

# Course Description

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

Spring Semester, 2020

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

We stay **U**nited against the **E**nnovational **C**hallenge



国立大学法人  
電気通信大学



**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

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

\*) Japanese language classes may be exempted in the 2<sup>nd</sup> 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.

[illegible]

# Time-Table for Spring Semester, 2020

## 令和2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 (来住 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)		For 2nd semester students only
	3	Japanese Language (日本語)	CIPE			
	4	Japanese Language (日本語)	CIPE			
	5					
Wed 水	1	Advanced Engineering Science I (Modern Optics and Photonics)	S	TOMITA Yasuo (富田 康生)	W1-214	
		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	Research Presentation	HLSS	Atsuko Marie JEFFREYS	C-402	Old C building (Computer room)
Thu 木	1	UEC Academic Skills III (Publishing Literacy and Research)	CIPE	CHOO	E3-1st floor	Computer Room
	2	Advanced Theory of Systems Reliability	J	JIN Lu (金 路)	W5-209	*
	3					
	4	Topics in Informatics II (Sustainable Supply Chain Management)	J	YAMADA Tetsuo (山田 哲男)	W5-209	
	5					
Fri 金	1	Japanese Language (日本語)	CIPE			
	2	Japanese Language (日本語)	CIPE			
	3	Advanced Engineering Science II (Photonics and Optoelectronics)	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	*
		Rediang Scientific Research	HLSS	OISHI Yukiko (大石 由紀子)	C-402	Old C building (Computer room)
Sat 土	1	Advanced Communication Engineering and Informatics I (Information and Communication Network)	I	OKI Eiji (大木 英司)	A101	Intensive Courses 5/6, 5/30, 6/13, 6/20, 6/27, 7/11, 7/18, 7/25, 8/1 (final exam)
	2					

\* Joint classes with regular graduate students

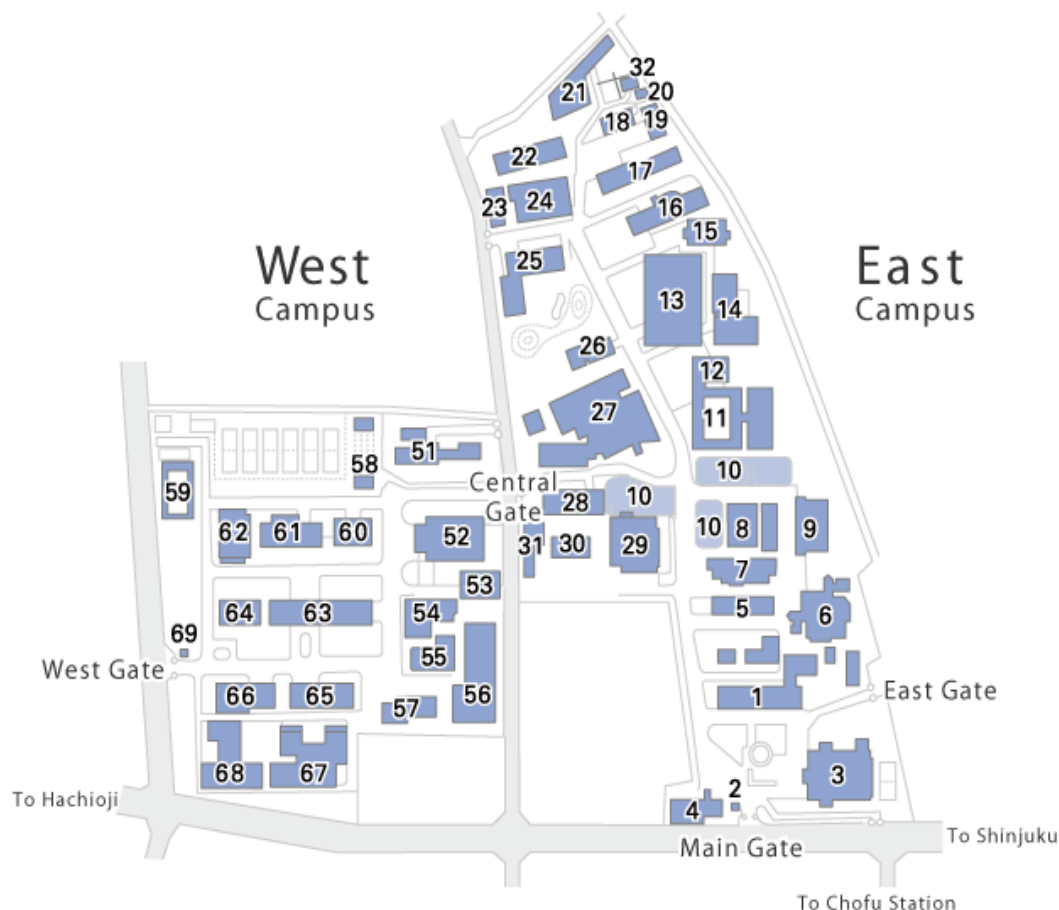
## Department 学科等

**J:** Department of Informatics (情報学専攻)  
**I:** Department of Computer and Network Engineering (情報・ネットワーク工学専攻)  
**M:** Department of Mechanical and Intelligent Systems Engineering (機械知能システム学専攻)  
**S:** Department of Engineering Science (基盤理工学専攻)  
**CIPE:** Center for International Programs and Exchange (国際教育センター)  
**SPORTS:** UEC Physical Education Division (健康・スポーツ科学部会)  
**HLSS:** The Division of Humanities Languages and Social Sciences (総合文化部会)

## Period 授業時間

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

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

## Course Description

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



<b>Course content utilizing practical experience</b>	
<b>Preparation and review outside class</b>	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.
<b>Evaluation and grading</b>	<p>Evaluation is given as follows; (Tasks 50%, Mid-Semester presentation 30%, Final presentation 20%)</p> <p>Since this course is a practical course, attendance and participation in class is obligatory. Only students who have 1) maintained at least 70% of attendance, 2) submitted all the assignments and 3) made their Mid-semester &amp; final presentations can obtain the credits.</p>
<b>Office hours</b>	12:00-13:00, for just-in-case, schedule an appointment before walking in.
<b>Message for students</b>	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.
<b>Others</b>	Students are expected to come to class on time. Absences are excused in case of emergency, illness, or trips to conferences.
<b>Keyword(s)</b>	Unix, HTML, Latex, Website

# UEC Academic Skills II (Information Literacy and Research)

## General Information

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

## Course Description

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

<b>Course content utilizing practical experience</b>	
<b>Preparation and review outside class</b>	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.
<b>Evaluation and grading</b>	<p>Evaluation is given as follows; (Assignments 50%, midterm presentation 20%, Poster presentation 30%)</p> <p>Since this course is a practical course, attendance and participation in class is obligatory. Only students who have 1) maintained at least 70% of attendance, 2) submitted all the assignments and 3) made their poster presentations can obtain the credits.</p>
<b>Office hours</b>	12:00-13:00, for just-in-case, schedule an appointment before walking in.
<b>Message for students</b>	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.
<b>Others</b>	Students are expected to come to class on time. Absences are excused in case of emergency, illness, or trips to conferences.
<b>Keyword(s)</b>	Research, library, Desktop publishing, poster presentation

# UEC Academic Skills III (Publishing Literacy and Research)

## General Information

<b>Course title (Japanese)</b>	UEC Academic Skills III (Publishing Literacy and Research)		
<b>Course title (English)</b>	UEC Academic Skills III (Publishing Literacy and Research)		
<b>Course Code</b>	INT003z		
<b>Academic year</b>	2020	<b>Year offered</b>	3/4
<b>Semester(s) offered</b>	Spring semester	<b>Faculty offering the course</b>	School of Informatics and Engineering
<b>Teaching method</b>	Lecture	<b>Credits</b>	2
<b>Category</b>	General culture subjects		
<b>Cluster/Department</b>	School of Informatics and Engineering		
<b>Lecturer(s)</b>	Choo Cheow Keong		
<b>Office</b>	E2-305		
<b>e-mail</b>	uec-as3@fedu.uec.ac.jp		
<b>Course website</b>	<a href="http://www.fedu.uec.ac.jp/skills">http://www.fedu.uec.ac.jp/skills</a>		
<b>Last updated</b>	2020/03/13 21:23:22	<b>Update status</b>	Released

## Course Description

<b>Topic and goals</b>	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.
<b>Prerequisites</b>	UEC Academic Skills I (Computer Literacy) or コンピューターリテラシー
<b>Recommended prerequisites and preparation</b>	UEC Academic Skills II (Information Literacy and Research)
<b>Course textbooks and materials</b>	NIL
<b>Course outline and weekly schedule</b>	<p>Course schedule and topics that will be covered</p> <p>=====</p> <ol style="list-style-type: none"> <li>1. Introduction (Usage: The Information Technology Center etc.)</li> <li>2. Academic Integrity (Interesting and Unpublished, Scientific misconduct)</li> <li>3. Researcher's outputs (Why, How, Where)</li> <li>4. Planning the research/research protocol (LaTeX editor, Mind mapping, brainstorming etc.)</li> <li>5. Proposing and Reporting on Research</li> <li>6. Making scientific presentation</li> <li>7. Midterm Presentation 1/2</li> <li>8. Midterm Presentation 2/2</li> <li>9. Brush up on your skills (Handling Q&amp;A)</li> <li>10. Communication and Correspondence (Peer, Researcher, Editor, etc.)</li> <li>11. Academic publishing (Overviews; Dissertation, Monograph, Scientific paper )</li> <li>12. Academic publishing (Procedures, Processes and standards)</li> <li>13. Assessment and evaluation</li> <li>14. Oral presentation 1/2</li> <li>15. Oral presentation 2/2</li> </ol> <p>=====</p> <p>The lecture is designed to support the pursuit of writing research paper and share the skills of quality publishing. All the lectures are linked with practical activities, and at the end of the course, the students are required to write a paper and give a presentation on their research-based projects.</p> <p>Note that the lecture schedule is subject to constant revisions throughout the course.</p>

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

# Research Presentation

## General Information

<b>Course title (Japanese)</b>	Research Presentation		
<b>Course title (English)</b>	Research Presentation		
<b>Course Code</b>	ENG502z		
<b>Academic year</b>	2020	<b>Year offered</b>	3/4
<b>Semester(s) offered</b>	Spring semester	<b>Faculty offering the course</b>	School of Informatics and Engineering
<b>Teaching method</b>	Lecture	<b>Credits</b>	2
<b>Category</b>	General culture subjects		
<b>Cluster/Department</b>	School of Informatics and Engineering		
<b>Lecturer(s)</b>	Atsuko Marie Jeffreys		
<b>Office</b>	East 1-807		
<b>e-mail</b>	ajeffreys@uec.ac.jp		
<b>Course website</b>	<a href="https://www.edmodo.com/">https://www.edmodo.com/</a>		
<b>Last updated</b>	2020/03/03 1:24:21	<b>Update status</b>	Released

## Course Description

<b>Topic and goals</b>	<p>The goal of this course is for students to be able to explain their research results in such a way as to attract and maintain the audience's attention and ensure their understanding all throughout the presentation.</p> <p>Through this course, the students will master the art of public speaking, with topics based on the research they have made, or are intending to make.</p>
<b>Prerequisites</b>	<p>The following courses are prerequisites to registering for this class:</p> <p>Academic Spoken English I and II Academic Written English I and II Academic English for the Second Year I and II</p>
<b>Recommended prerequisites and preparation</b>	None in particular
<b>Course textbooks and materials</b>	Activities will be based on TED Masterclass on presentations.
<b>Course outline and weekly schedule</b>	<p>In each class, a lesson from TED Masterclass will be studied. The list of lessons appears below. The course also includes issues concerning making research presentations, such as avoiding committing plagiarism.</p> <p>Class 1: Introduction of class / Lesson 1 - What are ideas? Class 2: Lesson 2 - What are your ideas? Class 3: Lesson 3 - What is your throughline? Class 4: Extracting ideas for a presentation from your previous research Class 5: Lesson 4 - Crafting your talk plan Class 6: Lesson 5 - Voice and Presence Class 7: How not to commit plagiarism Class 8: Preliminary presentation (midterm) Class 9: Lesson 6 - Talk Tool: Connection Class 10: Lesson 7 - Talk Tool: Storytelling Class 11: Lesson 8 - Talk Tool: Explanation Class 12: Lesson 9 - Talk Tool: Persuasion Class 13: Lesson 10 - Talk Tool: Revelation Class 14: Lesson 11 - Talk Tool: Visuals Class 15: Final presentation</p>
<b>Course content utilizing practical experience</b>	Thirty-five years of teaching experiences will be utilized in guiding students to attract and maintain attention to one's speeches and to understand the difficulties that the listeners are encountering.

<b>Preparation and review outside class</b>	Review your learning after class by practicing the exercises. Prepare for next class by previewing the activities.
<b>Evaluation and grading</b>	<p>Completion of class activities      30%</p> <p>Midterm presentation                35%</p> <p>Final presentation                    35%</p> <p>-----</p> <p>Total                                        100%</p> <p>S<math>\geq</math>90%, A<math>\geq</math>80%, B<math>\geq</math>70%, C<math>\geq</math>60%, Fail&lt;60%</p>
<b>Office hours</b>	Friday 2nd period, and other times by appointment. Email is always welcome.
<b>Message for students</b>	• What does not kill you makes you stronger. -- This is true.
<b>Others</b>	The contents of this syllabus are subject to change as deemed necessary.
<b>Keyword(s)</b>	Autonomous learning, Presentation skills, Presentation practice

# Reading Scientific Research

## General Information

<b>Course title (Japanese)</b>	Reading Scientific Research		
<b>Course title (English)</b>	Reading Scientific Research		
<b>Course Code</b>	ENG501z		
<b>Academic year</b>	2020	<b>Year offered</b>	3/4
<b>Semester(s) offered</b>	Spring semester	<b>Faculty offering the course</b>	School of Informatics and Engineering
<b>Teaching method</b>	Lecture	<b>Credits</b>	2
<b>Category</b>	General culture subjects		
<b>Cluster/Department</b>	School of Informatics and Engineering		
<b>Lecturer(s)</b>	OOISHI Yukiko (大石 由紀子)		
<b>Office</b>	East 1 – 6 1 5		
<b>e-mail</b>	yukiko@uec.ac.jp		
<b>Course website</b>	WebClass		
<b>Last updated</b>	2020/03/02 17:35:00	<b>Update status</b>	Released

## Course Description

<b>Topic and goals</b>	This class will explore various types of scientific writing to develop students' abilities to understand the role of the articles and logically evaluate their validity and importance. Students will gain an understanding of how various publications and different target audiences determine the style, vocabulary and content of the articles.
<b>Prerequisites</b>	None
<b>Recommended prerequisites and preparation</b>	Academic Written English I & II Academic Spoken English I & II Academic English for the Second Year I/II
<b>Course textbooks and materials</b>	None. All materials will be distributed in class.
<b>Course outline and weekly schedule</b>	Week 1: Class Introduction Week 2: Introduction to reading scientific articles Week 3: Reading scientific articles Week 4: Reading scientific articles Week 5: Audience Week 6: Presentations Week 7: Reading research articles Week 8: Reading research articles Week 9: Presenting general ideas and summaries Week 10: Technical writing Week 11: Literature search Week 12: Writing comparisons Week 13: Writing comparisons Week 14: Presentations & self-evaluations Week 15: Presentations & self-evaluations
<b>Course content utilizing practical experience</b>	
<b>Preparation and review outside class</b>	All assigned readings and other preparation must be done outside of class. Students are expected to spend about one hour each week preparing for the upcoming class, as well as reviewing materials from the previous lesson.
<b>Evaluation and grading</b>	Class Participation (includes attendance, peer-evaluation, self-evaluation) = 35% Presentations = 30% Homework = 35%
<b>Office hours</b>	By appointment.
<b>Message for students</b>	This class will be taught entirely in English.



<b>Others</b>	None
<b>Keyword(s)</b>	reading, discussions, presentations, academic English

# VLSI Low Power Circuit Design

## General Information

<b>Course title (Japanese)</b>	VLSI Low Power Circuit Design		
<b>Course title (English)</b>	VLSI Low Power Circuit Design		
<b>Course Code</b>			
<b>Academic year</b>	2020	<b>Year offered</b>	All years
<b>Semester(s) offered</b>	Spring semester	<b>Faculty offering the course</b>	Master's Program
<b>Teaching method</b>	Lecture	<b>Credits</b>	2
<b>Category</b>	Graduate school core education subjects - Core subjectsI		
<b>Cluster/Department</b>	Department of Communication Engineering and Informatics		
<b>Lecturer(s)</b>	ISHIBASHI Koichiro (石橋 孝一郎)		
<b>Office</b>	W2-306		
<b>e-mail</b>	ishibashi@uec.ac.jp		
<b>Course website</b>	<a href="http://mtm.es.uec.ac.jp/index.html">http://mtm.es.uec.ac.jp/index.html</a>		
<b>Last updated</b>	2020/03/04 17:56:57	<b>Update status</b>	Released

## Course Description

<b>Topic and goals</b>	VLSI低電力回路設計/ VLSI Low Power Circuit Design
<b>Prerequisites</b>	電子回路学/ Fundamental electric circuit theorems
<b>Recommended prerequisites and preparation</b>	電子回路学/ Fundamental electric circuit theorems
<b>Course textbooks and materials</b>	Original lecture materials will be delivered on the class
<b>Course outline and weekly schedule</b>	<p>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.</p> <p>Outline of Class and Contents</p> <ol style="list-style-type: none"> <li>1) Introduction to rolls of VLS I on ICT society</li> <li>2) Structure of MOSFET and its characteristics</li> <li>3) Fundamentals of CMOS LSI circuits</li> <li>4) Power on CMOS LSI</li> <li>5) Moore?s law and Scaling law</li> <li>6) Low power digital circuit design techniques <ul style="list-style-type: none"> <li>- AC power reduction techniques</li> <li>- DC power reduction techniques</li> </ul> </li> <li>7) VLSI Varieties</li> <li>8) Practice of Circuit Simulation</li> </ol> <p>Final exam will be done during the course.</p>
<b>Course content utilizing practical experience</b>	
<b>Preparation and review outside class</b>	Review for the last lecture is recommended before the lectures.
<b>Evaluation and grading</b>	<p>Final exams will be done for evaluation.</p> <p>Evaluation category (Score) are shown as bellow</p> <p>A(=&gt;80), B(=&gt;70), C(=&gt;60), and D(&lt;60)</p>

<b>Office hours</b>	Send e-mail before going to the room of Ishibashi (W2-306)
<b>Message for students</b>	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.
<b>Others</b>	The lecture in this course, type I, is mostly offered in English; PPT slides and handouts are also given in English.
<b>Keyword(s)</b>	VLSI, Low power, Circuit design

# Advanced Communication Engineering and Informatics II (Optical Communication Engineering)

## General Information

<b>Course title (Japanese)</b>	Advanced Communication Engineering and Informatics II (Optical Communication Engineering) (学域)		
<b>Course title (English)</b>	Advanced Communication Engineering and Informatics II (Optical Communication Engineering)		
<b>Course Code</b>	INT002c INT002d INT002f INT002g		
<b>Academic year</b>	2020	<b>Year offered</b>	3/4
<b>Semester(s) offered</b>	Spring semester	<b>Faculty offering the course</b>	School of Informatics and Engineering
<b>Teaching method</b>	Lecture	<b>Credits</b>	2
<b>Category</b>	Core subjects		
<b>Cluster/Department</b>	Cluster I (Informatics and Computer Engineering)/Cluster II (Emerging Multi-interdisciplinary Engineering)		
<b>Lecturer(s)</b>	KISHI Naoto (來住 直人)		
<b>Office</b>	East 3-1027		
<b>e-mail</b>	kishinaoto@uec.ac.jp		
<b>Course website</b>	<a href="http://www.opt.cei.uec.ac.jp/optc/">http://www.opt.cei.uec.ac.jp/optc/</a>		
<b>Last updated</b>	2020/02/20 11:04:53	<b>Update status</b>	Released

## Course Description

<b>Topic and goals</b>	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.
<b>Prerequisites</b>	Physics Introduction (wave and light), Electromagnetism related subjects, Electrical circuit
<b>Recommended prerequisites and preparation</b>	Knowledge of Fourier analysis, Fourier and concept of time- and frequency-domain
<b>Course textbooks and materials</b>	No textbooks needed. All course materials will be provided on-line via the URL listed above. (Password is required to access from off-campus)
<b>Course outline and weekly schedule</b>	<p>The content is as follows,.</p> <ol style="list-style-type: none"> <li>1. Introduction to optical fiber communication.</li> <li>2. Characteristic of light transmission medium of the optical communication and the difference with the low frequency electromagnetic wave.</li> <li>3. Structure of the optical fiber transmission channel and a principle of optical waveguide.</li> <li>4. Important characteristic of the optical fiber, i.e. the linear and non-linear characteristics and the relations with the signal transmission characteristics.</li> <li>5. Principle of basic optical signal source, i.e. photo-generation principle.</li> <li>6. Semiconductor laser light signal source, the light emitting diode structure characteristic and application.</li> <li>7. Single frequency or a multi-wavelength source and pulse light source that specialized in optical communication.</li> <li>8. Theory of optical amplifier in a long-distance optical communication system.</li> <li>9. Characteristic of various optical amplifiers.</li> </ol>

	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.
<b>Course content utilizing practical experience</b>	
<b>Preparation and review outside class</b>	Students are required to review (by accessing to the on-line material and other texts).
<b>Evaluation and grading</b>	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%.
<b>Office hours</b>	Wed (12:30 to 14:30) or after class.
<b>Message for students</b>	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.
<b>Others</b>	For 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 permitted.
<b>Keyword(s)</b>	Telecommunications opticalfibers, dispersion properties, non-linear intensity modulation, direct detection, opticalrepeater, wavelength division multiplexing, laser diode, photo diode, opticalamplifiers, optical network, opticalfiber sensor.

# Advanced Engineering Science I (Modern Optics and Photonics)

## General Information

<b>Course title (Japanese)</b>	Advanced Engineering Science I (Modern Optics and Photonics) (学域)		
<b>Course title (English)</b>	Advanced Engineering Science I (Modern Optics and Photonics)		
<b>Course Code</b>	INT001k INT001m INT001n INT001p		
<b>Academic year</b>	2020	<b>Year offered</b>	3/4
<b>Semester(s) offered</b>	Spring semester	<b>Faculty offering the course</b>	School of Informatics and Engineering
<b>Teaching method</b>	Lecture	<b>Credits</b>	2
<b>Category</b>	Core subjects		
<b>Cluster/Department</b>	Cluster III (Fundamental Science and Engineering)		
<b>Lecturer(s)</b>	TOMITA Yasuo (富田 康生)		
<b>Office</b>	205 West 1		
<b>e-mail</b>	ytomita@uec.ac.jp		
<b>Course website</b>	<a href="http://talbot.es.uec.ac.jp/optics.html">http://talbot.es.uec.ac.jp/optics.html</a>		
<b>Last updated</b>	2020/02/21 11:05:15	<b>Update status</b>	Released

## Course Description

<b>Topic and goals</b>	This is an introductory-level course in the ever-increasing field of modern optics. It includes ray- and wave-descriptions of light propagation and image formation with coherent light. An introduction to holography and optical information processing is also given as an example of parallel and multi-dimensional data handling capabilities of light. Furthermore, it contains discussions of photonic devices (such as lasers, amplifiers, light modulators and detectors) and fiber-optic communications systems.
<b>Prerequisites</b>	A good understanding of introductory electromagnetics and linear systems theory may be helpful.
<b>Recommended prerequisites and preparation</b>	A good understanding of introductory electromagnetics and linear systems theory may be helpful.
<b>Course textbooks and materials</b>	F. Graham Smith and Terry A. King, Optics and Photonics, Wiley, New York, 2000 E. Hecht, Optics, 4th ed., Addison-Wesley, New York, 2001
<b>Course outline and weekly schedule</b>	Topics in 90-minute lectures will include: 1. Preliminaries (Concept of waves and their mathematical expressions) 2. Wave optics 3. Fourier optics 4. Electromagnetic and crystal optics 5. Guided-wave and fiber optics 6. Introduction to fiber-optic communications
<b>Course content utilizing practical experience</b>	
<b>Preparation and review outside class</b>	Reading textbooks and solving homework problem sets
<b>Evaluation and grading</b>	The grades will be based 20% on the homework, 30% on the mid-term exam and 50% on the final exam.
<b>Office hours</b>	Monday 16:00-17:00
<b>Message for students</b>	It is very interesting to learn the ever-increasing field of photonics through this lecture. The knowledge of photonics is very useful to grasp operational principles of many devices and systems around us. These include DVD, laser pointers, fiber optic communication systems etc.
<b>Others</b>	Photonics is the technology of using waves and photons!
<b>Keyword(s)</b>	Wave optics, Diffraction, Interference, Electromagnetic wave, Maxwell equations, Wave polarization, Crystals, Guided-wave and fiber optics

# Introduction to Computational Methods in Science and Engineering

## General Information

<b>Course title (Japanese)</b>	Introduction to Computational Methods in Science and Engineering		
<b>Course title (English)</b>	Introduction to Computational Methods in Science and Engineering		
<b>Course Code</b>	INT505z		
<b>Academic year</b>	2020	<b>Year offered</b>	3/4
<b>Semester(s) offered</b>	Spring semester	<b>Faculty offering the course</b>	School of Informatics and Engineering
<b>Teaching method</b>	Lecture	<b>Credits</b>	2
<b>Category</b>	General culture subjects		
<b>Cluster/Department</b>	School of Informatics and Engineering		
<b>Lecturer(s)</b>	Hans-Georg Matuttis		
<b>Office</b>	E4-721		
<b>e-mail</b>	hg@mce.uec.ac.jp		
<b>Course website</b>	<a href="http://webclass.cdel.uec.ac.jp/">http://webclass.cdel.uec.ac.jp/</a>		
<b>Last updated</b>	2020/03/23 13:02:58	<b>Update status</b>	Released

## Course Description

<b>Topic and goals</b>	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.
<b>Prerequisites</b>	First year Analysis and Linear Algebra, one procedural Programming Language
<b>Recommended prerequisites and preparation</b>	NIL
<b>Course textbooks and materials</b>	Scriptum can be downloaded from <a href="http://webclass.cdel.uec.ac.jp/">http://webclass.cdel.uec.ac.jp/</a> , 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
<b>Course outline and weekly schedule</b>	<ol style="list-style-type: none"> <li>1. Simple MATLAB-Syntax</li> <li>2. How to write better programs</li> <li>3. Non-numerical methods: Monte-Carlo techniques</li> <li>4. Representation of Numbers</li> <li>5. Elementary numerical analysis I: What are numerical errors</li> <li>6. Elementary numerical analysis II: How to get "correct" results from calculations "with error"</li> <li>8. MATLAB Graphics</li> <li>9. Introduction to numerical Linear algebra I: Repetition 1st year Linear Algebra</li> <li>10. Introduction to numerical Linear algebra II: How to draw a line through more than 2 points (or maybe not)</li> <li>11. Introduction to numerical Linear algebra III: Least squared fitting</li> <li>12. Polynomials and Roots</li> <li>13. Solving ordinary differential equations I: Basics Initial conditions, analytic solutions, Euler Method</li> <li>14. Solving ordinary differential equations II: Higher order Methods Approaches to construct higher order methods, Runge-Kutta methods</li> <li>15. Solving ordinary differential equations III: Advanced methods Adaptive Timesteps, energy conservation systems, stiff problems</li> </ol>
<b>Course content utilizing practical experience</b>	
<b>Preparation and review outside class</b>	NIL

<b>Evaluation and grading</b>	Participation in the Lecture and Homework in the E-Learning System Depending on the activity level of the students, Mid-Term and End-Term exams will be held.
<b>Office hours</b>	Friday, second slot, in East-4, Room 721, but if you contact me by E-Mail, other times are possible.
<b>Message for students</b>	Lecture starts after the the introduction to the computer system in the Jusst-Program has been held.
<b>Others</b>	Lecture starts after the the introduction to the computer system in the Jusst-Program has been held.
<b>Keyword(s)</b>	Numerical Analysis, Scientific Programming



# Advanced Theory of Systems Reliability

## General Information

<b>Course title (Japanese)</b>	システム信頼性特論		
<b>Course title (English)</b>	Advanced Theory of Systems Reliability		
<b>Course Code</b>			
<b>Academic year</b>	2020	<b>Year offered</b>	All years
<b>Semester(s) offered</b>	Spring semester	<b>Faculty offering the course</b>	Master's Program, Doctoral Program
<b>Teaching method</b>	Lecture	<b>Credits</b>	2
<b>Category</b>	Graduate school core education subjects - Core subjectsII		
<b>Cluster/Department</b>	Department of Informatics		
<b>Lecturer(s)</b>	JIN Lu (金 路)		
<b>Office</b>	West 5-607		
<b>e-mail</b>	jinlu@inf.uec.ac.jp		
<b>Course website</b>	http://www.rm.inf.uec.ac.jp		
<b>Last updated</b>	2020/03/02 18:12:19	<b>Update status</b>	Released

## Course Description

<b>Topic and goals</b>	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.
<b>Prerequisites</b>	None
<b>Recommended prerequisites and preparation</b>	It would be helpful if the students have a background of probability and statistic.
<b>Course textbooks and materials</b>	No textbooks, just original handout
<b>Course outline and weekly schedule</b>	<p>Course Outline</p> <p>#1: Introduction: Quality Control and Reliability Engineering in Japan</p> <p>#2: Principal Models of Reliability</p> <p>#3: Advanced Models of Reliability</p> <p>#4: System Reliability Design(1)</p> <p>#5: System Reliability Design(2)</p> <p>#6: Reliability Testing and Fault Analysis</p> <p>#7: Reliability Data Analysis (1) Models for Accelerated Life Testing</p> <p>#8: Reliability Data Analysis (2) Hazard Rate Model</p> <p>#9: Preventive Maintenance and Inspection</p> <p>#10: Model and Theory for Maintenance(1) Decision-making and Optimal Maintenance Policy</p> <p>#11: Model and Theory for Maintenance(2) On-line Condition Monitoring</p> <p>#12: Prediction and Prevention of Failures</p> <p>#13: Quality and Reliability Assurance(1)FMEA</p> <p>#14: Quality and Reliability Assurance(2)FTA</p> <p>#15: Quality and Reliability Assurance(3)Group Discussion</p>
<b>Course content utilizing practical experience</b>	
<b>Preparation and review outside class</b>	None
<b>Evaluation and grading</b>	Assessment will be based on the level of understanding
<b>Office hours</b>	After the class
<b>Message for students</b>	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.
<b>Others</b>	This lecture will be given in English.
<b>Keyword(s)</b>	Reliability, Quality Control, Maintenance

# Topics in Informatics II (Sustainable Supply Chain Management)

## General Information

<b>Course title (Japanese)</b>	Topics in Informatics II (Sustainable Supply Chain Management) (学域)		
<b>Course title (English)</b>	Topics in Informatics II (Sustainable Supply Chain Management)		
<b>Course Code</b>	INT002a INT002b INT002e		
<b>Academic year</b>	2020	<b>Year offered</b>	2/3/4
<b>Semester(s) offered</b>	Spring semester	<b>Faculty offering the course</b>	School of Informatics and Engineering
<b>Teaching method</b>	Lecture	<b>Credits</b>	2
<b>Category</b>	Core subjects		
<b>Cluster/Department</b>	Cluster I (Informatics and Computer Engineering)/Cluster II (Emerging Multi-interdisciplinary Engineering)		
<b>Lecturer(s)</b>	YAMADA Tetsuo (山田 哲男)		
<b>Office</b>	Room #507 in Building West 5		
<b>e-mail</b>	tyamada@uec.ac.jp		
<b>Course website</b>	<a href="http://webclass.cdel.uec.ac.jp/webclass/">http://webclass.cdel.uec.ac.jp/webclass/</a>		
<b>Last updated</b>	2020/03/05 14:17:36	<b>Update status</b>	Released

## Course Description

<b>Topic and goals</b>	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. Therefore, 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 emitted 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.
<b>Prerequisites</b>	None
<b>Recommended prerequisites and preparation</b>	Production Management, Operations Research, Introduction to Operations Research
<b>Course textbooks and materials</b>	No textbook, Handouts will be used as a guide for the class.
<b>Course outline and weekly schedule</b>	<ol style="list-style-type: none"> <li>1. Guidance</li> <li>2. Sustainable Manufacturing</li> <li>3. Supply Chain Management</li> <li>4. Global Supply Chain</li> <li>5. Assembly Line System</li> <li>6. Innovation Analysis for Manufactures by Text Mining</li> <li>7. SNS Analysis for Manufactures by Text Mining</li> <li>8. Closed-loop Supply Chain</li> <li>9. Disassembly, Reuse and Recycling</li> <li>10. Low-carbon Supply Chain</li> <li>11. Life Cycle Assessment</li> <li>12. Carbon Tax</li> <li>13. Health Care Systems Engineering</li> <li>14. Work Life Balance</li> <li>15. Summary</li> </ol>

<b>Course content utilizing practical experience</b>	
<b>Preparation and review outside class</b>	Several assignments will be conducted.
<b>Evaluation and grading</b>	Evaluation: Presentations (30%), Activities (40%) and Assignments (30%)
<b>Office hours</b>	Mondays at the 4th class. Make an appointment by e-mail in advance.
<b>Message for students</b>	Let's discuss how to harmonize supply chain and sustainability and enjoy it!
<b>Others</b>	No assignment, No success. This course is taught in English, and Japanese is also added as the need arises.
<b>Keyword(s)</b>	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

<b>Course title (Japanese)</b>	Advanced Engineering Science II (Photonics and Opto-electronics) (学域)		
<b>Course title (English)</b>	Advanced Engineering Science II (Photonics and Opto-electronics)		
<b>Course Code</b>	INT002k INT002m INT002n INT002p		
<b>Academic year</b>	2020	<b>Year offered</b>	3/4
<b>Semester(s) offered</b>	Spring semester	<b>Faculty offering the course</b>	School of Informatics and Engineering
<b>Teaching method</b>	Lecture	<b>Credits</b>	2
<b>Category</b>	Core subjects		
<b>Cluster/Department</b>	Cluster III (Fundamental Science and Engineering)		
<b>Lecturer(s)</b>	UENO Yoshiyasu (上野 芳康)		
<b>Office</b>	Room no. 313, Building no. West-2 (W2-313).		
<b>e-mail</b>	uenoy@ultrafast.ee.uec.ac.jp		
<b>Course website</b>	<a href="http://www.ultrafast.ee.uec.ac.jp/ueno-classes.html">http://www.ultrafast.ee.uec.ac.jp/ueno-classes.html</a>		
<b>Last updated</b>	2020/03/16 18:16:14	<b>Update status</b>	Released

## Course Description

<b>Topic and goals</b>	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.
<b>Prerequisites</b>	fundamentals of electro-magnetic waves (propagating in speed of light). fundamentals of electronics such as basic diodes and transistors.
<b>Recommended prerequisites and preparation</b>	fundamentals of quantum mechanics (particles and waves). fundamentals of crystalline materials and their basic, electronic properties.
<b>Course textbooks and materials</b>	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.
<b>Course outline and weekly schedule</b>	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

	<p>electronic energy.</p> <p>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&amp;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.)</p>
<b>Course content utilizing practical experience</b>	
<b>Preparation and review outside class</b>	Both personal and group studies, efficiently before and after each weekly classroom, are encouraged.
<b>Evaluation and grading</b>	Understanding level of each student is evaluated, in the final test in the end of the 15-week course.
<b>Office hours</b>	6th period, Tuesdays. (Notify me Ueno by email, when I was not available in the period of tuesday.)
<b>Message for students</b>	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.
<b>Others</b>	Lecturer Ueno's international activities: <a href="http://www.ultrafast.ee.uec.ac.jp/ueno-cv.html">http://www.ultrafast.ee.uec.ac.jp/ueno-cv.html</a>
<b>Keyword(s)</b>	photonics, opto-electronics, quantum mechanics, electro-magnetic waves, light-emitting diodes (spontaneous emission), lasers (stimulated emission), optical sensors, solar batteries, silicon, gallium arsenide, semiconductor.

# Exercises in Advanced Computational Science

## General Information

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

## Course Description

<b>Topic and goals</b>	<p>[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.</p> <p>[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</p>
<b>Prerequisites</b>	Computer Literacy, Fundamental Programming
<b>Recommended prerequisites and preparation</b>	Numerical Analysis, Computer Programming and Applications, Numerical Calculus for Science and Engineering
<b>Course textbooks and materials</b>	NIL
<b>Course outline and weekly schedule</b>	<p>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.</p> <ol style="list-style-type: none"> <li>1. Guidance</li> <li>2. Assignment 1</li> <li>3. Assignment 2</li> <li>4. Assignment 3</li> <li>5. Assignment 4</li> <li>6. General Meeting</li> <li>7. Assignment 5</li> </ol>

	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.
<b>Course content utilizing practical experience</b>	
<b>Preparation and review outside class</b>	Consult with the instructor for more information.
<b>Evaluation and grading</b>	Comprehensively evaluate by 1) the assignment's setting, performance and the examine of the results, and 2) the final presentation.
<b>Office hours</b>	Consult with the instructor
<b>Message for students</b>	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.
<b>Others</b>	NIL
<b>Keyword(s)</b>	Exercises in Advanced Computational Science



# Information and Communications Technologies for SDGs

## General Information

<b>Course title (Japanese)</b>	SDGsを支える情報通信論		
<b>Course title (English)</b>	Information and Communications Technologies for SDGs		
<b>Course Code</b>			
<b>Academic year</b>	2020	<b>Year offered</b>	All years
<b>Semester(s) offered</b>	Spring semester	<b>Faculty offering the course</b>	Master's Program, Doctoral Program
<b>Teaching method</b>	Lecture	<b>Credits</b>	2
<b>Category</b>	Graduate school practical education subjects		
<b>Cluster/Department</b>	Offered for all departments		
<b>Lecturer(s)</b>	ISHIBASHI Koichiro (石橋 孝一郎), MATSUURA Motoharu (松浦 基晴)		
<b>Office</b>	East 3-1028, East 3-1027(Matsuura)		
<b>e-mail</b>	m.matsuura@uec.ac.jp		
<b>Course website</b>	None		
<b>Last updated</b>	2020/03/28 17:51:36	<b>Update status</b>	Released

## Course Description

<b>Topic and goals</b>	<p>[Topic] 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 under developing 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.</p> <p>[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 Study the case 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.</p>
<b>Prerequisites</b>	None
<b>Recommended prerequisites and preparation</b>	None
<b>Course textbooks and materials</b>	None
<b>Course outline and weekly schedule</b>	<p>This course is &lt;English Type II&gt;, and lectures are given in Japanese or English using English materials. The language for lecture depends on the teacher in charge.</p> <p>#1 "Introduction, BHN activities and SDGs", Prof. NISHINO Tetsuro, Lecturer TOMINO Takeshi (BHN) #2 "The ICT function towards the realization of SDGs", Lecturer KANO Sadahiko (Emer. Prof. of Waseda University) #3 "Energy the key issues to achieving the SDGs", Emer. Prof. ICHIKAWA Haruhisa #4 "ICT policy for realizing SDGs", Lecturer SAKAMOTO Yasuo (NTT Docomo) #5 "ICT the key issues to achieving the SDGs", Lecturer HARADA Yonosuke (Emer. Prof. of Institute of Information Security) #6 "The application of ICT for achieving SDGs: Medical field", Lecturer KUREMATSU Hachihei (BHN)</p>

	<p>#7 “The application of ICT for achieving SDGs: Welfare area”, Prof. YOKOI Hiroshi</p> <p>#8 “The application of ICT for achieving SDGs: Regional revitalization”, Lecturer KOBAYASHI Tadao (IEEE802.11ah Promotion Council, President)</p> <p>#9-10 Technical Tour: See below for the details</p> <p>#11 “The application of ICT for achieving SDGs: Disaster prevention and Mitigation”, Lecture, ARIMA Shuji (BHN)</p> <p>#12 “The application of ICT for achieving SDGs: Global environment”, Lecturer NAKAMURA Kenji (Prof. of Dokkyo University)</p> <p>#13 “The application of ICT for achieving SDGs: Agriculture and fishery Area”, Prof. ISHIBASHI Koichiro</p> <p>#14-15 Exercises: See below for the details</p> <p>[ Technical Tour ]</p> <p>A course: one-day bus tour</p> <p>1.Tohto University-Makuhari campus (Chiba City): Training site inspection for human resources (physical therapists) supporting medical, health, preventive, and welfare services</p> <p>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.</p> <p>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</p> <p>B course: one-day bus tour (Yamanashi prefecture: Kofu City, Chuo City, Kosu City)</p> <p>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.)</p> <p>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</p> <p>3. JA Fruit Yamanashi (Kosu 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.</p> <p>[ Exercises ]</p> <p>Perform a presentation regarding your ideas, thought and/or proposals for solving problems in your hometown (country) applying ICT, referring to what you learned in lectures and technical tours.</p>
<b>Course content utilizing practical experience</b>	The faculty members in charge of this subject have made practical results in joint research with companies on the theme they are in charge of. In addition, part-time lecturers are experienced in practical work for long time on the subject in charge. Since it is provided in an omnibus format by these members, it is a very practical course content.
<b>Preparation and review outside class</b>	Since homework will be given during class, review and prepare reports
<b>Evaluation and grading</b>	<p>Evaluation criteria</p> <p>The level of understanding of learning achievement goals ① and ② and the attitude toward learning achievement goal ③ based on the following criteria.</p> <p>Evaluation criteria:</p> <p>A (80-100 points): It is recognized that the achievements of ① and ② are sufficient, and the ability of ③ has been fully developed.</p> <p>B (70-79 points): It is recognized most of ① and ② are achieved, and it is recognized that the ability of ③ has been cultivated.</p> <p>C (60-69 points): It is recognized most of ① and ② are achieved fairly, and it is recognized that the ability of ③ has been cultivated to some extent.</p> <p>D (59 points or less, rejected): Goals ① and ② are not fully achieved and the ability of</p>

	③ is not cultivated.
<b>Office hours</b>	Take appointments by email in advance.
<b>Message for students</b>	This course has two technical tours by bus. Participate at least once.
<b>Others</b>	None
<b>Keyword(s)</b>	SDGs, ICT, Information security, Energy, Medical welfare, Disaster prevention, Global environment

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

## General Information

<b>Course title (Japanese)</b>	情報通信ネットワーク		
<b>Course title (English)</b>	Information and Communication Networks		
<b>Course Code</b>			
<b>Academic year</b>	2020	<b>Year offered</b>	All years
<b>Semester(s) offered</b>	Spring semester	<b>Faculty offering the course</b>	Master's Program
<b>Teaching method</b>	Lecture	<b>Credits</b>	2
<b>Category</b>	Graduate school core education subjects - Core subjectsI		
<b>Cluster/Department</b>	Department of Communication Engineering and Informatics		
<b>Lecturer(s)</b>	OKI Eiji (大木 英司)		
<b>Office</b>			
<b>e-mail</b>	oki@i.kyoto-u.ac.jp		
<b>Course website</b>	<a href="http://icn.cce.i.kyoto-u.ac.jp/member/profile02">http://icn.cce.i.kyoto-u.ac.jp/member/profile02</a>		
<b>Last updated</b>	2020/02/22 0:12:09	<b>Update status</b>	Released

## Course Description

<b>Topic and goals</b>	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.
<b>Prerequisites</b>	The minimum requirement to understand this course is a knowledge of linear algebra and computer logic.
<b>Recommended prerequisites and preparation</b>	Undergraduate courses related to information, communications, networks, probability and statistics, and mathematical programming.
<b>Course textbooks and materials</b>	<p>Book 1: Textbook, E. Oki, Linear Programming and Algorithms for Communication Networks, CRC Press, Boca Raton, 2012.</p> <p>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.</p> <p>The contents of this course are almost covered by Book 1.</p>
<b>Course outline and weekly schedule</b>	<p>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.</p> <ol style="list-style-type: none"> <li>1. Introduction and Basic problems for communication networks</li> <li>2. Algorithms for basic problems (Shortest path routing max flow problem)</li> <li>3. Algorithms for basic problems (Minimum-cost flow problem)</li> <li>4. Disjoint path routing</li> <li>5. Liner programming basics</li> <li>6. Application of liner programming</li> <li>7. Mid-term exercise/examination</li> <li>8. GLPK (GNU Liner Programming Kit)</li> <li>9. Basic problems solved by LP</li> <li>10. Disjoint path routing and wavelength assignment solved by LP</li> <li>11. Routing and traffic demand model (basics)</li> <li>12. Routing and traffic demand model (hose models and others)</li> <li>13. Mathematical puzzles</li> <li>14. Advanced mathematical puzzles</li> <li>15. Advanced topics</li> </ol>

<b>Course content utilizing practical experience</b>	
<b>Preparation and review outside class</b>	As preparation, read the corresponding chapter of the textbook.
<b>Evaluation and grading</b>	<p>Methods: Homework, and mid-term and final examinations</p> <p>Criteria: Fundamentals and theories (50%) Practices (50%)</p>
<b>Office hours</b>	After lecture. Others make an appointment by email.
<b>Message for students</b>	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.
<b>Others</b>	None.
<b>Keyword(s)</b>	Information and communication, communication network, design and control, mathematical programming, algorithm

