) #7 June 4(Fri), 5th period “ICT for healthcare” Lecturer KUREMATSU Hachihei (BHN) #8 June 11 (Fri), 5th period “ICT for welfare” Prof. YOKOI Hiroshi #9 June 18 (Fri), 5th period “ICT for disaster prevention and mitigation” Lecturer UMINO Shinobu (BHN) #10 June 25(Fri), 5th period “ICT for earth environment” Lecturer NAKAMURA Kenji (Prof. of Dokkyo Univ.) #11 July 2 (Fri), 5th period “ICT for agriculture and fishery” Prof. ISHIBASHI Koichiro #12, #13 July 16 (Fri), 5th and 6th period “Presentation and discussion of exercises (see below)” Prof. ISHIBASHI, Prof. MATSUURA, Prof. MIKI, Lecturer KUREMATSU #14, #15 Early September “Technical tour” in the area of Sendai and Ishinomaki, Miyagi Prefecture (Subject to cancellation, depending on the infection status of COVID-19.) [Exercises] Consider ideas and proposals for solving problems related to SDGs in your hometown or home country using ICT.
Course content utilizing practical experience	The faculty members for this course have a lot of experiences in joint research with enterprises. In addition, lecturers from outside have enough practical business knowledge in the ICT related industrial world. This course includes very practical contents, since it is provided in an omnibus format by these members.
Distance learning information	・Classroom: East 3-301 (3rd Floor) ・If you are unable to attend a face-to-face class due to unavoidable circumstances, please attend a live online class. It is also possible to take on-demand classes at a later date. ・To take online classes, use the Chrome browser to access the e-learning site at URL bellow and login with ID / Password. The "e-learning course manual" is also available there. ・URL: http://www.super-program.jp/bhn_moodle/ ・ID and Password will be informed by the JUSST program office.
Preparation and review outside class	Read the lecture materials provided in advance so that you can ask questions during class.
Evaluation and grading	Evaluation method: The contents of the presentations and discussions at the exercise and the reports on the final assignments will be evaluated comprehensively. Evaluation criteria The level of understanding of learning goals 1) and 2) and the attitude toward learning 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) has been fully cultivated. B (70-79 points): It is recognized most of goals 1) and 2) are achieved, and goal 3) has been cultivated. C (60-69 points): It is recognized most of goals 1) and 2) are achieved fairly, and goal 3) has been cultivated to some extent. D (59 points or less, rejected): Goals 1) and 2) are not fully achieved and goal 3) has not been cultivated.
Office hours	Take appointments by email in advance.
Message for students	This course holds technical tours to SDGs related sites during the summer vacation. However, it may be canceled depending on the infection status of COVID-19.
Others	Classes will be held in Room 301 of East-3 Building. They will be provided online to students of other universities who are taking super-cooperative graduate program.
Keyword(s)	SDGs, ICT, information security, energy, medical and welfare, disaster prevention, earth environment

Advanced Communication Engineering and Informatics I (Information and Communication Networks)

General Information

Course title (Japanese)	情報通信ネットワーク （大学院連携科目）		
Course title (English)	Information and Communication Networks		
Course Code	ELEa01g ELEa02f		
Academic year	2021	**Year offered**	
Semester(s) offered	Spring semester	**Faculty offering the course**	
Teaching method		**Credits**	2
Category			
Cluster/Department			
Lecturer(s)	OKI Eiji (大木　英司)		
Office			
e-mail	oki@i.kyoto-u.ac.jp		
Course website	http://icn.cce.i.kyoto-u.ac.jp/member/profile02		
Last updated	2021/03/04 9:58:57	**Update status**	Released

Course Description

Topic and goals	Communication networks serve as the most important infrastructure for the today's information society. This course deals with mathematical programming and algorithms for communication networks. The course objectives are to understand the fundamental concepts communication networks and theories for network designs and controls, and bridge the gap between the theories and practices.
Prerequisites	The minimum requirement to understand this course is a knowledge of linear algebra and computer logic.
Recommended prerequisites and preparation	Undergraduate courses related to information, communications, networks, probability and statistics, and mathematical programming.
Course textbooks and materials	Book 1: Textbook, E. Oki, Linear Programming and Algorithms for Communication Networks, CRC Press, Boca Raton, 2012. Book 2: Book 1 (Japanese version)，大木英司, 通信ネットワークのための数理計画法, コロナ社, 2012. The contents of this course are almost covered by Book 1.
Course outline and weekly schedule	The lecture including materials in this course, type I, is offered in English. The subjects include the following items. The topics may be subject to change due to the progress. 1. Introduction and Basic problems for communication networks 2. Algorithms for basic problems (Shortest path routing max flow problem) 3. Algorithms for basic problems (Minimum-cost flow problem) 4. Disjoint path routing 5. Liner programming basics 6. Application of liner programming 7. Mid-term exercise/examination 8. GLPK (GNU Liner Programming Kit) 9. Basic problems solved by LP 10. Disjoint path routing and wavelength assignment solved by LP 11. Routing and traffic demand model (basics) 12. Routing and traffic demand model (hose models and others) 13. Mathematical puzzles 14. Advanced mathematical puzzles 15. Advanced topics

Distance learning information	Will be informed by the JUSST program office.
Preparation and review outside class	As preparation, read the corresponding chapter of the textbook.
Evaluation and grading	Methods: Homework, and mid-term and final examinations Criteria: Fundamentals and theories (50%) Practices (50%)
Office hours	After lecture. Others make appointment by email.
Message for students	The students are required to study the textbook to understand the contents of this course. Lecture will be given mainly in English. Both Japanese and English is allowable for question.
Others	See "Distance learning information" for lecture schedule (date and time) and lecture materials.
Keyword(s)	Information and communication, communication network, design and control, mathematical programming, algorithm

Solid-State and Soft Matter Photonics

General Information

Course title (Japanese)	固体・ソフトマターフォトニクス特論		
Course title (English)	Solid-State and Soft Matter Photonics		
Course Code			
Academic year	2021	**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 development subject)		
Cluster/Department	Department of Engineering Science		
Lecturer(s)	Vohra Varun		
Office	W8-717		
e-mail	varun.vohra@uec.ac.jp		
Course website	https://classroom.google.com/u/2/c/MjkyOTQ5Nzg5OTUx		
Last updated	2021/03/08 12:31:36	**Update status**	Released

Course Description

Topic and goals	Soft matter physics is a relatively new sub-field of solid-state physics. Materials such as liquid crystals, biomaterials, polymers and colloids demonstrate complex behavior when exposed to external stimuli but they also present several advantages. Unlike conventional hard matter, soft matter can be easily processed into various self-assembled nanostructures that exhibit strong iridescence or anti-reflective properties. Nature provides us with several soft matter photonic materials examples like bright colored butterfly wings, photonic eyes that can see in the dark or photosynthetic systems that transform sunlight into chemical energy. We will carefully study these natural systems and review several bio-inspired technologies based on nanostructured soft matter. In this course, we will focus on light manipulation in nanostructured materials as well as light harvesting or light generation in soft matter optoelectronic devices.
Prerequisites	There are no compulsory prerequisites but having studied one of the following courses would be an advantage: 光波工学 (Introduction to photonics), 波動と光(Waves and Optics), 固体物理工学第一・第二(Solid-State Physics I and II), 物理化学第一・第二(Physical Chemistry I and II) or 固体電子論 (Fundamentals of Solid-State Electronics)
Recommended prerequisites and preparation	There are no compulsory prerequisites but having studied one of the following courses would be an advantage: 光波工学 (Introduction to photonics), 波動と光(Waves and Optics), 固体物理工学第一・第二(Solid-State Physics I and II), 物理化学第一・第二(Physical Chemistry I and II) or 固体電子論 (Fundamentals of Solid-State Electronics)
Course textbooks and materials	Lecture notes as well as other material related to this course will be uploaded directly to Google Classroom

Course outline and weekly schedule	Note: The following weekly schedule is subject to change 1. Solid-state soft matter photonics: definitions and course modules 2. Colors in nature: light absorption and structural coloration 3. Natural and bio-inspired photonic technologies (I) (Butterfly wings) 4. Natural and bio-inspired photonic technologies (II) (Chameleon skin) 5. Natural and bio-inspired photonic technologies (I) (Moth eye) 6. Absorption and energy transfer in photosynthetic systems 7. Soft and flexible organic semiconductors 8. Bio-inspired photovoltaic technology (I) (Dye-sensitized solar cells) 9. Bio-inspired photovoltaic technology (II) (Organic solar cells) 10. Bio-inspired photovoltaic technology (III) (Solar cells employing natural dyes) 11. Bio-inspired photovoltaic technology (IV) (Enhanced efficiency in organic solar cells) 12. Soft matter lighting technology I (Organic LEDs and lasers) 13. Soft matter lighting technology II (Color tuning through energy transfer) 14. Soft matter lighting technology III (Liquid crystal displays) 15. Final exam
Distance learning information	This course will be carried out through on-demand lessons via the UEC Google Classroom (Class code: vtjmrnz) Additional information will be uploaded directly on the UEC Google Classroom.
Preparation and review outside class	Lecture notes as well as other material related to this course will be uploaded directly to Google Classroom
Evaluation and grading	(a) Homework and reports: 50% (Homework quality/contents, efforts towards self-study) (b) Motivation and participation: 20% (On-time submission of reports, quality of the questions asked in Google Classroom) (c) Final exam: 30% The final exam will consist in preparing a 10-15 min video presentation in which the students will summarize and review the contents of an academic paper related to solid-state soft matter photonics (subject to change). A total score (a + b + c) over 60% is required to pass this course.
Office hours	Your questions and comments can be useful to other students. Therefore, the preferred method is to write them directly in the comments section in Google Classroom (visible to others). Alternatively, you can send them via email to varun.vohra@uec.ac.jp (not visible to others). Finally, if you need additional explanations or clarifications, you can send your request also via email and we will organize a face-to-face meeting in W8-717 or a Zoom meeting.
Message for students	The lecture will be carried out in English but this should not scare you. The level of English is not one of the evaluation criteria for this class. I hope that this class will provide you with the opportunity to improve your skills in English while learning about fun science. The lecture covers a broad range of exciting topics and you will be given the opportunity to learn about soft matter photonics from various points-of-view. In fact, the knowledge you will acquire is a blend of physical chemistry, optics, device engineering and materials science. I hope you will enjoy this lecture that links fundamental science with recent advanced technologies.
Others	This course will be carried out through on-demand lessons via the UEC Google Classroom https://classroom.google.com/u/2/c/MjkyOTQ5Nzg5OTUx Class code: vtjmrnz You can only access and enroll for the class via your UEC Google account If you have issues with the enrollment to the class, please contact me at: varun.vohra@uec.ac.jp
Keyword(s)	Photonic crystals, Bio-inspired nanostructures, organic electronics, LCD, OLED

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	2021	**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	2021/03/09 18:32:19	**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 (List, Tables and Interactivity, Cascading Style Sheet; CSS) 15. HTML (Project Work) ========== 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. Note that the lecture schedule is subject to constant revisions throughout the course.

Distance learning information	Will be informed.
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, 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	2021	**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	2021/03/09 18:33:52	**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. 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 ========== 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. Note that the lecture schedule is subject to constant revisions throughout the course.

Distance learning information	Will be informed.
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	2021	**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	2021/03/09 18:34:38	**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, 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 ========== 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. Note that the lecture schedule is subject to constant revisions throughout the course.

Distance learning information	Will be informed.
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 give 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