情報画像セミナー Introduction to Information and Image sciences

[Instructor] Department of Information Processing and Computer Sciences of each teacher
[Credits] 2
[Semester] 1st year-Spring Wed 2
[Course code] T1U001001
[Room] Bldg. Eng.2-102
(Bldg. ENG-2 cannot be used during 2014 fall semester.)
[Course description] Practical Training
[Candidate] 1st year Department of Informatics and Imaging Systems and Transfer Students
[Course description] This is an orientation course for new students about study and research at the university, life in the university and carrier by communicating with the teaching staff and peer students in person.
[Course objectives] To help new students to get overview on Department of Informatics and Imaging Systems
And motivate them to design their future.
[Plans and Contents] There will be 5 students in one group to one faculty staff, they will communicate with each other frankly and exchange opinions and information. Specific activities are provided by each staff. The theme is vary, such as students' participation for study, characteristics in Department of Informatics and Imaging Systems courses and its classes, research and study for graduation, careers in graduate courses, introduction to each field of laboratory and their future careers. Students are encouraged to help improve and enlighten each other through discussion with the teaching staff and within the group.
[Keywords] Small Group Seminar, Orientation
[Textbooks and Reference Books] None in particular。
Where necessary, reference materials and printouts for discussion purposes shall be distributed and information compiled by students shall be used within the group.
[Evaluation] Attendance
[Course requirements] None in particular。
[Remarks] Guidance will be carried out during the first lesson to be held over two periods on 4/18 at Bldg-ENG.9-106.

情報画像概論 Introduction to Information & Image Sciences

[Instructor] Shingo Kuroiwa

[Credits] 2

[Semester] 1st year-Fall Wed 4

[Course code] T1U002001

[Room] Bldg. Eng. 2-103

(Bldg. ENG-2 cannot be used during 2014 fall semester.)

[Course enrollment] 85

[Candidate] 1st year department of Informatics and Imaging Systems

Compulsory (Past fiscal year student,Transferred Students,Other department students are taking T1U002002)

[Course description] For basic knowledge in study of information science, information mathematics, digital signals, image and audio processing, computer hardware and software, information technology ethics will be lectured. As well as presentation and discussion skill.

[Course objectives] To understand the information science and image science with the 3 main subjects; "1. Information and Mathematics","2. Information and human being","3. Information and Physics" cultivate ability to do representation and examine as an engineer. To obtain high standard ethics and moral for information science engineers. Objectives are: Knowledge and understanding：binary numbers, digital expression of numeric, strings, audio and visual, computer architecture. Way of thinking : High standard ethics and moral for information science engineers. Motivation : interest in how and why of information technology. Collect information of new technology. Participation : report on deadline. Investigation and presentation as a team. Skill and expression：explain to others about information science.

[Plans and Contents] Schedule for lecture and Practical Training as follows. Power point can be downloaded on the weekend before the class week for preparation

1.How to study "engineering"

2. Binary numbers and digital signals (1); Binary and hexadecimal representation of integers

3. Binary numbers and digital signals (2); Binary and hexadecimal representation of real numbers and IEEE754 floating point representation

4. Digital representation of sounds and images (1); How to acquire analog signals with a computer

5. Digital representation of sounds and images (2); Digital representation of images

6. Digital representation of sounds and images (3); Digital representation of sounds

7. Logic circuit (1); Logic operation and combination logic circuits

8. Logic circuit (2); Sequential circuit and timing chart

9. Basic configuration of a computer (1); CPU and main storage

10. Basic configuration of a computer (2); File systems and peripheral equipment

11. Software and algorithms'; Operating System and programming (winter vacation homework)

12. Network and security; Internet security and personal information protection and copyrights

13. The end -of term exam

14. Presentation seminar1; Survey familiar technologies and use presentation tools such as PowerPoint etc. to make presentation for each lesson.

15. Presentation seminar2; Survey familiar technologies and use presentation tools such as PowerPoint etc. to make presentation for each lesson.

16. Presentation seminar3; Survey familiar technologies and use presentation tools such as PowerPoint etc. to make presentation for each lesson.

[Keywords] binary numbers, digital signal processing, computer, software, network, information ethics

[Textbooks and Reference Books] text book: ：Azuma Oouchi, et.al, Introduction to informatics University Lecture: Information Science and Literacy in Information Society

[Evaluation] The end of the term exam on 15th week and participation （small tests for bonus and deduction, nonattendance for deduction）, reports (quality and deadline for bonus and deduction）, presentation（bonus）evaluated. students weigh total score less 60 will be unaccredited in the end term Exam.

[Related courses] Acquire knowledge necessary in many specialist courses for 2nd year students and beyond

[Course requirements] Acquire sufficient knowledge on “Information A/B/C” in senior high school and “Numerical Calculations & Computers” in “Mathematics B”.

[Remarks] Over 11times of attendance will be precondition to archive a credit

情報画像概論　Introduction to Information & Image Sciences

[Instructor] Shingo Kuroiwa

[Credits] 2

[Semester] 1st year-FallWed 5

[Course code] T1U002002

[Room] Bldg Eng. 2-103

(Bldg. ENG-2 cannot be used during 2014 fall semester.)

[Course enrollment] 60

[Candidate] Students in other departments, students of repeating a course, students of past fiscal year, or transfer students (1st year of students of Department of Informatics and Imaging System have to take T1U002001)

[Course description] For basic knowledge in study of information image sciences information mathematics, digital signals, computer hardware and software will be lectured Introduction to information society and the influence, information technology ethics or moral to keep up on their own study. Presentation and discussion to fully understand the information society.

[Course objectives] To understand the information image science with the 3 main subjects;“1. Information and Mathematics”,“2. Information and human being”,“3. Information and Physics” cultivate ability to do representation and examine as an engineer. To obtain high standard ethics and moral for information science engineers. Objectives are: Knowledge and understanding： binary numbers, digital expression of numeric, strings, audio and visual, computer architecture. Way of thinking High standard ethics and moral for information science engineers. Way of collecting information of new technology. Participation：report on deadline.

[Plans and Contents] Schedule for lecture and Practical Training as follows. Power point can be downloaded on the weekend before the class week for preparation.

1. How to study “engineering”
2. Binary numbers and digital signals (1)
3. Binary numbers and digital signals (2)
4. Digital representation of sounds and images (1)
5. Digital representation of sounds and images (2)
6. Digital representation of sounds and images (3)
7. Logic circuit (1)
8. 2 – 7 general seminars
9. Logic circuit (2)
10. Basic configuration of computers (1)
11. Basic configuration of computers (2)
12. 2 – 11general seminars
13. Software and algorithms
14. Network and security
15. 2 – 14general seminars

[Keywords] binary numbers, digital signal processing, computer, software, network, information ethics

[Textbooks and Reference Books] text book: ：Azuma Oouchi, et.al, Introduction to informatics University Lecture: Information Science and Literacy in Information Society

[Evaluation]

Overall evaluation to be based on the “mid-term test” held during the 12th lecture and the “end-of-term exam” held during the 15th lecture with a 4:6 weighting. Normal points (points to be added/deducted based on the mini-tests and deductions to

be made for non-attendance and late attendances) and reports (points to be added/deducted based on the contents and deductions to be made for non-submission) shall be taken into consideration.

[Related courses] Acquire knowledge necessary in many specialist courses for 2nd year students and beyond

[Course requirements] Students must have studied "Information A/B/C" and" Numerical calculation and Computer" in "Mathematics B".

[Remarks] Over 11times of attendance will be precondition to archive a credit.

The passer of Fundamental Information Technology Engineer Examination (FE), please talk with the instructor.

情報画像リテラシー Computer Literacy for Information and Image Sciences

[Instructor] Takashi Imaizumi

[Credits] 2

[Semester] 1st year-Fall Tue 2

[Course code] T1U004001

[Room] Bldg GNE. A4F Information Processing Seminar Room 2

[Course enrollment] 50

[Course description] Learn about spreadsheet software to use and have good command of computer as a tool. Prepare for programming and learn about C language programming

[Course objectives]Your computer does not automatically performs necessary calculation for you, the user must designate how to calculate. As a software for this purpose, we will learn about spreadsheet software, how to designate to calculate complicated process. Also learn C language structure sentences for basic programmingability. Third semester course ”Program Design and Realization” along with this course enables you to understand basic of C language programming throughly.

[Plans and Contents] First half for spreadsheet software, latter half for C language.

1. Guidance
2. Spreadsheet software (1)
3. Spreadsheet software (2)
4. Spreadsheet software (3)
5. Spreadsheet software (4)
6. Spreadsheet software (5)
7. Spreadsheet software (6)
8. Programming
9. Editor and programming environment
10. Basics of C Language
11. Variables, model
12. Control structure (1)
13. Control structure (2)
14. Array
15. The end of term exam

[Keywords] Spreadsheet software, C Language, Programming

[Textbooks and Reference Books] Textbook: 「Meikai C Language」、Softbank Publishing, Bouyou SHIBATA, 2,200 Yen, ISBN4-7973-2792-8

[Evaluation] Evaluation is given by assignment of the seminar in the Lecture、Homeworks, and the end of term exam.

[Course requirements] Students must have taken courses of Information Processing.

情報画像リテラシ- Computer Literacy for Information and Image Sciences

[Instructor]Takashi Imaizumi

[Credits] 2

[Semester] 1st year-Fall Tue 4

[Course code] T1U004002

[Room] Bldg GNE. A4F Information Processing Seminar Room 2

[Course enrollment] 50

[Course description] Learn about spreadsheet software to use and have good command of computer as a tool. Prepare for programming and learn about C language programming

[Course objectives]Your computer does not automatically performs necessary calculation for you, the user must designate how to calculate. As a software for this purpose, we will learn about spreadsheet software, how to designate to calculate complicated process. Also learn C language structure sentences for basic programmingability. Third semester course ”Program Design and Realization” along with this course enables you to understand basic of C language programming throughly.

[Plans and Contents] First half for spreadsheet software, latter half for C language.

1. Guidance
2. Spreadsheet software (1)
3. Spreadsheet software (2)
4. Spreadsheet software (3)
5. Spreadsheet software (4)
6. Spreadsheet software (5)
7. Spreadsheet software (6)
8. Programming
9. Editor and programming environment
10. Basics of C Language
11. Variables, model
12. Control structure (1)
13. Control structure (2)
14. Array
15. The end of term exam

[Keywords] Spreadsheet software, C Language, Programming

[Textbooks and Reference Books] Textbook: 「Meikai C Language」、Softbank Publishing, Bouyou SHIBATA, 2,200 Yen, ISBN4-7973-2792-8

[Evaluation] Evaluation is given by assignment of the seminar in the Lecture、Homeworks, and the end of term exam.

[Course requirements] Students must have taken courses of Information Processing.

情報数学 I　Mathematics for Information Science I

[Instructor] Kishimoto Wataru

[Credit]:2

[Semester] 2nd year-Spring-Fri 4

[Course code]T1U005001

[Room] Bldg.Eng.2-103

(Bldg. ENG-2 cannot be used during 2014 fall semester.)

[Candidate] Compulsory course for 2nd year of Department of Informatics and Imaging Systems

[Course description] Lecture and practical training in fundamental mathematics for students in information and image science, and fundamental mathematics（discrete mathematics, algebra）for computer science and related matters.

[Course objectives]　To study fundamental mathematics for computer science（discrete mathematics, algebra）and related matters and basic knowledge of set, relations, elementary number theory, and algebra.

[Plans and Contents]

1. Set
2. Set operations
3. Mapping
4. Equivalence relation
5. Order relation
6. Propositional logic
7. Predicate logic
8. Summary of set, mapping, relation, logic
9. Combination
10. Properties of integers
11. Congruences
12. Congruence equation
13. Algebraic system and group
14. Ring and Field
15. Overall summary

[Keywords] Mathematics for information science, Set, Relation, Logic, Elementary number theory, Algebra、

[Textbooks and Reference Books] Textbook：“IT Text Risansugaku，Matsubara et.al.，Ohmsha,

[Evaluation]8th or 9th class for midterm, 15th class end-term-exam. By these two and small test, mid: end: small test=approx. 4：4：2

[Related courses] Students have preferably taken course of Mathematics for Information Science I prior to taking Mathematics for Information ScienceⅡ.

[Course requirements] None in particular

[Remarks] Note that students enrolled from 2004 to 2007 who are taking both Mathematics for Information Science I and Mathematics for Information II courses can only use one of them as credits required for graduation.

計算機システム入門 Introduction to Computer Systems

[Instructor] Yoshitsugu Manabe

[Credits] 2

[Semester] 2nd year-Spring-Thu 1

[Course code] T1U006001

[Room] Bldg.Eng. 2-103

(Bldg. ENG-2 cannot be used during 2014 fall semester.)

[Course enrollment] 100

[Candidate]Students of faculty of Engineering, other Faculties, and Specially Registered Non-Degree Student.; Department of Informatics and Imaging Systems 2nd year Compulsory

[Course description] To understand computing system's basic structure and operation, this lecture explains expression principles of numbers and signs, computer's basic structure, commands and assembly language, assembler operation and basical calculation circuit. Students are encouraged to learn on their own and expected to prepare for class using textbook and material on website. Through answering questions in class and doing exercises help to learn and deeper understand the subject.

[Course objectives] The purpose of this lecture is to understand electronic computing system's basic principle, structure and operation. Today electronic computing systems have been built in internet, home appliances, mobile device, automobile, industrial machinery, airplane and so on. Engineers for all electronic computing system must understand basic principle, structure and operation. Basic items are lectured in this class.

[Plans and Contents] Scheduled as in below, exercises will be conducted in class.

1. Structure and operations of computer systems, logical structure of computers, history of computers
2. Representation of integers Representation theory of numbers and symbols,
3. Representation of numbers including decimal point, floating decimal point representation.
4. Basic operations of computers, overview of COMET, overview of COMET commands
5. Assembly language CASL, type and format of command and Operation overview of assembler
6. Classification of computer circuits, Boolean algebra, basic operations and logic functions
7. Representation method of logic functions
8. Overall summary of 1st – 7th lecture contents
9. Simplification of logic functions
10. Combinational circuit
11. Operational circuits
12. Memory circuit, semi-conductor memory, Flip-Flop circuit
13. Concept of sequencial circuit
14. Composition of sequencial circuit
15. Overall summary of 9th – 14th lectures

[Keywords] Computer system, Number, Character, Sign, Commands, Assmbler, Operational circuit, Memory circuit, Sequencial circuit

[Textbooks and Reference Books] Hideo Ito and Tadashi Kurata: Introduction to Computer Systems, Asakura Publishing Co.Ltd.

[Evaluation]

Evaluation to be based on mini-tests conducted during each lesson (30%), interim exam conducted during the 8th lecture (35%), end-of-term exam conducted during the 15th lecture (35%), making a total of 100%.

[Related courses] This lecture is basis for learning computer structure or operation and digital processing (logical circuit) such as computer hardware, computerarchitecture, program language structure, digital signal processing, and operating system.

[Remarks] Over 11times of attendance will be precondition to archive a credit.

プログラムの設計と実現 I　Design and Implementation of Computer Programs I

[Instructor] Yasuo Horiuchi

[Credits] 2

[Semester] 2nd year-Spring-Thu 2

[Course code]T1U007001

[Room] Bldg Eng 2-103

(Bldg. ENG-2 cannot be used during 2014 fall semester.)

[Course enrollment] 120

[Course description] Learn basics of computer programming with C language and algorithm design. This class is a requirement for Information Image Science major students, and this class will be necessary for the future studies using programming. For Image Science students this is not a requirement, still this class helps learn basics of programming and C language programming.

[Course objectives] That student may write a simple program in C language. It is essential to learn the basics of programming when using computers in future studies. Procedural language is ideal for learning basics of algorithm design. First for basic programming knowledge, there will be (1) variable (2) conditional brunch (3) loop (4) array (5) function to learn the basics of algorithm design, which is followed by, requirement for practical C language programming (6) strings (7) pointer (8) recursive programming (9) structure (10) file input and output and (11) modularization for large-scale programming (12) List structure by self-referential structure using pointer

[Plans and Contents] Prior "Computer Literacy for Information and Image Sciences" has an introduction to C language; this class reviews the basic programming, and then learns basic programming method of C language and advanced method. In this class, students will acquire necessary programming for future study, along with "Computer Programming Practice" also in this semester with advanced exercises. Exercise material will be on WWW.

1. Variable, operator, type, conditional branch and loop
2. Array
3. Function
4. Basic type and recursion
5. Character and string
6. Pointer
7. Pointer and string
8. Command-line argument
9. Structure
10. File input and output
11. Module programming
12. Self-referential structure and list
13. Array of pointers
14. Review
15. Summary and end-of-term exam

[Keywords] Programming，C Language，Algorithm，Data Structure

[Textbooks and Reference Books]

"Meikai C Gengo Introcuctory Edition", Softbank. Use other reference books depending on your own skills and preferences since there are many books on the C language that are in publication. For those who would like to gain an in-depth understanding of the C language, they may also refer to the book "The C Programming Language 2nd Edition", Brian W. Kernighan and Dennis M. Ritchie

[Evaluation] Evaluation will be given based on Attendance, Seminar assignment Homework、The end-of term exam

[Related courses] "Computer Literacy for Information and Image Sciences" has introduction to C language, "Computer

Programming Practice" has actual exercises on computer, after which there will be experiment with C language programming

[Course requirements] Students must have taken courses of Computer Literacy for Information and Image Sciences.

[Remarks] Questions and opinions may be raised during the lectures and questions are also welcome anytime after lectures and during office hours.

フーリエ変換と画像 Fourier Transform for Information and Image Sciences

[Instructor] Takahiko Horiuchi

[Credits] 2

[Semester] 2nd year-Spring-Tue 2

[Course code] T1U008001

[Room] Bldg.Eng.17-113

[Course enrollment] No Limited

[Candidate]Students of faculty of Engineering, other Faculties, and Specially Registered Non-Degree Student .

[Course description] After the explanation on basic mathematics and signal processing model, there will be lecture of Fourier series expansion, Fourier transform, discrete Fourier transform, FFT, two-dimensional Fourier transform or filtering in relation to images, with exercises for every class. There will be answers and explanation of exercises the next week, so students are encouraged to study unsolved exercises before the next class.

[Course objectives] That students will understand Fourier transform's basic disposition, necessary in information image engineering like digital image processing or optics in image science, and will learn its relationship to images; such as (1) Understand principles of Fourier series expansion and solve basic numerical calculation problem (2) Understand principles of Fourier transform and discrete Fourier transform and solve basic numerical calculation problem (3) understand relationship to FFT, AD/DA conversion, Shannon's sampling theorem necessary when applying to engineering (4) Extend understanding of Fourier transform to two-dimensional signals, explain the significance in Image Engineering or Image Science. Students are encouraged to review each Practical Training in previous classes to do self-evaluation of achievements before examination.

[Plans and Contents]

1. General remarks
2. Fourier series
3. Fourier expansion
4. Vector form of Fourier series and expansion
5. Complex form of Fourier series and expansion
6. 1D Fourier transform (1)
7. 1D Fourier transform (2)
8. Discrete Fourier transform (1)
9. Discrete Fourier transform (2)
10. Fast Fourier transform
11. AD, DA conversion and sampling theorem
12. 2D Fourier transform
13. Fourier transform for information and image sciences (1)
14. Fourier transform for information and image sciences (2)
15. Summary and The end of term exam

[Textbooks and Reference Books] Textbook is not specified. Handout will be given with the process of class on appropriate time. Select your own reference books depending on your own personal level of understanding since there are many books on Fourier transformation at different levels that are in publication.

[Evaluation] Exercises in every class (50%)and examination at the end of the term (50%). If average point for the exercises exceeds 80％, then examination at the end of the term may be exempted in some cases.

[Related courses] This study is important for many studies, especially the following; "micro-magnetic waves and light" "information theory" "digital signal processing" "digital image processing" "visual information processing" "circuit theory II" "oscillation and waves"

[Remarks] The lecture will be given for the student who has student ID number with even number

フーリエ変換と画像 Fourier Transform for Information and Image Sciences
[Instructor] Takahiko Horiuchi
[Credits] 2
[Semester] 2nd year-Spring-Tue 3
[Course code] T1U008002
[Room] Bldg.Eng. 17-113
[Course enrollment] No Limited
[Candidate]Students of faculty of Engineering, other Faculties, and Specially Registered Non-Degree Student .
[Course description] After the explanation on basic mathematics and signal processing model, there will be lecture of Fourier series expansion Fourier transform, discrete Fourier transform, FFT, two-dimensional Fourier transform or filtering in relation to images, with exercises for every class. There will be answers and explanation of exercises the next week, so students are encouraged to study unsolved exercises before the next class.
[Course objectives] That students will understand Fourier transform's basic disposition, necessary in information image engineering like digital image processing or optics in image science, and will learn its relationship to images; such as (1) Understand principles of Fourier series expansion and solve basic numerical calculation problem (2) Understand principles of Fourier transform and discrete Fourier transform and solve basic numerical calculation problem (3) understand relationship to FFT, AD/DA conversion, Shannon's sampling theorem necessary when applying to engineering (4) Extend understanding of Fourier transform to two-dimensional signals, explain the significance in Image Engineering or Image Science. Students are encouraged to review each Practical Training in previous classes to do self-evaluation of achievements before examination.
[Plans and Contents]
1. General remarks
2. Fourier series
3. Fourier expansion
4. Vector form of Fourier series and expansion
5. Complex form of Fourier series and expansion
6. 1D Fourier transform (1)
7. 1D Fourier transform (2)
8. Discrete Fourier transform (1)
9. Discrete Fourier transform (2)
10. Fast Fourier transform
11. AD, DA conversion and sampling theorem
12. 2D Fourier transform
13. Fourier transform for information and image sciences (1)
14. Fourier transform for information and image sciences (2)
15. Summary and The end of term exam

[Textbooks and Reference Books] Textbook is not specified. Handout will be given with the process of class on appropriate time. Select your own reference books depending on your own personal level of understanding since there are many books on Fourier transformation at different levels that are in publication.

[Evaluation] Exercises in every class (50%)and examination at the end of the term (50%). If average point for the exercises exceeds 80%, then examination at the end of the term may be exempted in some cases.
[Related courses] This study is important for many studies, especially the following; "micro-magnetic waves and light" "information theory" "digital signal processing" "digital image processing" "visual information processing" "circuit theory II" "oscillation and waves"
[Remarks] The lecture will be given for the student who has student ID number with uneven number

回路理論 I Electric Circuit Theory I

[Instructor] Hiroo Sakiya
[Credits] 2
[Semester] 2nd year-Spring Thu 4
[Course code] T1U009001
[Room] Bldg.Eng.2-113
(Bldg. ENG-2 cannot be used during 2014 fall semester.)

[Candidate] Students of faculty of Engineering, other Faculties, and Specially Registered Non-Degree Student

[Course description] This course gives fundamental circuit theory with a keyword of “Electric circuits are the language for engineering,”. Practical training for every week helps understanding the lecture topics.

[Course objectives] The purpose of this lecture is to understand basic theory of electric circuit as well as graph theory, differential equation, and filter theory through the practical training. Characteristics of fundamental circuit elements, which are voltage and current sources, resistance, capacitor, and inductance, and formulate circuit equations can be understood. Additionally, the filter theory through the Phaser’s method, which is a steady-state analysis also, can be understood.

[Plans and Contents] I talk students to be understood within the class. Practical training may be needed with extra hours. Office hour supports students with the questions.

1. Introduction “Electric circuits are the language of engineering”
2. Properties of circuit elements (1) Resistance, voltage source, power source
3. Properties of circuit elements (2) Power conversion, capacitor
4. Properties of circuit elements (3) Inductance
5. Circuit equation (1) Nodal equation and loop equation
6. Circuit equation (2) Loop equation and cut-off equation
7. Circuit equation (3) Dual circuit
8. Properties of basic circuits (1) Circuit expression using differential equations
9. Properties of basic circuits (2) Solution of linear differential equations
10. Properties of basic circuits (3) Circuits expressed by a one-dimensional differential equation
11. Properties of basic circuits (4) Circuits expressed by a two-dimensional differential equation
12. Analysis of sine wave steady state (1) Impedance and admittance
13. Analysis of sine wave steady state (2) Sine wave voltage, effect value of current
14. Analysis of sine wave steady state (3) Resonance filter and frequency response
15. Analysis of sine wave steady state (4) Low pass filter
16. Exam

[Keywords] Electric circuit, circuit element, direct current analysis, interchange analysis, circuit equation, ordinary differential equation, filter

[Textbooks and Reference Books] Same as above (this is most suitable as a seminar book for these lectures even though it is not used during the lectures). Select other reference books that you can easily understand on your own since these are readily available.

[Evaluation] Seminar is conducted each week. Exams will also be conducted and evaluation shall be based 1/3 on the seminars and 2/3 on the exams.

[Related courses] Electric Circuit TheoryII, Differential Equations, Fourier Transform for Information and Image Sciences, Information and Image Science Lab I

[Course requirements] None in particular.

[Remarks] This course is an introductory lecture to electric circuit. By taking circuit theory II, minimum necessary knowledge for electric circuits can be obtained. Office hour after class.Tech1-5 F515

プログラム演習　Computer Programming Using C

[Instructor] Yasukuni Mori
[Credits] 2
[Semester] 2nd year-Spring　Fri 3
[Course code] T1U010002

[Room] Bldg. Eng.1- 501 information engineering Seminar room (1)

[Course description] This course covers fundamentals of C programming language. Students are expected to learn about how to program and construct algorithms through some exercises.

[Course objectives] Students are expected to be able to understand, implement and debug practical computer programs using C language. Through this course, students should be able to:

Read and understand C programs.

Gain sufficient understanding of algorithms and data structures that are necessary for more complex programs.

Become familiar with computers with UNIX environment.

Learn programming skills to be needed in more advanced computer science.

Exercise logical thinking and problem solving skills.

[Plans and Contents]

The following is a list of keywords to be covered throughout the semester.

1. Guidance, programming fundamentals
2. Variables
3. Control statements
4. Looping
5. Arrays
6. Functions
7. Character arrays
8. Pointers
9. Pointers and arrays
10. Character arrays and pointers
11. Basic of structures
12. Self-referential structures (1)
13. Self-referential structures (2)
14. File I/O
15. Algorithms and data structures

[Keywords] C Programming, Algorithms, Data Structures

[Textbooks and Reference Books] Meikai C-Gengo Nyumon-Hen, BohYoh Shibata, Softbank

[Evaluation]

Evaluation is made based on attendance, exercises related to the material covered in each lecture.

[Related courses] Information Processing,Computer Literacy for Information and Image Sciences, Design and Implementation of Computer Programs I.
Students must have mastered the basic operations of computers with UNIX environment.

[Remarks] Targeted at students whose student matriculation number ends with an even number.

プログラム演習　Computer Programming Using C
[Instructor] Yasukuni Mori
[Credits]2
[Semester] 2nd year-Spring　Fri 2
[Course code]　T1U010001

[Room] Eng.-Bld.1-501 information engineering Seminar room(1)

[Course description] This course covers fundamentals of C programming language. Students are expected to learn about how to program and construct algorithms through some exercises.

[Course objectives] Students are expected to be able to understand, implement and debug practical computer programs using C language. Through this course, students should be able to:

Read and understand C programs.

Gain sufficient understanding of algorithms and data structures that are necessary for more complex programs.

Become familiar with computers with UNIX environment.

Learn programming skills to be needed in more advanced computer science.

Exercise logical thinking and problem solving skills.

[Plans and Contents]

The following is a list of keywords to be covered throughout the semester.

1. Guidance, programming fundamentals
2. Variables
3. Control statements
4. Looping
5. Arrays
6. Functions
7. Character arrays
8. Pointers
9. Pointers and arrays
10. Character arrays and pointers
11. Basic of structures
12. Self-referential structures (1)
13. Self-referential structures (2)
14. File I/O
15. Algorithms and data structures

[Keywords] C Programming, Algorithms, Data Structures

[Textbooks and Reference Books] Meikai C-Gengo Nyumon-Hen, BohYoh Shibata, Softbank

[Evaluation]

Evaluation is made based on attendance, exercises related to the material covered in each lecture.

[Related courses] Information Processing, Computer Literacy for Information and Image Sciences, Design and Implementation of Computer Programs I.

Students must have mastered the basic operations of computers with UNIX environment.

[Remarks] Targeted at students whose student matriculation number ends with an even number

工学倫理（情報画像）Engineering Ethics

[Instructor] (Naoto Kawamura)
[Credits] 2
[Semester] 2nd year-Spring Mon 5
[Course code] T1U011001
[Room] Bldg.Eng.2-103
(Bldg. ENG-2 cannot be used during 2014 fall semester.)
[Course description] Engineering brings wealth to our lives, but when incorrectly used harms the future, even human life and the global environment. Engineers must have considerate decision and discretion at all times, being responsible for the practical use of technology. This lecture aims to teach missions as engineers and to see from a broader point of view.
[Course objectives] To learn basic concepts of mission as an engineer, responsibility and ethics through various cases study and advance the development of adequate technology as well as recognition in society.
[Plans and Contents]
1. Introduction to engineering ethics: "why we need engineering ethics? learn about preventive ethics, ethics for engineers, etc..
2. Individual in an organization, corporate and social responsibility: through several case studies, learn about "business logic and ethics", and "corporate social responsibility", etc.
3. Engineers and ethics whistle-blowing: lessons from the case study about the ethics of whistle, whistle on condition. Industry and the whistle-blowing system measures are also described.
4. Safety and risk: disputed concepts of risk for new technologies, learn about accountability as the discovery, engineers, etc.
5. Quality control and product liability: background of establishment and contents of the product liability, product liability law, required for manufacturers (engineer), cooperation in enterprises through a case study of learning.
6. Ethics / industrial property and intellectual property rights: industrial property purposes and learning regarding the differences between the systems of philosophy, the National Government. Also to introduce how to write a statement, flow of the acquisition of patent rights, software patents, patent system model.
7. Intellectual property and ethics and patent litigation: through the case study of submarine patent and patent litigation issues, patents, inventions, rights issues, etc.
8. Copyright and ethics: about the contents of the copyright system, moral rights and neighboring rights, learn about copyright ethics in the delivery of information on the Web, hard/soft copy documents and digital content.
9. Network and ethics: social changes in network expansion and network abuse problem, privacy infringement problems, file exchange, delivery problems, etc., learn ethics on the Internet through various case studies.
10. Engineers and environmental ethics: PRTR law, risks of chemical substances, technology, environment and global environmental issues, and learn about sustainable development, natural, full and harmonious future generations.
11. Engineers and bioethics: bioethics and, organ transplants, on ethics, euthanasia, genetic manipulation, etc., think of learn the need for bioethics in the engineering area.
12. International activities and ethics: think learn the difference between the friction and problems associated with globalization, intercultural, North American and Japanese companies, and differences in the employment system, introduce international standardization activities and international cooperation activities, and should be as a cosmopolitan appearance.
13. The practice of engineering ethics: thinking through various case studies and differences in values and ethics conflict, action guidelines for the practice of engineering ethics and ethical behavior,.
14. Technology and future debt: through the case study of thinking about new technology and risk, debt for the future generation.
15. As a-proud engineer - summary: retrospective ever of course, as a summary how should be engineers or engineering

should be. Learning and discussion through case studies.

[Keywords]

[Textbooks and Reference Books] Engineering Ethics ISBN 978-4-501-62640-2

[Evaluation]

A mini-test will be conducted at the end of each lecture and evaluation will be based on the results of these mini-tests. Note that credits will not be award if the number of attendances is less than 12.

[Remarks] The order and contents of the lectures may change at the discretion of the lecturer. Make sure you attend the guidance talk conducted at the beginning of the first lesson.

電磁波と光　Lecture and Seminar :　Electromagnetic Wave and Light

[Instructor] Hiroaki Kuze, Hitoshi Irie

[Credits] 2

[Semester] 2nd year-Spring-Mon 4

[Course code] T1U012001

[Room] Bldg.Eng. 2-103

(Bldg. ENG-2 cannot be used during 2014 fall semester.)

[Course enrollment] 90

[Candidate]Students of faculty of Engineering, other Faculties, and Specially Registered Non-Degree Student .

[Course description]　Optical phenomena can be understood in the framework of either geometrical optics, wave optics, or electromagnetic optics. In this course, we will consider how to describe various optical phenomena scientifically, paying attention to their applications in science and engineering.

[Course objectives] The objective of this course is to acquire the most essential aspects of various optical phenomena as the basics of information and image sciences.

[Plans and Contents]　Preparation and review using the designated textbook are recommended. The following schedule and contents are subject to alteration.

1. Topics in optics
2. Mathematical expressions of optical waves
3. Description of electromagnetic waves
4. Geometrical optics: refraction and reflection
5. Fresnel reflectance
6. Image formation in geometrical optics
7. Aberration in optical systems
8. Spectra and blackbody radiation
9. Interference
10. Diffraction

[Keywords] light rays, optical wave, polarization, image formation, optical instruments, blackbody, spectrum, laser, interference, diffraction

[Textbook and Reference Books] 1) Hiroaki Kuze, “Electromagnetic wave and light” (Denjiha to Hikari), An original textbook for this lecture and seminar, 2) Sadao Aoki “Introduction to Optics” (Kogaku Nyumon), ISBN 4-320-03419-8, Kyoritu Publishing, 2002, 3) G.R. Fowles, “Introduction to Modern Optics” , ISBN 978-0486659572, Dover Books on Physics, 1989.

[Evaluation] The evaluation will be made on the participation in the lecture course (including short reports), reports, and examination at the end of the course.

情報画像実験 I Laboratory Work in Informatics and Imaging Systems I

[Instructor] Department of Informatics and Imaging Systems Staffs

[Credits] 2

[Semester] 2nd year-Fall Fri 3,4,5

[Course code] T1U014001, T1U014002, T1U014003

[Room] Bldg. Eng.1 3F audiovisual classroom, Laboratory of Department of Informatics and Imaging Systems Experiment

[Candidate] Students of Department of Informatics and Imaging Systems

[Course objectives] This laboratory work gives basis in the 4th year graduation work. The purpose of this laboratory work is to find problems on your own and solve them. Students have to understand reference text as well as ones given from each teacher for better deeper understanding of image information engineering.

[Plans and Contents] Around 30 students in a group, to do the following experiment. 4 Weeks perform each experiment.

1. Optics, image (reflection, refraction)
2. Optics, image (diffraction, interference)
3. Optics, image (polarized light)
4. Optics, image (Fresnel reflection)
5. Optics, image (summary)
6. Electronic circuits (creation of rectifier)
7. Electronic circuits (creation of electronic circuit and measurement)
8. Electronic circuits (creation of electronic circuit and measurement)
9. Electronic circuits (gate theory)
10. Electronic circuits (summary)
11. Audio signal processing (AD conversion)
12. Audio signal processing (Fourier transformation)
13. Audio signal processing (voice analysis)
14. Audio signal processing (sound composition)
15. Audio signal processing (summary)

[Evaluation] Evaluation is given by attendance and reports.

確率と統計　Probability and Statistics

[Instructor] Ikuo Matsuba

[Credits]: 2.

[Semester] 2nd year-Fall Tue 2

[Course code]T1U015001

[Room] Bldg.Eng. 2-103

(Bldg. ENG-2 cannot be used during 2014 fall semester.)

[Candidate] 2nd year All Faculty of Engineering students, Other Department's students, and Specially Registered Non-Degree Student;

[Course description] Lecture on foundations of probability and probability for information engineering.

[Course objectives] Understanding the basics of probability theory essential in order to understand the mathematical structure for information purposes and goals. Fundamentals of information theory and a better understanding from the probabilities to the stochastic process, further discussions, such as the application of information technology.

[Plans and Contents] According to the textbook, learn the basic concepts of probability, independent events, and representation of the probability that represents the uncertainty concept, addition theorem, multiplication theorem, priors, posterior probability, and Bayes theorem (Objective and purpose)

According to the textbook, learn the basic concepts of probability, independent events, representation of the probability that represents the uncertainty concept, addition theorem, multiplication theorem, priors, posterior probability, Bayes theorem, random variables, distributed, autocorrelation function, probability density function, distribution function, independent application example in the property for the sum of random variables, Center pole limited management, generating functions and moment generating functions, information engineering, (such as search algorithm, ） information with uncertainty, statistics

1. Basic probability, array and combination
2. Event and probability
3. Addition theorem and conditional probability
4. Distribution rule and Bayes theorem
5. Event independence and its applications
6. Binomial distribution and its applications
7. Approximation theory, Gaussian distribution
8. Random variable, probability density
9. Expected value, average, variance
10. Statistics (estimation, testing)
11. Random variable functions and its applications
12. Generating function, moment-generating function
13. Generating function 1
14. Generating function 2
15. Applications to information engineering (search algorithm)

[Keywords] Probability, Addition Theorem, Bayes' theorem, Generating Function, Momentum Generating Function, Statistics

[Textbooks and Reference Books] Textbooks：Probability, Matsuba, Asakura Publishing Co. Ltd.

[Evaluation] Evaluation will be given by Interim exam, the end -of term exam and attendance

情報数学 II　Mathematics for Information Science II

[Instructor] Kishimoto Wataru

[Credits] 2.

[Semester] 2nd year-Fall Tue 4

[Course code]T1U016001

[Room] Bldg.Eng.2-103, Bld.Eng.17-112

[Candidate] 2nd year students of Department of Informatics and Imaging Science Elective Compulsory

[Course description] Lecture and practical trainings in fundamental mathematics to learn specialized subjects in the information and image science, and fundamental matters for the computer science concerning discrete mathematics (graph theory and language) with examples.

[Course objectives] Learn the fundamental matters in mathematics (graph theory, language etc.) concerning information and image science. Also the mathematics used in various disciplines with basic knowledge of the language, Automaton, graph theory and computational models.

[Plans and Contents]

1. Definition of a graph
2. Connectivity
3. Tree
4. Cycle
5. Graph colorings
6. Planar graph
7. Matching
8. Summary of graph theory
9. Automaton
10. Language and automaton
11. Non-deterministic finite automaton
12. Regular expression
13. Turing machine
14. Computational complexity
15. Overall summary

[Keywords] Mathematics for information science, Discrete mathematics, Language, Automaton, Graph theory, Turing machine

[Textbooks and Reference Books] Textbook： “IT Text Risansugaku，Matsubara et.al.，Ohmsha

[Evaluation]An interim exam will be conducted during the 9th lecture while an end-of-term exam will be conducted during the 15th lecture. Evaluation shall be based on the two exams and mini-tests conducted during the lectures. The weightage assigned to the interim exam, end-of-term exam and mini-tests are about 4:4:2.

[Related courses] Mathematics for Information Science I

[Course requirements] Students have preferably taken courses of Mathematics for Information Science I.

[Remarks] Enrollment of students entered this university before 2003will not receive Credits. Those who has joined in from 2004 to 07 to take the Mathematics for Information Science I and Mathematics for Information Science II, will not receive Credits for both, they only receive Credits for either of the two.

プログラムの設計と実現 II　Design and Implementation of Computer Programs II

[Instructor] Yasuo Horiuchi
[Credits] 2.
[Semester] 2nd year-Fall Tue 3
[Course code] T1U019001
[Room] Bldg.Eng. 2-103, Bldg.GNE.H45
[Course enrollment] 96
[Course description] Students will learn basic programming with object-oriented language. Java programming will enable students to find out the way of thinking in object-oriented programming fundamental for large scale system design. In this lecture, students will learn about basic object-oriented programming and Java programming.
[Course objectives] that students may write a simple program in Java language. It is essential to learn the basics of programming when using computers in future studies and to have understanding of object-oriented programming. First for basic Java programming knowledge, there will be (1) variable (2) conditional brunch (3) loop (4) array to write basic program in Java, then (5) concept of "class", this concept and object-oriented programming is essential for all students, which is followed by and proceeding to, requirement for Java programming in actual engineering, (6) file input and output and (7) GUI to be able to write applicable and useful program.
[Plans and Contents] This class learns basic of Java language referencing C language and the basis of object-oriented programming understanding the concept of "class", then learns the techniques for practical programming. In this class, students will take the lecture and then write the Java program using the computer. Exercise material will be on WWW.
1. Guidance
2. Introduction to Java
3. Variable
4. Conditional branch
5. Loop
6. Array
7. Object-orientated and class
8. Encapsulation
9. Constructor
10. Class inheritance
11. Overload and override
12. Exception handling (1)
13. Exception handling (2)
14. Text files input and output
15. Window, keyboard input
[Keywords] Object Oriented Programming, Java Language, Class
[Textbooks and Reference Books]
No textbooks are specified in particular. Students may prepare their own reference books depending on their own capabilities and preferences since there are many books on the Java language that are in publication.
For example, “Easy-to-Understand Java” by Takashi Kawaba, Hidekazu System (Introductory Guide / Introduction to Object-Oriented Programming / self-study and revision of 3 sub-volumes on object-oriented programming).
[Evaluation] Evaluation to be based on the programing execises of each lecture and reports of challenging programs.
[Related courses] Students must know basic C language and programming through courses like “Computer Literacy for Information and Image Sciences”, “Design and Implementation of Computer Programs I”, ” Computer Programming Practice”, JAVA language and object-oriented programming which are all essential for experiment and graduate research.
[Course requirements] Students must have taken courses of Design and Implementation of Computer Programs I.
[Remarks] Questions and opinions are welcome anytime during and after the lectures and during office hours. The seminars will be conducted in Building 1, 5F, Computer Room 501.

色彩と画像 Color and Image

[Instructor] Hirohisa Yaguchi

[Credits] 2.

[Semester] 2nd year-Fall Mon 4

[Course code] T1U020001

[Room] Bldg.Eng.2-103

(Bldg. ENG-2 cannot be used during 2014 fall semester.)

[Course description] Application to information processing by computer and basic color science required in image acquisition, processing, and reproduction of color images

[Course objectives] With changes in image information societies and information technology advances, color knowledge is more and more important in many fields of science. Color media had caused a spread of color devices and networks, has turned large-scale color images to something that anyone can work with. We will learn color information science responding to the above situation. First, the mechanisms of color vision and how the human vision system works. Then to color psychological knowledge, and deepen the understanding of the phenomenon of color perception. Also for quantifying of color, learn the color theory and colorimetry. Further understanding about the methods and principle of color reproduction of images and the recent color management system.

[Plans and Contents]

1. Radiation, Light and color
2. Structure and functions of human visual system
3. Brightness and mechanism of color vision
4. Color order system
5. Color matching experiment and color matching function
6. CIE-XYZ colorimetric system
7. Colorimetry seminar (1)
8. Uniform color space and color difference
9. Colorimetry seminar (2)
10. Color discrimination
11. Color appearance
12. Image systems and principles of color reproduction
13. Objective of color reproduction
14. Practice of color reproduction
15. Color appearance and color management

[Keywords] Color imaging, Color vision, Colorimetry, Color reproduction, Color psychology

[Textbooks and Reference Books] Handout will be uploaded on appropriate time on the Web.

[Evaluation] Comprehensive evaluation will be given attendance (25%), reports (25%), and the end -of term exam (50%)Credits will not be given less than 59 points.

画像解析システム論 Theory of image analysis system

[Instructor] Yoshitsugu Manabe

[Credits] 2

[Semester] 2nd year-Fall Wed 4

[Course code]T1U021001

[Room] Bldg.Eng. 5-104

[Course enrollment] 100

[Course description] This lecture comments history of imaging devices, its mechanisms and color imaging, and explain the input method of image information in the computer and more sophisticated imaging systems with some relevant examples. Moreover characteristics of image and some theories for image coding (compression) techniques are explained.

[Course objectives] The objective of this lecture is to learn imaging system by getting fundamental knowledge of image input / output and human recognition.

[Plans and Contents]

1. Image reproduction in the multi-media era
2. Measurement technology
3 .Color representation
4. Formation of digital images
5. History of image input devices
6. Structure and characteristics of an image sensor (CCD)
7. Color imaging technology
8. First half summary
9. Image compression technology
10. Statistical properties of images
11. Predictive encoding
12. Spatial frequency characteristics and orthogonal transformation encoding of images
13. Data volume reduction technology
14. Image compression standards and norms
15. Second half summary and future developments

[Keywords] Sensor, Imaging, Digital Image, Image Coding

[Textbooks and Reference Books] It will be provided via HP. Password will be also provided in the first Lecture.

[Evaluation] Evaluation will be given by Interim exam and The end -of term exam (80%), attendance・report (20%) Over 11times of attendance will be precondition to archive a credit.

多変量解析 Multivariate Analysis

[Instructor] Noritaka Osawa
[Credits] 2
[Semester] 2nd year-Fall Wed 2
[Course code] T1U023001
[Room]: Bldg.Eng. 2-103
(Bldg. ENG-2 cannot be used during 2014 fall semester.)
[Course description] Basics of multivariate analysis: linear regression analysis, principal component analysis, discriminant analysis, clusters analysis.
[Course objectives] To understand basic methods of multivariate analysis, to apply them to problems properly, and interpret statistical results appropriately: (1) Linear regression analysis (2) Principal components analysis (4) Discriminant analysis (3) Cluster analysis (5) Tools for statistical analysis.
[Course description] Lectures are planned as below to master basics of multivariate analysis. Each lecture usually includes exercises and/or assignments to improve understanding of topics in the lecture.
1. Introduction, Basics of statistics (1)
2. Basics of statistics (2), Statistical analysis tool (Excel)
3. Basics of statistics (3), Statistical analysis tool (R)
4. Simple linear regression analysis (1)
5. Simple linear regression analysis (2)
6. Multiple regression analysis (1)
7. Multiple regression analysis (2)
8. Summary of Basics of statistics and Regression analysis
9. Principal component analysis (1)
10. Principal component analysis (2)
11. Principal component analysis (3)
12. Discriminant analysis
13. Cluster analysis
14. Machine learning
14. Application of multivariate analysis
15. Summary
[Keywords] Multivariate analysis, Regression analysis, Principal component analysis, Discriminant analysis, Cluster analysis
[Textbooks and Reference Books] textbook: Nagatomo Nakamura, Analysis of multidimentional data (in Japanese), Kyoritsu Shuppan. Reference books: (1) Takaharu Araki (ed.) Multivariate analysis starting with R and R commander, Union of Japanese Scientists and Engineers. (2) University of Tokyo, Faculty of Arts and Sciences, Department of Statistics (ed.), Introduction to Statistics (in Japanese), University of Tokyo Press. (3)Yutaka Tanaka, Kazumasa Wakimoto, Multivariate statistical analysis(in Japanese), Gendai sugakusha (4) Mingzhe Jin, Data Science Learning Through R (in Japanese), Morikita Publishing. (5) Tamio Kan Multivariate analysis learning through Excel (in Japanese) Ohmsha.
[Evaluation]
Students will be assessed by results of interim and end-of-term exams (80%), and evaluations on exercises, assignments, and reports (20%).
[Related courses] Probability and Statistics (T1U015001)
[Course requirements]
Students need to either have completed Statistics B1 (G17133207) or have an equivalent level of knowledge.
[Remarks] From the second lecture onwards, lectures will be given at Computer room 501 in Engineering Building 1.

画像有機化学 Organic Chemistry for Imaging

[Instructor] Shinichi Miyakawa
[Credits] 2.0
[Semester] 2nd year-Spring Mon 2
[Course code] T1U024001
[Room] Bldg.Eng -2-201

(Bldg. ENG-2 cannot be used during 2014 fall semester.)

[Candidate] Students of faculty of Engineering, other Faculties, and Specially Registered Non-Degree Student ; 2nd year of Department of Image Sciences (compulsory)

[Course description] Many materials that form images are mostly organic compounds, like color pigment. To understand these, we will discuss organic chemistry in its principles and structures necessary for image forming. Specifically, organic chemistry reaction structure for organic function material design and synthesize. Also for reaction of compounds used and applied for actual image forming.

[Course objectives] ［General Target］understand the mechanism and function of organic functional material, specifically in chemical reaction of compounds. Have basic knowledge about stability and reactivity of chemical reaction, compound or intermediate for material designing and synthesizing［Attainment Target］（knowledge・understanding ）Understand basic organic reaction of organic chemistry by each functional group understand. Understand the reaction of compounds in image formation in light functional material and image organizing material（evaluated by tests between classes and finals.（logical thinking）Speculate the synthesize method and reactions of compounds and reactions they see for the first time（evaluated by exams）.（interest and motivation for class）. Have more interest toward chemical material, notably material that form images.（evaluated indirectly through attendance sheets）.（participation）Do research and examination in above field of interest on their own（evaluated by reports）.（expression and skills）explain the mechanism and reaction related to image forming material on their own language（evaluated by reports）Practicing ideas and knowledge's for other classes like pigment synthesize in "Image Science experiment II" and molecule modeling in "Image Science experiment IV"（the latter will not be directly evaluated）

[Plans and Contents]

1. Guidance on the lecture plan. Explanation on the relationship between image formation and chemistry, especially image formation and organic chemistry will be held. A pop-quiz will be conducted to assess the level of understanding of Basic Chemistry B and review session will also be conducted for Basic Chemistry B.
2. Spatial structure and isomer of organic compounds
3. Electron orbit and molecular structure
4. Chemical bond and reaction
5. Bond formation and breakage, reaction intermediate
6. Aromaticity, resonance
7. Properties and reactions of aromatic compounds
8. Image and color
9. Molecular structure and optical absorption
10. Properties and reactions of carbonyl compounds(1)
11. properties and reactions of carbonyl compounds (2)
12. properties and reactions of carbonyl compounds (3)
13. Properties and reactions of amine
14. Image and macro-molecules (1)
15. Image and macro-molecules (2)
16. The end -of term exam-

[Keywords] Organic Chemistry, Organic chemistry reaction theory, Images, Image Chemistry

[Textbooks and Reference Books] Not specified, with hand out materials for review and home task. For reference, beginner's guide to organic chemistry in college, Kagku Dojin for preparation. For more understanding, and review, Morrison-Boyd Organic Chemistry, Tokyo Kagaku Dojin and Solving problems in organic chemistry-following Morrison-Boyd for self evaluation

[Evaluation] Overall evaluation will be based on the results of several pop quiz (40%), reports (10%) and results on final exams (50%).

[Related courses] Basic Chemistry B, Laboratory Work II in Image Science, Laboratory Work IV in Image Science

[Course requirements] As a general rule, students should preferably be taking Basic Chemistry B (Department of Image Science) or a similar subject (others).
[Remarks] Attendance necessary and recorded by attendance sheet original for this class. Credits will not be given to those who lacked required attendance, students must report if they will be absent on account of sickness or other grounds. Small test will be announced before the class in which the test will be conducted (must be attended), more than 4 times and not fixed according to the progress in class.
Report themes will be also announced only in class. Students must use Moodle for handouts and review material or web exercises and test through Moodle.

情報画像実験 II　　Laboratory Work in Informatics and Imaging Systems II

[Instructor] Department of Informatics and Imaging Systems Staffs

[Credits] 2

[Semester] 3rd year-Spring Wed 3,4,5

[Course code] T1U025001, T1U025002, T1U025003

[Room] Laboratory of Department of Informatics and Imaging Systems

[Course description] 3 experiments in 3 groups for 5 weeks.

[Candidate] Students of Department of Informatics and Imaging Systems

[Course objectives] This laboratory work gives basis in the 4th year graduation work. The purpose of this laboratory work is to find problems on your own and solve them. Students have to prepare for experiment, do the task carefully and submit report by the deadline.

[Plans and Contents] By below Schedule in 30-people groups.

1. Logical circuit 1
2. Logical circuit2
3. Logical circuit3
4. Logical circuit4
5. Logical circuit5
6. Image processing1
7. Image processing2
8. Image processing3
9. Image processing4
10. Image processing5
11. Network1
12. Network2
13. Network3
14. Network4
15. Network5

[Keywords] Laboratory work, Logical circuit, Image processing, Network

[Textbooks and Reference Books] Text of Experiment is given in the Guidance on April.

[Evaluation] Full attendance and submission of reports before the deadlines are pre-requisites for credits to be awarded. Credits will not be awarded if any of the report for a topic is not submitted before the deadline. Evaluation shall be based on the attitude during the experiments (20%) and reports (80%).

[Related courses] Laboratory Work in Information and Image Sciences I, Laboratory Work in Information and Image Sciences III

[Course requirements]　58 or more credits must be obtained for courses available until the 4th semester and end of the 2nd year.

情報画像基礎英語　Introductory English for Information and Image Science

[Instructor] Machiko Ohta

[Credits] 2

[Semester] 2014-2015 First [Day, Time] Tuesday 2:30 PM - 4:00 PM

[Course Code] T1U026001

[Room] Bldg. ENG-17-212

[Course enrollment] Limited to 3rd year students at the Department of Informatics and Imaging Systems.

[Course Description] This course employs a three-tier English proficiency model: grammar and everyday English vocabulary as the basic tier, general academic vocabulary as the middle tier, and technical vocabulary as the top tier. This course trains students to build general academic vocabulary through weekly assignments and expose students to technical terms through reading documents on informatics and imaging systems.

[Course objectives] The course is designed to help students to build a solid foundation for writing academic papers.

Students will:

embrace grammar as the infrastructure for better communication,

understand the importance of building general academic vocabulary before learning technical terms and expressions,

learn effective methods for building and expanding general academic vocabulary, and

be encouraged to search for and read research reports, journal articles, and other technical materials on their own interests.

[Plans and Contents] The course starts with English proficiency test. Following classes use the required textbook and on-the-spot exercises. The final class outlines the structure of academic papers. A class on June has Examination 1 and a class on July Examination 2.

[Keywords] autonomous learning, general academic vocabulary, technical terms, technical writing

[Textbooks and Reference Books]

Required textbook: Academic Vocabulary in Use (ISBN: 9780521689397)

The other materials will be offered as handouts in class or as PDF files through Moodle.

Recommended book: Science Research Writing: A Guide for Non-Native Speakers of English (ISBN: 978-1848163102)

[Evaluation]

Examination 1 (35%), Examination 2 (65%)

[Related courses]

The instructor is also responsible for English IW6 and English IR21, courses focusing on grammar and basic academic vocabulary; English for Science (7 & 8) focusing on general academic vocabulary and general scientific vocabulary; Technical English II for students at the Department of Medical System Engineering.

[Remarks] An absence from an Examination will justified only by emergencies, as specified by Chiba University.

Examination 1 (35%), Examination 2 (65%)

情報画像基礎英語　Introductory English for Information and Image Science

[Instructor] Machiko Ohta

[Credits] 2

[Semester] 2014-2015 First [Day, Time] Tuesday 4:10 PM - 5:40 PM

[Course Code] T1U026002

[Room] Bldg. ENG-17-212

[Course Enrollment] Limited to 3rd year students at the Department of Informatics and Imaging Systems.

[Course Description] This course employs a three-tier English proficiency model: grammar and everyday English vocabulary as the basic tier, general academic vocabulary as the middle tier, and technical vocabulary as the top tier. This course trains students to build general academic vocabulary through weekly assignments and expose students to technical terms through reading documents on informatics and imaging systems.

[Course objectives]

The course is designed to help students to build a solid foundation for writing academic papers.

Students will:

embrace grammar as the infrastructure for better communication,

understand the importance of building general academic vocabulary before learning technical terms and expressions,

learn effective methods for building and expanding general academic vocabulary, and

be encouraged to search for and read research reports, journal articles, and other technical materials on their own interests.

[Plans and Contents] The course starts with English proficiency test. Following classes use the required textbook and on-the-spot exercises. The final class outlines the structure of academic papers. A class on June has Examination 1 and a class on July Examination 2.

[Keywords] autonomous learning, general academic vocabulary, technical terms, technical writing

[Textbooks and Reference Books]

Required textbook: Academic Vocabulary in Use (ISBN: 9780521689397)

The other materials will be offered as handouts in class or as PDF files through Moodle.

Recommended book: Science Research Writing: A Guide for Non-Native Speakers of English (ISBN: 978-1848163102)

[Evaluation]

Examination 1 (35%), Examination 2 (65%)

[Related courses]

The instructor is also responsible for English IW6 and English IR21, courses focusing on grammar and basic academic vocabulary; English for Science (7 & 8) focusing on general academic vocabulary and general scientific vocabulary; Technical English II for students at the Department of Medical System Engineering.

[Remarks]An absence from an Examination will justified only by emergencies, as specified by Chiba University.

Examination 1 (35%), Examination 2 (65%)

数値計算の理論と実際 Numerical Computation Theory and Applications

[Instructor]　(Kawamura Tetsuya)

[Credits] 2

[Semester] 3rd year-Spring Intensive

[Course code] T1U028001

[Room]　Bldg.Eng.2-201

(Bldg. ENG-2 cannot be used during 2014 fall semester.)

[Course description] Lecture and exercise in basic and simple numerical computation method.

[Course objectives] Lecture on basic numerical computation essential to technologies, designing program for actual use as well as theoretical view. Emphasis added on solution of linear differential equations, which is important in engineering

[Plans and Contents]

1. Preface to numerical calculation computation methods
2. Solution to non-linear equations 1
3. Solution to non-linear equations 2
4. Solution to simultaneous linear algebraic equations 1
5. Solution to simultaneous linear algebraic equations 2
6. Discrete interpolation of functions 1
7. Discrete interpolation of functions 2
8. Numerical differentiation and integration
9. Solution of ordinary differential equations 1
10. Solution of ordinary differential equations2
11. Solution of partial differential equations using difference method
12. Solution of partial differential equations using difference method 2
13. Finite element method
14. Boundary element method
15. Exam

[Evaluation] Evaluation will be given by The end -of term exam and report　writing

[Related courses] Linear algebra and calculus in Year 1 and 2

[Remarks] The schedule is announced at the beginning of semester.

情報通信ネットワーク　Information and Communication Network

[Instructor]Hiroo Sekiya
[Credits] 2.
[Semester] 3rd year-Spring Fri 5
[Course code]T1U030001
[Room] Bldg. Eng.2-103
(Bldg. ENG-2 cannot be used during 2014 fall semester.)
[Course enrollment] 120
[Candidate] Students of faculty of Engineering, other Faculties,and Specially Registered Non-Degree Student .3rd year and 4th year students.
[Course description]
Learn about various communication networks, basic technologies such as distributed processing, the Internet, protocol technologies, and applications of such networks. In addition, understand involvements of information and communication networks in the society.
[Course objectives]
The objective of this lecture is to learn about the Internet-based information and communications, the IT core technologies, and the future ubiquitous system technologies.
[Plans and Contents]
Learn about the basic concept of communication, involves Laboratory Work in Informatics and Imaging Systems II, in the first couple of lectures. Next, learn about the meaning of information and communications. After that, IT core technologies and the future ubiquitous system technologies.
1.TCP/IP (1): Communication protocol and its hierarchy, OSI hierarchy model, various routing algorithms (RIP/Bellman-Ford, OSPF/Dijkstra), multicast control algorithms (PIM-SM, SSM) and protocols (mobile IP/NEMO, IPv6)
2. TCP/IP (2): Working principle of TCP (Connection cotnrol, flow control, congestion control, error control, and retransmission control), multimedia communication using UDP, TCP variation
3. TCP/IP (3): ARP, ICMP, DHCP, and NAT
4. PHY (1): Basic principle of communication (Sampling theory and quantization), basic modulation schemes, frequency and communication property
5. PHY (2): Multiple access schemes (FDMA and TDMA)
6. PHY (3): Multiple access schemes (CDMA and OFDM), and optical communication
7. Outline of information and communication network: Changes and situation in information and communication networks (circuit switching and packet switching, telephone network and the Internet, wired network and ubiquitous network, intensive processing and distributed processing)
8. Distributed processing architecture: Features of centralized processing (Client-server system) and distributed processing (pure P2P and hybrid P2P), network virtualization and cloud computing
9. Distributed algorithm: Synchronization, deadlock, leader selection problem, distributed transactions via database, update and control of duplicate data, ACID (atomicity, consistency, independence, and sustainability)
10. Multimedia communication on the Internet: Video and audio encoding methods, communication and multimedia, QoS control (Intserv/RSVP, Diff serv, RTP/RTCP, RTSP, SIP, MPLS), traffic control (basics of queueing theory)
11. Network security: Coding, authentication algorithms (DES/AES, RSA), firewall, illegal access detection, control (IDS/IPS), anti-virus measures, network security protocol (IPsec, SSL/TLS, S/MIME)
12. Network application system: P2P content distribution network, content caching, Web service, cloud computing

13. Types and working principles of ubiquitous networks: Ubiquitous system architecture, standardization trends, short distance wireless (RFID, DSRC, NFC etc.), wireless PA (Bluetooth, UWB, ZigBee, milli-wave communications), wireless LAN (IEEE802.11/b/a/g/n), wireless MAN (IEEE802.16/16e）

14. Applications of ubiquitous networks and future developments: Mobile ad-hoc networks, sensor network and energy-saving communications (smart grid), home and consumer electric network, NGN (next generation network), combined communication broadcast with IPTV

[Keywords]Internet,Network architecture , ubiquitous systems, distributed processing,multimedia communication, protocol,Computer network

[Evaluation] Evaluation will be given by examination, attendance, reports

[Related courses] Applied mathematics, operating system, database, multimedia data processing, digital signal processing

プログラム言語の構造 Computer Programming Languages

[Instructor] Takashi IMAIZUMI

[Credits] 2

[Semester] 3rd year-Spring Thu 3

[Course code] T1U031001

[Room] Bldg.Eng. 17-213

[Course enrollment] 80

[Course description] Lecture from lexical analysis, syntax analysis to code generation to the whole of compiler.

[Course objectives] To understand the process of analysis and compiling programming language compiler and to load the configuration file on their own.

[Plans and Contents]

1. Guidance
2. Overview of compiler
3. Syntax and language
4. Lexical analysis
5. Top-down syntax analysis
6. Bottom-up syntax analysis
7. Interim exam Interim exam

8 Semantic analyses

9. Error processing
10. Executed memory and virtual machine
11. Code creation
12. Optimization (1)
13. Optimization (2)
14. Various programming languages
15. The end-of term exam

[Keywords] Context free Grammar, Compiler, Syntax analysis

[Textbooks and Reference Books] Textbook: Ikuo NAKATA, Compiler structure and Optimization, Asakura-shoten, Reference book: Ikuo NAKATA, Compiler, Ohm-sha

[Evaluation] Evaluation will be given assignment in lecture, homework Interim and end-of-term both exam of score.

パターン認識基礎 Pattern Recognition

[Instructor]Norimichi Tsumura
[Credits] 2
[Semester] 3rd year-Spring Fri 2
[Course code] T1U032001
[Room] Bldg.Eng. 2-103
(Bldg. ENG-2 cannot be used during 2014 fall semester.)
[Course description] Lecture on basic theory on pattern recognition necessary in varied field of information engineering.
[Course objectives] Recognize the importance of pattern recognition process and feature extraction. Learn basic (including mathematical) method of pattern recognition. Understand statistical pattern recognition and method. Learn concept of learning algorithm. Learn how to handle feature space, feature analysis, feature transform.
[Plans and Contents]
1. What is pattern recognition?
2. Characteristic spectral and characteristic space
3. Characteristic spectral and characteristic space(2)
4. Learning and identification functions (1)
5. Learning and identification functions(2)
6. Learning and identification functions(3)
7. Relationship with neural networks
8. Design of identification part (1)
9.Design of identification part(2)
10. Evaluation of characteristics and Bayes error probability (1)
11. Evaluation of characteristics and Bayes error probability(2)
12. Evaluation of characteristics and Bayes error probability(3)
13. Transformation of characteristic space
14. Subspace method
15. Summary and future developments, the end-of term exam
[Keywords] Feature vector, Perceptron, Learning
[Textbooks and Reference Books] To be purchased：WAKARISASUI PATTERN NINSHIKI, ISBN4-274-1349-1
[Evaluation]. Evaluation will be given comprehensively by attendance and all report writing and the result of end-of term exam and so on.

ヒューマンインタフェース Human Interface

[Instructor] Shingo Kuroiwa
[Credits] 2
[Semester] 3rd year-Spring　Tue 2
[Course code]T1U033001
[Room] Bldg.Eng.2-202
(Bldg. ENG-2 cannot be used during 2014 fall semester.)
[Course enrollment] assuming around 40 students
[Course description]
In addition to lectures, students will be required to conduct presentations and participate in open discussions. At the beginning, a lecture on the basic concept of human interface will be given. Based on the concept, students will look for examples of things that they find “easy to use / hard to use” from their surroundings, write a report and conduct a presentation on these things. The lecturer and fellow students will then conduct a discussion and mutual evaluation. Based on this, students will acquire a sense of what human interface means and learn the basics of presentation. Subsequently, in order to learn basic techniques and practical techniques regarding human interface, lectures on 4 themes shown in “Purposes and Objectives” below will be given. At the end, students will compile a report on proposals to improve the usability for those examples nearby that they identified at the beginning and conduct a presentation based on the design principles that they learned in the lectures. Besides conducting a mutual appraisal of one another’s presentation, students will also discuss specifically the 4 themes shown in “Purposes and Objectives” below through individual examples in each presentation.
[Course objectives] Ability to design high-usability man-machine interface, to have (1) presentation skill, (2) human interface design principle, (3) human interface design method as user-oriented design (4) user research and usability evaluation skills.
[Plans and Contents]
1. What is human interface?
2. Presentation technique 1: Basic concept of presentations
3. Presentation technique 2: Presentation techniques
4. First report presentation “Things I find easy / difficult – From my surroundings” (1)
5. First report presentation “Things I find easy / difficult – From my surroundings” (2)
6. First report presentation “Things I find easy / difficult – From my surroundings” (3)
7. Design principle of human interface
8. Human interface design: Visualization of interaction and affordance
9. Human interface design: Human errors and countermeasures (1)
10.Human interface design:Human errors and countermeasures (2)
11. Human interface design: Design principle and trade-offs in design
12. User survey methods, usability evaluation methods
13. Summary of human interface theory（The end-of-term exam）
14. 2nd report presentation “Proposal to improve usability” (1)
15. 2nd report presentation “Proposal to improve usability” (2)
16. 2nd report presentation “Proposal to improve usability” (3)
[Keywords] presentation skill, usability
[Textbooks and Reference Books] Textbook is not specified. Reference Books：Donald A. Norman, The Psychology of Everyday Things, 1988.　Donald A. Norman, The Design of Future Things, 1988.　Jakob Nielsen, Usability Engineering, 1994.

[Evaluation] Overall evaluation to be based on ordinary points such as reports and mini-tests during lessons (mini-test will be conducted at the end of each lesson to measure the level of understanding), as well as presentations (including reports) and results of end-of-term exam. The weightage of the ordinary points, presentations and end-of-term exam shall be 1:4.5:4.5 as a guide.
[Remarks] Students will be required to conduct presentations using presentation software such as Powerpoint. The number of attendances must be 11 or more for credits to be awarded.

コンピュータグラフィックス Computer Graphics

[Instructor] Norimichi Tsumura

[Credits] 2

[Semester] 3rd year-Spring Thu

[Course code]T1U034001

[Room] Bldg.Eng. 2-103

(Bldg. ENG-2 cannot be used during 2014 fall semester.)

[Course description]Lecture of computer graphics from basic to practice with text. OpenGL exercises also conducted.

[Course objectives] Computer graphics can take the real world into the machine, it is growing rapidly, involving mathematics, physics or other science and engineering fields. Students are encouraged to make a new challenge and learn its dynamism in class, and to be a self-motivated person, learn the importance of basic science through applied computer graphics.

[Plans and Contents]

1. Lecture overview, latest CG information
2. Digital camera model
3. Coordinate conversion
4. OpenGL Seminar
5. OpenGL Seminar
6. Modelling (1)
7. Modelling(2)
8. Modelling (3)
9. Rendering (1)
10. Rendering(2)
11. Rendering(3)
12. Computational photography and image processing
13. Image-based rendering
14. Animation
15. CG system, graphics processing unit (GPU), Final summary and future developments, The end-of term exam

[Textbooks and Reference Books] Get ready the following textbooks from the second lesson onwards if you are taking this course. Computer Graphics, ISBN 4-906665-48-9 B5

[Evaluation] Overall evaluation to be based on the reports submitted during lessons, reports submitted outside of lessons, result of end-of term exam etc.

ディジタル信号処理 Digital Signal Processing

[Instructor]Kazuhiko Kawamoto

[Credits] 2

[Semester] 3rd year-Spring Mon 2

[Course code] T1U035001

[Room] Bldg.Eng.2-202

(Bldg. ENG-2 cannot be used during 2014 fall semester.)

[Course description] With mobile phones or digital cameras, sensor signals are everywhere and indispensable for our lives. Digital signal processing is base technology for these devices and its fundamental articles are lectures in class.

[Course objectives] understand its algorithm to analyses Sensor signals with computers, purposes of this class are as follows （1）Understand differences between analogue signals and digital signals，able to explain strong and practical points of digital signal processing(2)Understand the significance of expressing signals by frequency domain，able to explain algorithm （such as Fast Fourier transform）used there,(3)Analyse disposition of digital filter，(4)Conduct making of easy digital filter

[Plans and Contents]

1. Signals and Systems
2. Signals and Systems Factorization of signals
3. Infinitesimal calculus of digital From Fourier series to Fourier transformation
4. An autocorrelation function and cross-correlation function Sampling model and discrete Fourier transformation
5. High-speed Fourier transformation and convolution integral theory
6. Laplace transformation
7. Interim summary
8. z-transformation
9. Finite impulse response (FIR) system (1)
10. Finite impulse response (FIR) system(2)
11. Infinite impulse response (IIR) system
12. Transfer function and frequency characteristics of linear time invariant systems (1)
13. Transfer function and frequency characteristics of linear time invariant systems(2)
14. Design of digital filters
15. Overall summary

[Keywords] Fourier series，Fourier transform，discrete Fourier transform，Fast Fourier Transform，Laplace transform, Z conversion, disintegration time system, system unchangeable at linear time, digital film

[Textbooks and Reference Books] Textbook is not specified. Handout will be provided on appropriate time.

Reference books: Reference books for the lectures include “Digital Signal Processing and Basic Theory” by Takashi Yahagi, Corona Publishing and “Digital Signal Processing” by Shigeo Tsujii et al. and others. For more detailed information, refer to “Digital Signal Processing” by A.V.Oppenheim, Prentice Hall (translated version: “Digital Signal Process I & II” by Gen Date, Corona Publishing) and “Digital Processing of Signals and Images” by Taku Arimoto, Sangyo Tosho etc.

A.V.Oppenheim 「Digital Signal Processing」 Prentice HallFor the signal representation in the first half, “the explanation in the book “Applied Mathematics for Beginners” by Kenichi Kanaya,Kyoritsu Publishing, is easy to understand.

[Evaluation] Mid-term will be in 7 th class and examination at the end of the term will be in 15th class. 50 for each exam and total of 100, students weigh total score over 60 will be accredited.

[Related courses]Fourier Transform for Information and Image Sciences, Electric Circuit Theory I/II，Digital image processing. Linear algebra, calculus

[Course requirements] Students are presumed to be taking linear algebra and calculus as well.

インターンシップ Internship

[Instructor] Yoshitsugu Manabe
[Credits] 2
[Semester] 3rd year-Spring-Fall
[Course code] T1U037001
[Room]
[Course enrollment] According to general rule, as many as possible
[Course description] Students have practical and technical training relating to the lectures of Informatics and Imaging Systems in the industry, and master the relationship of lecture and real work, job description and method by practical learning.
[Course objectives] The purpose of this lecture is to learn the ethics and actual work according to practical learning in actual industry. The student can experience the first step to the society and think about future career after graduation.
[Plans and Contents] The students have to exercise the related to Informatics and Imaging Systems technology in actual industry more than 2 weeks (60 hours).
[Evaluation] Student report(form-1)and enterprise report(form-2)are evaluated according to the above purpose and objective
[Course requirements] Do not overlap the schedule of other class. Before applying for this credits student should confirm to the enterprise or the teacher that the above purpose and objective are satisfied. The students will hand all documents (form-2 (with envelope) and letter from teaching staff (form-3) in a bag) to responsible personnel by the student before internship term begins.
[Remarks] Don’t register this class. Find your own enterprise on web or administration office or bulletin board. If there are none and still want to take this class, please ask your class teaching staff.

ソフトウェア設計論 Software Design

[Instructor] Noritaka Osawa

[Credits] 2

[Semester] 3rd year-Spring Tue 3

[Course code]T1U038001

[Room] Bldg.Eng.D2-103

(Bldg. ENG-2 cannot be used during 2014 fall semester.)

[Candidate] Students of faculty of Engineering,other Faculties, and Specially Registered Non-Degree Student.

[Course description] Study basics of software engineering, focusing on object-oriented software development

[Course objectives] To acquire ability to design and discuss software systems,and communicate with experts. (1) Understand and utilize methodologies of software engineering (2) Understand basic elements of Unified Modelling Language, and can draw and understand those diagrams (3) Understand the object-oriented paradigm, and analyze and implement systems based on the paradigm

[Plans and Contents] Lectures are planned as below to master the basic knowledge required for software development based on the object-oriented paradigm. Each lecture usually includes exercises and/or assignments to improve understanding of topics in the lecture.

1. Introduction: Software Engineering Body of Knowledge - SWEBOK
2. Process, Life cycle, Agile development
3. Project management - PMBOK, Gantt Chart, Network Diagram, EVM
4. Object-oriented paradigm
5. Java programming Language: Generics, Annotations
6. Unified modelling language (UML) UML: Structural diagrams
7. Design pattern (1)
8. Design pattern (2)
9. UML: Behavior diagrams
10. Verification and Validation
11. Software maintenance
12. An example of Agile software development
13. Internationalization and Localization
14. History
15. Summary

[Keywords] Software design, Modelling, Object-oriented, UML, Java programming language, Design patterns, Agile software development

[Textbooks and Reference Books] (1) Alan Shalloway, James R. Trott, Design Patterns Explained: A New Perspective on Object-Oriented Design,Addison-Wesley Professional (2) Erich Helm, Richard Johnson, Ralph Vlissides, John Gamma, Design Patterns: Elements of Reusable Object-Oriented Software, Addison-Wesley Professional、(3) Dan Pilone, UML 2.0: Pocket Reference, Oreilly & Associates, (4) Tetsuo Tamai, Basics of Software Engineering (in Japanese), Iwanami Shoten.

[Evaluation] Students will be assessed by results of interim and end-of-term exams (80%), and evaluations on exercises, assignments, and reports (20%).

写真創作実習　Photo creation practice

[Instructor] (Tateo Suzuki)

[Credits] 2

[Semester] 3rd year-Spring Fri 4

[Course code] T1U044001

[Room]Bldg.Eng.5-105

[Course enrollment] Department of Image Sciences・Department of Informatics and Imaging Systems each 15people

[Candidate] Department of Image Sciences,Department of Informatics and Imaging Systems

[Course description] Learn about expression in images through making works and examination of both analogue film and digital data, way of thinking, framing out and how to see lights.

[Course objectives] Using material recorded or photographed by each students（nega for film, data for digital）learn how to complete a work from a view point of sensibility

[Plans and Contents] Through creating some image works, we will learn what it is about sensibility in expression. There will be film recording fieldwork this year to consider difference between analogue images and digital image. Students will study through creating their images how to appreciate ”good　photographs” and “beauty in light”・ There will be an exhibition for the works of participating students this year. This course is about creation and expression, which examines and considers image and sensibility. We are looking forward to your splendid works with a great sensibility

1. Orientation
2. B&W film Self-portrait “My Own Existence 2014”
3. “Natural colors and forms”
4. Digital image expression 1
5. Works appreciation
6. Digital image expression 2”Paper and nails
7. ”Works appreciation
8. Digital image expression3”Momentary forms
9. ”Works appreciation
10. Work creation using Photo-Shop 1
11. Work creation using Photo-Shop 2Digital print production
12. Monocro print production (dark room operation)
13. Preparing Presentation (work publication)
14. Exhibition on works
15. General lessons

[Evaluation] Attitude towards image and work evaluation

[Course requirements] Limited to 15 students and only for students majoring in Information Image Sciences or Image Sciences. For those who wish to take this class, all candidates are asked to submit a short essay or report of around A4 sheet - 1 page - on their own thoughts on images by 15:00 P.m. 10th April (Tuesday). Reports may be submitted to: Technology and Engineering Department 8th building 4th floor KOBAYASHI&AOKI Laboratory. Admitted students will be announced on 12th April (Thursday) on bulletin board on the 2nd floor of the laboratory building.

[Remarks]　Students are to provide their own USB memory sticks for storing the photos (2G or more is preferred).

情報画像実験 III　　Laboratory Work in Information and Image Sciences III

[Instructor] Department of Informatics and Imaging Systems Staffs

[Credits] 2.0 Credits

[Semester] 3rd grade-Fall　Thu 3,4,5

[Lecture Room] Eng.D-Bld.9-206

[Code Number] T1U045001

[Teaching Methods] Experiment

[Intended Student] Only students of Department of Informatics and Imaging Systems, who is qualified to take a course.

[Teaching Outline] Students build Robots in small teams. Time race or game competition for each task is given, and the students present their strategy or idea.

[Purposes and Objectives] The purpose of this laboratory work is to learn project development in small teams. Students have to discuss strategy and objective of their team, make clear the assignment of each student and accomplish the task while communicating. Also the students cultivate presentation ability according to present their strategy or idea in front of all students.

[Teaching Plans and Teaching Contents] A team is about 6 students. Each team builds robots using LEGO Mindstorms NXT and playing Line tracer time trial and gathering game.

1. Guidance
2. Briefing, Making line tracer robot 1
3. Making Line tracer robot 2
4. Line tracer contest
5. Making gathering robot 1
6. Presentation 1
7. Making gathering robot 2
8. Making gathering robot 3
9. Preliminary round of assembly competition
10. Improving gathering robot 1
11. Improving gathering robot 2
12. Improving gathering robot 3
13. Improving gathering competition
14. Presentation 2
15. Tidying up

[Keywords] Building Robot, Project based experiment

[Textbooks and Reference Books] Texts of Experiment will be provided in the first class. Some information will be put on the Webpage on appropriate time.

[Evaluation Methods and Criteria] Game score is base point. The evaluation point of presentation from faculty and students is added to the base point, and also continuous assessment.

[Related Subjects] Graduate Research

[Requirements for Registration] 58 or more credits must be obtained for courses available until the 4th semester and end of 2nd year.

視覚情報処理　Visual Information Processing

[Instructor] Hirohisa Yaguchi

[Credits] 2

[Semester]3rd year-Fall Tue 2

[Course code] T1U046001

[Room] Bldg. GNE- H52, Bldg. ENG-2-103

(Bldg. ENG-2 cannot be used during 2014 fall semester.)

[Course enrollment] 145

[Candidate] Students of faculty of Engineering, other Faculties, and Specially Registered Non-Degree Student

[Course description] Information process of humans related to vision and visual recognition，in its psychophysical experiment，learning about information process model, in retina and each part of visual cortex，space characteristics，time characteristics，movement vision，binocular vision，function of color recognition

[Course objectives] Understand basic characteristics of information image engineering，evaluation and investigation method of human sight characteristics，to have ability to make out the hidden fact behind complex phenomena.

[Plans and Contents] Students are encouraged to take interest in how humans see the world. Lecture on how the mechanism of vision is efficient and adoptivein relation to information image engineering

1. What is the sense of vision? Essense of visual understanding
2. What is the sense of vision? Means of visual understanding
3. Eyeball structure? Eyeball optics system and retina
4. Eyeball structure? Eyesight and image formation
5. Photoreceptor and sampling
6. Dark adaptation, light adaptation and photoreceptor response
7. Spatial property and retina cells
8. Peripheral vision and retina non-uniformity
9. Spatial frequency characteristics of visual systems
10. Form perception and frequency characteristics
11. Cerebral visual cortex and spatial frequency characteristics
12. Temporal frequency characteristics
13. Color vision
14. Motion vision
15. Stereoscopic vision

[Keywords] Sight information processing, retina, cerebrum visual cortex

[Evaluation] Attendance (25%), reports (25%) reports and the results of exams will be given a total of 60 points and above being considered a pass.

[Remarks] Note that students enrolled before 2003 will not be able to obtain graduation credits even if they were to take this course.

データベース　Data　Base

[Instructor]Kouji Kajiwara

[Credits] 2

[Semester] 3rd year-Fall Mon 5

[Course code] T1U048001

[Room] Bldg.Eng. 2-102

(Bldg. ENG-2 cannot be used during 2014 fall semester.)

[Course objectives]　Lecture has two themes, “data representation” and “Data operation” of Data processing function of computers and for each theme, there will be systematic description from ”data representation” to ”record representation” then to ”representation between records”。

[Plans and Contents] Development of data processing function, data representation method，record representation method, representation between records，record and file，sequential file，direct file，indexed sequential file，overview of database, data model in general，internal representation of data，independence of data and How to use data base system.

[Evaluation]Evaluation will be given by report writing and examination

生体情報システム論 Biological Information System

[Instructor] Ikuo Matsuba
[Credits] 2
[Semester] 3rd year-Fall　Mon 4
[Course code] T1U049001
[Room] Bldg.Eng.17-211

[Course description] Lecture of information process and neural network in organ

[Course objectives] Organic bodies are ideal information processing computer．Visual sensor system，brain　neural system and their information process，practice to engineering and neural network deriving from brain neural circuit model.

[Plans and Contents] Brain and computer，　basic information process in organ system，sensing system and visual system，retina，visual cortex，characteristics like lateral inhibition, of sight system information process，Mach effect，information content of discharging and brain content，neural structure of internal neural system，system theory and brain theory，information theory, neural circuit network statistics，excitatory circuit network, prohibiting circuit network，logic neuron and circuit, characteristics of information process in neural network, association, statistic calculation of content, learning machine and perceptron，　neural　circuit network in aspect of optimization search，organ information system in engineering.

1. Overview of the brain
2. Functions of nerve cells
3. Visual information processing 1
4. Visual information processing2
5. Memory and memory capacity
6. Statistics of biological neural networks
7. Logical neurons
8. Associative memory and memory capacity 1
9. Associative memory and memory capacity 2
10. Associative memory and memory capacity 3
11. Learning machine and perceptron 1
12. Learning machine and perceptron 2
13. Unsupervised learning
14. Neural network applications 1
15. Neural network applications2

[Keywords] Neural Networks，Biological Systems，Visual System，Associative Memory，Learning Machine

[Textbooks and Reference Books]　！！IMPORTANT！！Material will be uploaded on web and must print out to bring to class．Reference Books：Matsuba, Neural System Information Process，Shokodo

[Evaluation] Evaluation will be given by examination attendance and report writing.

[Course requirements] must be taken the courses probability and statistics

[Remarks] Must download the material and bring the copy to the class（material,2）from http://www.geocities.jp/complex lab2005

ディジタル画像処理Digital image processing

[Instructor] Takahiko Horiuchi

[Credits] 2

[Semester] 3rd year-Fall Wed 4

[Course code] T1U050001

[Room] Bldg.Eng2-102, Bldg.Eng17-113

(Bldg. ENG-2 cannot be used during 2014 fall semester.)

[Course description] This course presents the fundamentals of digital signal processing which is necessary for information and imaging system design, computer vision, and computer graphics by mainly focusing on the color image processing.

[Course objectives]

Introduce the students to the fundamentals of digital image processing and provide them with the essential knowledge about the main themes, so that, the students will be able to create programs.

The specific objectives are as follows:

(1) Understanding input and output methods of digital images.

(2) Understanding differences between binary, color, and multi-spectral images.

(3) Understanding simple image processing in the image and the frequency spaces, and implementing it.

(4) Applying their knowledge to a three-dimensional image processing and video image processing.

Review what we studied for the exam and confirm the achievement of the target.

[Plans and Contents]

1. Overview
2. 2 Input and output of images
3. Image space and frequency space
4. Spectral image and color image
5. Digital halftoning
6. Image coding
7. Image quality improvement (1)
8. Image quality improvement (2)
9. Binary image processing
10. Feature extraction
11. Three-dimensional image processing
12. Video processing
13. Image recognition
14. Image processing practice
15. Summary and The end-term exam

[Textbooks and Reference Books] Hideyuki Tamura, “Computer Image Processing”, Ohmusha.

[Evaluation] Evaluation given by Report writing (50%) and End term exam (50%)

[Related courses] Visual Information Processing. Processing and Analysis of Color Image. Theory of Image Analysis System. Images and Human Sensitivity. Image Electronics. Digital Imaging System. Fourier Transform for Image. Pattern Recognition. Digital Signal Processing. Computer Graphics. Information Theory.

[Course requirements]

Students should preferably be taking courses like “Visual Information Processing” and “Processing and Analysis of Color Image”.

リモートセンシング工学 **Remote Sensing Technology**

(Undergraduate・An open course to the students of Chiba Institute of Technology)
[Instructor] Hiroaki Kuze, Josaphat Tetuko Sri Sumantyo, Naoko Saito
[Credits] 2
[Semester] 3rd year-Fall Fri 2
[Course code] T1U052001
[Room] Bldg.Eng. 5-104
[Candidate]Students of faculty of Engineering,other Faculties, and Specially Registered Non-Degree Student s.
[Course description] Lecture on information extraction in environmental remote sensing including its technological basis, given by staffs of the Center for Environmental Remote Sensing (CEReS).
[Course objectives]To learn about (1) satellite remote sensing, (2) trans-discipline aspects of remote sensing, (3) analysis of satellite imagery to extract environmental information, and (4) microwave remote sensing. The general goals for the students are to be able to (1) explain remote sensing in the terms of science, and (2) consider the application of remote sensing to environmental measurements.
[Plans and Contents] Remote sensing technology overview, how remote sensing provides environmental information, major applications, data processing, remote sensing and atmosphere, basic physical processes, ground validation, monitoring of earth surface coverage, principle of microwave remote sensing, and other topics related to environmental remote sensing. Although preparatory knowledge is not mandatory, students are expected to be interested in observation of Earth's environment, both from satellites and ground activities, as well as data processing.
(The following schedule and contents are subject to change.)

1. Guidance - Remote sensing and earth monitoring
2. Atmospheric radiation and satellite measurement of trace gases
3. Satellite remote sensing using visible light
4. Satellite observation of vegetation
5. Earth environment monitoring and global warming
6. Atmospheric monitoring - ozone layer and air pollution
7. Processing of satellite imagery
8. Black body radiation, solar spectrum and radiation from the Earth
9. Air molecules and aerosol particles - how they are related to global climate change
10. Introduction to synthetic aperture radar (SAR)
11. Various kinds of synthetic aperture radar systems
12. Radar equation and microwave signal processing
13. Pulse compilation - SAR image formation
14. SAR image analysis
15. Future development of environmental remote sensing

[Textbooks and Reference Books] The following reference books are recommended. Refer to them when necessary in accordance with your own interest. "Remote Sensing - An Introductory Textbook", ed. by The Remote Sensing Society of Japan, ISBN 978-4-86345-185-8 Marzen Planet, 2013; W.G. Rees, "Physical Principles of Remote Sensing, 3rd edition", Paperback ed., ISBN 978-0521181167, Cambridge University Press, 2012; I. H. Woodhouse , "Introduction to Microwave Remote Sensing", ISBN 978-0415271233, CRC Press, 2004; D. J. Jacob, "Introduct ion to Atmospheric Chemistry", ISBN 978-0691001852, Princeton University Press, 1999.
[Evaluation] Attendance・Report writing

心理物理学　Psychophysics

[Instructor] Naokazu Aoki

[Credits] 2

[Semester] 2nd year-Fall, Wed 3

[Course code] T1T059001

[Room]General study building A-4F: Data processing room 2

[Course description] Psychophysics is the scientific study of the relation between physical stimuli and their subjective correlates, or percepts, to study the effect on a subject's experience or behavior of systematically varying the properties of a stimulus. Psychophysical function or brain function. Signal detection theory and psychophysical scaling, perception, learning, and behavior problems are solved. It has been able to applicable to many variety of field of science and technology. Lecture on application and utilization of psychophysics methods in the some image fields. And task with related problems, measurement and experiment.

[Course objectives] Understand relations of image and visual information, organ information, perception, recognition. Conduct some psychophysical experiments and statistical data processing and analyses in quantitative point of view.

[Plans and Contents]To explain about a psychological concepts and psychophysics.

1. The summary
2. The statistics basics
3. Regression analysis
4. Analysis of variance・ Experimental design
5. Classical Psychophysical methods・The measurement of the sensitivity
6. Detection & Discrimination
7. Signal detection & ROC curves
8. Comparison judgment
9. Magnitude estimation・Psychometric function
10. Scaling
11. Ratio scaling
12. Two-alternative forced choice method・Standardized rank method
13. Factor analysis
14. Semantic Differential
15. Application of psychophysics
16. Examination（Bring scientific calculator ）

[Keywords] Psychophysics, Perception, Semantic Differential

[Textbooks and Reference Books] “Psychophysics”: F.A.A. Kingdom & N. Prins, Academic Press (2010)

[Evaluation] Evaluated by data analysis of the psychophysics, a problem about the item about the statistical analysis and the psychophysics experiment problem and the term-end examination about the required item.

[Related courses] Visual Information Processing (T1T038001), Multivariate Analysis (T1U023001)

[Course requirements] Nothing in particular

工業システム概論 Industrial System Engineering

[Instructor] (Natsuki Saikawa)

[Credits] 2

[Semester] 4th year-Spring Mon 4

[Course code] T1U060001

[Room] Bldg. Eng2-101

(Bldg. ENG-2 cannot be used during 2014 fall semester.)

[Candidate] Students of faculty of Engineering, other Faculties, and Specially Registered Non-Degree Students

[Course description] Today's business activities case studies focusing on aspects of the use of IT, risk management, information security. Learning about cloud computing and autonomous decentralized system as an example of the application system. Risk management, information security are essential for the society today. Looking at specific examples, students will understand system in contemporary society and industrial activity

[Course objectives] Today's business activities case studies focusing on aspects of the use of IT, risk management, information security. Learning about cloud computing and autonomous decentralized system as an example of the application system. Risk management, information security are essential for the society today. Looking at specific examples, students will understand system in contemporary society and industrial activity

[Plans and Contents] There will be case study to understand concepts to apply to industrial activities in Contemporary system. Case study of production management system for manufacturing industry (iron and steel industry, automobile industry)

Flow of lecture, manufacturing system

1. Corporate social responsibility, risk management
2. Production management system of steel industry (1)
3. Production management system of steel industry (2)
4. Use of autonomous distribution system (1)
5. Use of autonomous distribution system(2)
6. Production management system of car industry (1)
7. Production management system of car industry(2)
8. Use of cloud computing
9. Cloud computing risks
10. Corporate risk management system
11. Risk assessment
12. Corporate information security(1)
13. Corporate information security(2)

15. The end -of term exam

[Keywords]

Production Control System、Autonomous Distributed System、Social Responsibility Management System、Risk Control、Information Security、 Cloud Computing

[Textbooks and Reference Books] Listed on the website below. http://www.geocities.jp/complex lab2005

[Evaluation] Evaluation is given by Attendance, Reports, and Exams. [Course requirements]

None

[Remarks] Evaluation is given by Reports, and Exams.

画像技術史 Development of Imaging Technology

[Instructor] Tetsuro Kuwayama

[Credits] 2

[Semester] 4th year-Spring Wed4,5

[Course code] T1U061001, T1U060002

[Room] Bldg. Eng.2-202

(Bldg. ENG-2 cannot be used during 2014 fall semester.)

※Basically, the lecture will be held 4 and 5 period on Wednesday every other week.

[Course enrollment] No limit

[Candidate]Students of faculty of Engineering, other Faculties, and Specially Registered Non-Degree Students.

[Course description] At this lecture, it aims deep understanding from various angles on the theme of "What is a picture." Questions are welcome within and after lectures.

[Course objectives] Digital imaging technology is rapidly progressing, and various imaging devices have appeared. It is useful to go back to foundations and to think the principle question “What is image” in history of technology. At this lecture, an understanding of to the whole imaging technology is deepened using the viewpoint of the history of technical.

[Plans and Contents] (1) Introduction of information image technology history and significance / What is image ? / Integrated understanding of “recording” and “communication”, (2) Problem of “size” and “shape” in images part 1 / perspective and its history, (3) Problem of “size” and “shape” in images part 2 : Anamorphosis, (4-6) Depth component : Stereo photography and stereo image, holography, various 3-dementional imaging technology, (7-9) Movement component : thaumatrope, phenakistoscope, invention of cinema, and the history of television, (10-11) Capture and reproduction of brightness in photography and printing, black area on television image, (12-14) Capture and reproduction of color component : The history of color theory history, color photograph, color printing, color television, (15) The conclusion of all the lectures : ”What is image ? :

[Textbooks and Reference Books] Handouts provided in lecture

[Evaluation] A simple report shall be submitted for every lesson. Evaluation is based on attendance and the contents of reports.

[Course requirements] None in particular

[Remarks] In 2014, lecture is held on every other Wednesday 4th and 5th period, from April 17. There may be changes in the schedule and please check the web site or ask by mail.

[Keywords]

Color television Anamorphosis Thaumatrope Phenakistoscope Praxinoscope Stereoscope Invention of moving picture

広報媒体論 Study on Mass Media

[Instructor] (Masashi Wada)

[Credits] 2

[Semester] 4th year-Spring Fri 3

[Course code]T1T062001

[Room] Bldg. Eng- 9-106

[Candidate] The person who are interested in social communication and media business by the advertising revenue models and the latest information technology (IT), and who attempt to study about the marketing communication theories and media sociologies. Students in the other departments in this faculty and the Specially Registered Non-Degree Student are also very welcome.

[Course description] Marketing communications including the advertising and PR (Public Relations) activities are very old media business. “Publicity” started as ”cryouts” in Babylonian oral information, handmade posters, then came the mass media age, which includes the printed media (papers and magazines) , the electric-communication （telephone, telegrams）, and the broadcasting（radio, TV）. The mobile and internet media are rapidly emerging today. In this class, we will discuss the media technologies and business development, the changes of contents and commercial messages, and the today’s digital media business or media environment in our social life.

[Course objectives] [general]：After attending this class, you will able to : Be familiar with the history of advertising and PR media technology’s changes, have a good understanding of media technologies and business, know the difference between advertising and PR. [specific] ：Overview of the printing to electronic papers, the publicity media changes, the largest media “TV advertising” business, the theories on audio-visual communication analysis, and the advertising effect theories. The discussion will include such the latest technologies like mobile, net movie, SNS, Buz/ WOM communications, and the so-called content marketing.

[Plans and Contents] The schedule and content are subject to alteration.

1. Guidance: Current situation of the information media industry and advertising business
2. 4,000 years of history in advertising, public relations and journalism – In tandem with the development of media technologies
3. From Gutenberg printing (15th century) to the advent of electronic books (2010)
4. Media as a “telephone” and “radio” – Communication business and advertising broadcast model (free model)
5. Post-war expansion of Japanese broadcast media and advertising market – Commercial broadcasting and commercial TV and terrestrial digital broadcasting
6. Short history of TV CM (1) 1953-1974 – Expression trend towards rapid growth from the beginning
7. Advertising strategy of images and videos and measurement of effects – Ratings survey system and DAGMAR theory
8. Low involvement theory” of TV CM and buying behavior model
9. Short history of TV CM (2) 1975- 1995 – After TV advertising surpassed print advertising
10. Single source concept and “Big Data” age – Integration of POS system (buying) and ratings (contact)
11. Short history of TV CM (3) 1995-2010 – Imaging environment after the commercialization of the Internet
12. TV media theory based on IMC (Integrated Marketing Communications) and brand theory
13. Media theory of OOH (Out Of Home), mobile and digital signage
14. Internet & Web2.0 – Media theory of CGM (Consumer Generated Media)
15. Contact point and cross media – Considering a new media, eco-system

[Keywords] communication, media, technology, technology and society, advertising and public relations

[Textbooks and Reference Books] Not specified in particular. Lesson materials shall be distributed for each lesson and required reference books and publications will be introduced on each occasion.

[Evaluation] Submission of final report (70%) and minute paper during lessons (about 6 times: 30%)

Statistical analysis and the psychophysics experiment problem and the term-end examination about the required item.

[Related courses] Visual Information Processing (T1T038001), Multivariate Analysis (T1U023001)

[Course requirements] Nothing in particular

メディアアート Media Art

[Instructor] Shigeru Ssto

[Credits] 2

[Semester] 4th year-Spring Intensive

[Course code] T1T064001

[Room] Bldg.Eng.9-206

[Course description] This course is designed to provide a basic understanding of expression techniques in visual media like Film, TV and Video, such as photographing, editing and color grading. Additionally practical training is given to learn basic knowledge and skills for movie making.

[Course objectives] The purpose of this course is giving students knowledge about how to read creator's intention from the visual contents. This may inspire students to use visual media as a means of self-expression.

[Plans and Contents]Lecture and Practical Training. In the lecture, expression techniques such as photographing (angle, frame size, camera position), POV shot, visual guidance, light, editing (continuity editing, montage, etc.) , texture of the film (color grading), compositing and sound will be discussed. In practical training, theme-based exercise with computer will be conducted to learn basic skills for movie making.

[Keywords] visual media expression, movie making, film grammar

[Textbooks and Reference Books] None in particular

[Evaluation]Overall evaluation to be based on topics and tests conducted during the lessons and attendance.

[Remarks] Expected start date: September 1st-5th 2014

ディジタル映像システム Digital Imaging System

[Instructor] Toshiharu Kurosawa

[Credits] 2

[Semester] 4th year-Fall Intensive

[Course code] T1U065001

[Room] Bldg.Eng. 9-206

[Course description] Overview on digital technology and development of Audio Visual image system, with changes in society, characteristics in recent digital AV system structure and characteristics of images AV process technology and high-end including recent topic

[Course objectives] Looking at the evolving digital AV system from basic to high-end, interactive course to deeper understand way of thinking and research ability necessary for engineering.

[Plans and Contents] digital technology has various elements of technology and evolving fast with AV system changing from analogue to digital. TV changes from terrestrial to digital, in its beginning of 2006, started pursuit of more beautiful expression of AV, TV and PC media mix and networking. AV material recorded digital, edited on digital, more convenient, compiled and transported, they are everywhere and always new.　Looking over development of digital AV system, looking at the most familiar AV device, TV, from analogue technology to digital technology, change in AV device with the society of digital, AV system structure, digital AV format, digital AV encoding, technology, input/output AV device, its basic and characteristics, digital AV process technology and hi-end technology, patent rights from basic to applied to hi-end technology will be discussed, Will the organic EL make the history of TV? Will the 3rd wave of 3dtv come to our daily lives? What comes next to world war for standardization? How far can TV go?

[Keywords] digital imaging system, digital image processing, video encoding, video quality assessment, imaging devices. TV display, standardization

[Evaluation] Evaluation based on attendance record, participation record, report score.

[Remarks]

Toshiharu Kurosawa (Part-time, ex-Matsushita Electric Industries, Coordinator: Norimichi Tsumura) The schedule for 2014 will be informed.

卒業研究 Graduate Research

[Instructor] Hirohisa Yaguchi

[Credits] 8

[Semester]4th year-Spring-Fall

[Course code] T1U066001

[Room]

[Course objectives] Aims at information Department of images each course objectives and targets an important subjects and articles, to improve overall both in terms of practical competence, research competence.

[Plans and Contents] Teaching each student belonging to the lab, doing research about certain themes. Instructions to research from each teaching staff. Final presentation of graduate, and will be evaluated individually.

To evaluate the research implementation of standards and assessment methods, papers,and presentations. Differ by the year of entrance, please check the curriculum.

[Evaluation] Evaluation to be based on contents of research, thesis and presentation.

[Course requirements]Differs by year of enrolment, to be determined by courses taken.

画像電子機器工学 Image Electronics

[Instructor](Fumio Nakaya)
[Credits] 2
[Semester] 4th year-Fall Intensive
[Course code] T1U068001
[Room] Bldg.Eng.2-202
(Bldg. ENG-2 cannot be used during 2014 fall semester.)
[Candidate] Students in other departments in the own faculty may take this course.
[Course description] Lecture for input devices such as color scanners and digital cameras, soft copy devices such as display and projector, hard copy devices such as printer and copier, needed for color imaging, practical trainings focusing on colorimetric reproduction method focusing linear theory and further explaining the application of color management.
[Course objectives] In the recent years, digitalization of equipment for image information, digital color devices, such as scanners, cameras, video equipment and printer are spreading rapidly. Objective of the class is to acquire concepts and basic knowledge of color reproduction which enable the practice of color management for the input/output devices. Therefore students will be able to challenge real problems in image electronics.
[Plans and Contents] Following 3 themes for each intensive course: 1. Principle of color reproduction, Objective of color reproduction, Vision, Grassmann's law, Color matching function and Luther condition, Standard observer and Standard light source, Object color, Uniform color space, Color mixing principle, Lambert Beer’s law & Neugebauer equation, 2. Principle of color image duplication, Color reproduction of scanner, display and hardcopy, Color correction, Color adjustment, RGB to CMYK conversion, 3. Color management and relating standard, Color appearance model, CIECAM02, Evolution of color difference formula, CIEDE2000, Standard color space, sRGB, opRGB, PRMG, etc., Color gamut mapping algorithm, GMA, Multispectral imaging.
[Keywords] color reproduction, color management, color imaging
[Textbooks and Reference Books] Joji Tajima, Color image reproduction theory, Fundamental of color management, Maruzen. A handout will be distributed
[Evaluation] Attendance (40%), homework (10%), reports (50%)
[Remarks] Intensive Lecture：The start date for the lectures in 2014 is as follows.

情報画像産業汎論 Introduction to Information and Imaging Industry

[Instructor] Each teacher

[Credits] 2.0 Credits

[Semester] 3rd grade-Fall Fri 5

[Code Number] T1U069001

[Lecture Room] Bld.Eng17-113

[Teaching Methods] Lecture

[Class Enrollment] 100

[Teaching Outline] Specially invited speakers will give lectures advanced topic related to information and imaging industry. All the speakers are active researchers/engineers in the enterprises related to information and image industries.

[Purposes and Objectives] Understanding recent trends in image and related technology and industry. Lectures by top researchers/engineers in information/image-related industries will deepen and fix your knowledge about information and image science.

[Teaching Plans and Teaching Contents] Researchers and engineers who all work actively in information/imaging and the related industries will introduce advanced topics in their fields weekly in a lecture style.

1. Guidance (Attn: corresponding teacher)

2 - 15. Lectures by specially invited speakers.

[Keywords] Information and Image Science, Information and Image Industries

[Evaluation Methods and Criteria] Write a report on the lecture in last 10 min of every lecture. Attendance and the reports will be evaluated

[Remarks] Candidates should pay attention to the latest information about this class. The information will be given through e-mail and the bulletin board.

造形演習　Design Aesthetics(Lab.)

[Instructor] UEDA Akira
[Credits] 2
[Semester]1st year-Spring-Tues 5
[Course code] T1Y016001
[Room] Bldg.Eng.2- 201
[Course description] Engineering is manufacturing, and manufacturing is a formative activity. The Design Aesthetics (Lab.) course aims to evoke students' interest in Engineering = manufacturing through several formative design projects and to awaken the individual talents in formative arts.
[Course objectives]　Specific objectives of this course are as follows: (1) to cultivate the attitude to learn; (2) to develop multilateral observation skills; (3) to recognize the existence of various solutions; (4) to enhance presentation skills. In the Design Aesthetics (Lab.) course, students are required to challenge each of these 4 assignments, and continue until they achieve satisfaction. Students will learn to associate their brain and hands, and "move their hands, work up a sweat, let imagination loose, and create."
[Plans and Contents]

1. Overall guidance.
2. Assignment 1: Precision drawing using a pencil.
3. Assignment 1: Seminar.
4. Assignment 1: Criticism.
5. Assignment 2: Drawing of a solid object based on the elevation drawing.
6. Assignment 2: Seminar.
7. Assignment 2: Criticism.
8. Interim presentation
9. Assignment 3: Production of a tabletop lamp shade.
10. Assignment 3: Seminar.
11. Assignment 3: Criticism.
12. Assignment 4: Modeling of flying object.
13. Assignment 4: Seminar.
14. Assignment 4: Criticism.
15. Exhibition, summary, and criticism.

[Keywords] Observation, Thinking, Design, Presentation
[Textbooks and Reference Books] Not particularly.
[Evaluation] Evaluation is given by attendance works, and presentation.
[Related courses] Not particularly
[Course requirement]　Not particularly
[Remarks] Not particularly

造形演習　Design Aesthetics(Lab.)

[Instructor] Tauchi Takatoshi
[Credits] 2
[Semester] 1st year-Spring-Tues 5
[Course code] T1Y016002
[Room] Innovation Plaza, Faculty of Engineering
[Course objectives] When awareness towards an issue leads to some form of result by an engineering means, making something with a better organized form in mind and making something without such cognition will produce very different results. Through exercise, students will learn what better organized forms are. In specific, students will be given assignments for each item shown in the course plan based on the specialized areas of the faculty member.
[Plans and Contents]
1. Overall guidance.
2. Assignment 1: Pencil sketch of a hand.
3. Assignment 1: Seminar.
4. Assignment 1: Seminar・Criticism.
5. Assignment 2：:Sketch of a solid object based on the three orthographic views.
6. Assignment 2: Seminar・Criticism
7. Assignment 3：Production of elastic band driven car.
8. Assignment 3: Seminar: Presentation of work based on the research findings.
9. Assignment 3: Production
10. Assignment 3: Presentation.
11. Assignment4: Production of a paper sandal.
12. Assignment4:： Presentation of work based on the research findings.
13. Assignment4: Production
14. Assignment 4: Presentation.
15. Exhibition and criticism.

[Evaluation] Evaluation is comprehensively given by attendance, works, and the quality of presentation.
[Remarks] Wearing sandals and high-heeled shoes are strictly prohibited in Innovation Plaza, Faculty of Engineering

造形演習　Design Aesthetics(Lab.)

[Instructor] TAMAGAKI Yoichi, SHIMOMURA Yoshihiro
[Credits] 2
[Semester] 1st year-Spring-Tues 5
[Course code] T1Y016003
[Room] Bldg.Eng.2–atelier(2–601)
[Course objectives] When awareness towards an issue leads to some form of result by an engineering means, making something with a better organized form in mind and making something without such cognition will produce very different results. Through exercise, students will learn what better organized forms are. In specific, students will be given assignments for each item shown in the course plan based on the specialized areas of the faculty member.
[Plans and Contents]
[Evaluation]

造形演習　Design Aesthetics(Lab.)

[Instructor] YOSHIOKA Yosuke
[Credits] 2
[Semester] 1st year-Spring-Tues 5
[Course code]　T1Y016004
[Room] Bldg.Eng.2. 1- 110
[Course objectives] When awareness towards an issue leads to some form of result by an engineering means, making something with a better organized form in mind and making something without such cognition will produce very different results. Through exercise, students will learn what better organized forms are. In specific, students will be given assignments for each item shown in the course plan based on the specialized areas of the faculty member.
[Plans and Contents] [Evaluation]

造形演習　Design Aesthetics(Lab.)

[Instructor] UEDA EDILSON SHINDI
[Credits] 2
[Semester] 1st year-Spring-Tues 5
[Course code]: T1Y016005
[Room] Bldg.Eng.2 102
[Course enrollment] 60
[Candidate]Students of faculty of Engineering, other Faculties, and Specially Registered Non-Degree Student
[Course description] Engineering is manufacturing, and manufacturing is a formative activity. The Design Aesthetics (Lab.) course aims to evoke students' interest in Engineering = manufacturing through several formative design projects and to awaken the individual talents in formative arts.
[Course objectives] When awareness towards an issue leads to some form of result by an engineering means, making something with a better organized form in mind and making something without such cognition will produce very different results. Through exercise, students will learn what better organized forms are. In specific, students will be given assignments for each item shown in the course plan based on the specialized areas of the faculty member.
[Plans and Contents]
1. Overall guidance.
2. Assignment 1: Precision drawing using a pencil.
3. Assignment 1: Seminar.
4. Assignment 1: Criticism.
5. Assignment 2: Drawing of a solid object based on the elevation drawing.
6. Assignment 2: Seminar.
7. Assignment 2: Criticism.
8. Interim presentation
9. Assessment 3: Select a theme from water, fire, soil, or wind, and freely create a form
10. Assignment 3: Seminar.
11. Assignment 3: Criticism.
13. Assignment 4: Seminar.
14. Assignment 4: Criticism.
15. Exhibition
[Keywords] Observation, Thinking, Design, move their hands, work up a sweat, k Presentation
[Textbooks and Reference Books] Not particularly

[Evaluation] Evaluation is given by attendance, works and quality of presentation. Attendance 40%, Presentation 60%.

[Related courses] Not particularly

[Cours requirement] Not particularly

[Remarks] Not particularly

工業技術概論 Introduction to Industrial Technologies

[Instructor] Yun Lu
[Credits] 2
[Semester] Spring-Mon5
[Course code]T1Z05400
[Room] Bldg.Eng.2.17-111
[Candidate] All Students of Faculty of Engineering, other Department's Students
[Course description] First, the course will discuss the development of global industrial technologies with focus on Japanese technologies, changes of people's lives caused by technologies, environment and energy situations, and the history, current situation and future of industrial technologies. The course will also provide lectures on the necessary mindset as industrial engineers, resource research, how to write technical papers, and how to give research presentation, as well as guidance on studying and report writing techniques for students majoring in science and engineering.
[Course objectives] The objective is to increase the understanding of foreign exchange student majoring in science and engineering towards the development of industrial technologies and changes of people's lives caused by technology development, environment and energy situations, and to teach students the basic abilities that are required as industrial engineers (mindset, resource research, how to write technical papers, and how to give research presentation, etc.) as well as guidance on studying and report writing techniques for students majoring in science and engineering. At the same time, the course is aimed to enable foreign exchange students to gain a better understanding on the industrial technologies of Japan and to acquire the ability to contribute to the development of industries and technologies in their home countries or to work in Japanese companies in the future.
[Plans and Contents] The lectures will be given in 2 parts. Part 1: History, current situation and future of industrial technologies (Classes 1 – 9), and Part 2: Path to becoming a researcher. To ensure a better understanding, lecture resumes will be distributed on the web and lectures will be given using a projector. Achievements will be evaluated by reports and presentation (Classes 10 – 15).

1. Orientation and discussion about course content
2. Advances in industrial technology worldwide
3. Advances in industrial technology in Japan
4. Unique industrial technology
5. Industrial technology and life
6. Industrial technology and energy, the environment
7. 21st century industrial technology
8. How to write a report
9. Assignment presentation 1
10. Basic R&D thinking 1
11. Basic R&D thinking 2
12. Resource research
13. How to write a technical paper
14. Research presentations
15. Research presentations 2
16. Research presentations 3

[Textbooks and Reference Books] Textbook is not specified. Handouts will be provided via http://apei.tu.chiba-u.jp/Luyun-HP.html. Reference books will be introduced in class time.
[Evaluation] Attendance (30%) and exercises, report (30%) and presentation (40%), the total score 60 accredited.
[Course requirement] Not particularly
[Remarks] Foreign students only, the choice subject (F30 or F36) and no credit for Japanese students（Z99）.

居住のデザインと生活技術 Dwelling Design and Living Technology

[Instructor] Yun Lu

[Credits] 2

[Semester] Fall-Fri 4

[Course code] T1Z055001

[Room] Bldg.Eng.2.17-213

[Course enrollment] about40

[Candidate]Students of faculty of Engineering,other Faculties, and Specially Registered Non-Degree Student s.

[Course description] This course will be led by grand fellow Atsushi Maruyama.

[Course objectives] In the life of a person, there are various schemes being repeated in our given environment, the various designs that lead to scales of city or region from around us cannot be done elsewhere. For foreign students aiming to go to form a professional environment, firstly, they need to focus on design and life skills for such residence, then think of the parallel development, also, in the present, they need to understand what is being deployed.

[Plans and Contents] We would like to discuss, in seminar format, examples of native students not only in the case in Japan, regarding the technology and lifestyle design for residential, and deepen the understanding. There are also plans of visits outside the university during the term.

1. October 3 – Orientation: What does “living” mean? How have people designed living spaces thus far?
2. October 10 – What types of houses can be found now in Japanese urban and rural areas?
3. October 17 – What types of houses can be found in Japanese historical rural and fishing areas?
4. October 19 (Sunday) – On-site observation: Boso Hudokinooka Open air Museum. (Bus tour)
5. October 24 – What types of houses can be found in Japanese historical urban areas?
6. November 7 – What trends have been seen in designing dining spaces kichen and family room?
7. November 14 – What trends have been seen in designing drawing rooms to allow for social relationships?
8. November 21 – What trends have been seen in designing amusement spaces for Noh and Kabuki?
9. November 28 – What trends have been seen in designing amusement spaces in Tokyo Disney land?
10. December 5 – How people have designed tea houses and Sukiya houses facing four seasons and nature?
11. December 12 – How people have designed tea gardens and imperial villa facing four seasons and nature?
12. December 19– How people designed religious spaces in dwelling houses and community during Bon and Shogatsu?
13. January 9 – How people designed religious spaces, Temples and Shrines in community?
14. January 23 – How people designed religious monument such as five storied pagodas ?
15. January 30 – Summary and Overall Discussion

[Keywords] Dwelling house, Design, Living Technology, Mealtime, Relationship, Religious Belief

[Textbooks and Refrence Books] Textbook is not specified. Reference books will be introduced with the process of class on appropriate time.

[Evaluation] Evaluation will be given by small questionnaire with attendance sheet, presentation of the report in seminars at each research room, and the final report.

[Course requirement] Not particularly

[Remarks] Foreign students only, subject of choice（F30 or F36）and no credit for Japanese students（Z99）