Syllabus

International Master's Degree Program (2015-Fall Term)

(M40030040)Culture and Communication II[Culture and Communication II]

| Subject name[English] | Culture and Communication II[Cult | ture and Commur | nication II] | | |
|-----------------------|-----------------------------------|-----------------|--------------|-------------|----------|
| Schedule number | M40030040 | Subject area | General | Required or | Elective |
| | | | courses | elective | |
| Time of starting a | Fall term | Day of the | Thu.5~5 | Credit(s) | 2 |
| course | | week,period | | | |
| Faculty | Graduate Program for Master's De | egree | | Subject | 1~ |
| | | | | grade | |
| Department Offered | Common | | | Beggining | M1, M2 |
| | | | | grade | |
| Charge teacher | 池松 峰男 IKEMATSU Mineo | | | | |
| name[Roman alphabet | | | | | |
| mark] | | | | | |
| Numbering | | | | | |

Objectives of class

After completing the course, students should be able to discern there is no decisive methods for language learning, but a consensus on the need of large amount of input.

After completing the course, students should be able to discern there is no decisive methods for language learning, but a consensus on the need of large amount of input.

Contents of class

Weeks:

- 1. Introduction / Language, Learning and Teaching 1
- 2. Language, Learning and Teaching 2
- 3. First Language Acquisition 1
- 4. First Language Acquisition 2
- 5. Age and Acquisition 1
- 6. Age and Acquisition 2
- 7. Human Learning
- 8. Styles and Strategies
- 9. Personality Factors
- 10. Sociocultural Factors
- 11. Catch up
- 12. Cross-Linguistic Influence
- 13. Communicative Competence
- 14. Second Language Acquisition -General-
- 15. Second Language Acquisition -The Input Hypothesis-

Weeks:

- 1. Introduction / Language, Learning and Teaching 1
- 2. Language, Learning and Teaching 2
- 3. First Language Acquisition 1
- 4. First Language Acquisition 2
- 5. Age and Acquisition 1
- 6. Age and Acquisition 2
- 7. Human Learning
- 8. Styles and Strategies
- 9. Personality Factors
- 10. Sociocultural Factors
- 11. Catch up
- 12. Cross-Linguistic Influence
- 13. Communicative Competence
- 14. Second Language Acquisition -General-
- 15. Second Language Acquisition -The Input Hypothesis-

Self Preparation and Review

Download and use the materials on a cloud drive. Material-uploading will be done before each class and occasionally after the

class when needed. Details on preparation will be given at the beginning of the course.

Download and use the materials on a cloud drive. Material-uploading will be done before each class and occasionally after the class when needed. Details on preparation will be given at the beginning of the course.

Related subjects

Notes for textbook

| Reference 1 | Book title | Principles of Langu | uage Learning and | d Teaching | ISBN | 0-13- |
|-------------|------------|---------------------|-------------------|------------|--------------|----------|
| | | | | | | 017816-0 |
| | Author | Brown, H. | Publisher | Longman | Publish year | 2000 |
| | | Douglas | | | | |
| Reference2 | Book title | Second Language | Acquisition | | ISBN | 0-19- |
| | | | | | | 437212 X |
| | Author | Ellis, Rod | Publisher | Oxford | Publish year | 1997 |
| | | | | University | | |
| | | | | Press | | |
| Reference3 | Book title | A Cognitive Appro | ach to language l | earning | ISBN | 0-19- |
| | | | | | | 437217-0 |
| | Author | Skehan, Peter | Publisher | Oxford | Publish year | 1998 |
| | | | | University | | |
| | | | | Press | | |

Notes for reference

Goals to be achieved

To introduce what has been done for second language acquisition research.

To introduce the lack of decisive method for language learning.

To examine the validity of the Input Hypothesis.

To introduce what has been done for second language acquisition research.

To introduce the lack of decisive method for language learning.

To examine the validity of the Input Hypothesis.

Evaluation of achievement

Assessment will be based on coursework (80%), and attendance (20%).

•4 pieces of written coursework (essay) with 300 words or over to be submitted by the relevant deadline.

 \geq 80 点:A、 \geq 65 点:B、 \geq 55 点:C (including all the goals shown above)

Assessment will be based on coursework (80%), and attendance (20%).

•4 pieces of written coursework (essay) with 300 words or over to be submitted by the relevant deadline.

 \geq 80 点:A、 \geq 65 点:B、 \geq 55 点:C (including all the goals shown above)

Examination

試験期間中には何も行わない

None during exam period **Details of examination**

Other information

Reference URL

Office hours

Drop-in basis

Drop-in basis

Relations to attainment objectives of learning and education (A)幅広い人間性と考え方

人間社会を地球的な視点から多面的にとらえ、自然と人間との共生、人類の幸福・健康・福祉について考える能力

(A)幅広い人間性と考え方 人間社会を地球的な視点から多面的にとらえ、自然と人間との共生、人類の幸福・健康・福祉について考える能力

Second Language (L2) Acquisition, Language Leaning, Language Teaching Second Language (L2) Acquisition, Language Leaning, Language Teaching

(M41610010)Seminar on Mechanical Engineering I[Seminar on Mechanical Engineering I]

| Subject name[English] | Seminar on Mech | anical Engineering I | Seminar on Mecha | nical Engineering I] | |
|-------------------------------------|--------------------------|----------------------|----------------------|----------------------|-------------------|
| Schedule number | M41610010 | Subject area | Advanced | Required or | Required |
| | | | Mechanical | elective | |
| | | | Engineering | | |
| Time of starting a course | Year | Dav of the | Intensive | Credit(s) | 4 |
| C | | week.period | | | |
| Faculty | Graduate Program | n for Master's Degre | e | Subject grade | 1~ |
| Department Offered | Mechanical Engin | eering | | Beggining | M1, M2 |
| - | _ | - | | grade | |
| Charge teacher name[Roman | S1系教務委員, 1 | I系各教員 1kei kyoi | mu Iin-S, 1kei kakul | kyouin | |
| alphabet mark] | | - | | - | |
| Numbering | | | | | |
| Objectives of class | | | | | |
| The environ sime to pupyide a bu | a a di un da vatan din a | of the mechanical o | | fourthe meaton the | aio waaaawah of a |
| The seminar and to provide a br | oau understanding | or the mechanical e | ngineering available | e for the master the | sis research of a |
| Contents of class | | | | | |
| The class provides both of funds | mental knowledge | of his /her master + | hasis research was | k and the most of | vanced results in |
| the related field by reading room | arch papers and r | on mis/ner master t | incolo research wor | r and the most ad | vanceu results In |
| announced by individual supervise | aron papers and n | nonographs. The CC | interits of the clas | | |
| Self Preparation and Paview | <i>л</i> ъ. | | | | |
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| Related subjects | | | | | |
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| Notes for textbook | | | | | |
| Textbook or material will be made | available from the | supervisors. | | | |
| Notes for reference | | | | | |
| | | | | | |
| Goals to be achieved | | | | | |
| To acquire fundamental knowledg | e of individual resea | arch fields. | | | |
| To acquire the ability to find prob | lems, the ability to | solve the problems, | and the presentati | on skill. | |
| | | | | | |
| Evaluation of achievement | | | | | |
| Coursework, presentation and/or | report. | | | | |
| Examination | | | | | |
| その他 | | | | | |
| None during exam period | | | | | |
| Details of examination | | | | | |
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| Other information | | | | | |
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| Reference URL | | | | | |
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| Office hours | | | | | |
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| Relations to attainment objective | s of learning and 6 | ucation | | | |
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| Key words | | | | | |
| Ney words | | | | | |
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(M41610020)Seminar on Mechanical Engineering II[Seminar on Mechanical Engineering II]

| Subject name[English] | Seminar on Mech | nanical Engineering II | [Seminar on Mecha | anical Engineering II |] |
|--|----------------------|------------------------|----------------------|-----------------------|--------------------|
| Schedule number | M41610020 | Subject area | Advanced | Required or | Required |
| | | | Mechanical | elective | - |
| | | | Engineering | | |
| Time of starting a course | Year | Day of the | Intensive | Credit(s) | 2 |
| | | week,period | | | |
| Faculty | Graduate Progra | m for Master's Degre | ee | Subject grade | 2~ |
| Department Offered | Mechanical Engir | neering | | Beggining grade | M2 |
| Charge teacher name[Roman alphabet mark] | S1系教務委員, | 1系各教員 1kei kyo | mu Iin−S, 1kei kaku | kyouin | |
| Numbering | | | | | |
| Objectives of class | | | | | |
| The seminar aims to provide a br student. | oad understanding | of the mechanical e | ngineering available | e for the master the | esis research of a |
| Contents of class | | | | | |
| The class provides both of funda | amental knowledge | of his/her master t | hesis research wo | rk and the most ac | lvanced results in |
| the related field by reading rese | earch papers and | monographs. The co | ontents of the clas | s depend on the | supervisor. To be |
| announced by individual supervise | ors. | | | | |
| Self Preparation and Review | | | | | |
| Related subjects | | | | | |
| Notes for textbook | | | | | |
| l extbook or material will be made | e available from the | e supervisors. | | | |
| Notes for reference | | | | | |
| Goals to be achieved | | | | | |
| To acquire fundamental knowledg | e of individual rese | earch fields. | | | |
| To acquire the ability to find prob | lems, the ability to | solve the problems, | and the presentat | ion skill. | |
| Evaluation of achievement | | | | | |
| Coursework, presentation and/or | report. | | | | |
| Examination | | | | | |
| その他 | | | | | |
| None during exam period | | | | | |
| Details of examination | | | | | |
| Other information | | | | | |
| Reference URL | | | | | |
| Office hours | | | | | |
| Relations to attainment objective | s of learning and e | education | | | |
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| Key words | | | | | |
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(M41610030)Thesis Research on Mechanical Engineering[Thesis Research on Mechanical Engineering]

| Schedule number | M41610030 | Subject area | Advanced | Required or | Required |
|------------------------------------|-----------------------|---------------------------|---------------------|----------------------|--------------------|
| | | | Mechanical | elective | - |
| | | | Engineering | | |
| Time of starting a course | 2Years | Day of the week.period | Intensive | Credit(s) | 6 |
| Faculty | Graduate Program | n for Master's Degre | e | Subject grade | 1~1 |
| Department Offered | Mechanical Engin | eering | | Beggining grade | M1, M2 |
| Charge teacher name[Roman | S1系教務委員, | 1系各教員 1kei kyoi | mu Iin−S, 1kei kakı | ukyouin | I |
| alphabet mark] | | | | | |
| Numbering | | | | | |
| Objectives of class | | | | | |
| The thesis research aims to p | rovide a practical | experience of rese | arch work. and t | o acquire research | skills with deep |
| understanding of the relevant know | owledge. | | | | |
| Contents of class | 5 | | | | |
| The research subject depends | on the supervisor | and the research | group you join. In | idividual students w | ill have different |
| research subjects. Discuss with | , your supervisor. | | | | |
| Self Preparation and Review | | | | | |
| | | | | | |
| Related subjects | | | | | |
| Notes for textbook | | | | | |
| Reference and material will be av | ailable from the sup | pervisor. | | | |
| Notes for reference | | | | | |
| Goals to be achieved | | | | | |
| To get something new on individu | ual research fields. | | | | |
| To develop your research skills i | ncluding planning an | d presentation skills | 3. | | |
| Evaluation of achievement | | | | | |
| Examination | | | | | |
| その他 | | | | | |
| None during exam period | | | | | |
| Details of examination | | | | | |
| Other information | | | | | |
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| Reference URL | | | | | |
| Office hours | | | | | |
| Relations to attainment objective | es of learning and e | ducation | | | |
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| Key words | | | | | |

(M41610030)Thesis Research on Mechanical Engineering[Thesis Research on Mechanical Engineering]

| Subject name[English] | Thesis Research | n on Mechanical Engir | eering[Thesis Res | earch on Mechanica | al Engineering] |
|------------------------------------|---------------------|------------------------|------------------------|---------------------|---------------------|
| Schedule number | M41610030 | Subject area | Advanced | Required or | Required |
| | 1111010000 | | Mechanical | elective | Required |
| | | | Engineering | 0100040 | |
| Time of starting a course | 2Vears | Day of the | Intensive | Credit(e) | 6 |
| Time of starting a course | 210013 | week period | Incensive | Of Builds/ | 0 |
| Faculty (| Graduata Brager | m for Mostor's Dorr | 2 | Subject grade | 1~ |
| Paculty Department Offered | Machanical Engi | an for Master's Degre | | Subject grade | M1 M2 |
| Department Onered | | licening | | Deggining | 1011, 1012 |
| Charge teacher name[Roman | S1系教務委員 | 1 系 各 教 旨 1 kei kvor | mu lin – S. 1 kei kaku | Ikvouin | |
| alphabet mark] | | | | | |
| Numbering | | | | | |
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| Objectives of class | | | | | |
| The thesis research aims to pr | ovide a practical | experience of resea | rch work, and to | acquire research s | kills with a deep |
| understanding of relevant knowle | dge. | | | | |
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| Contents of class | | | | | |
| The research subject depends | on the superviso | r and the research | group you join. In | dividual students w | vill have different |
| research subjects. Discuss with y | our supervisor. | | | | |
| Self Preparation and Review | | | | | |
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| Palatad subjects | | | | | |
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| Notes for textbook | | | | | |
| Reference and material will be av | ailable from the su | upervisor. | | | |
| Notes for reference | | | | | |
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| Goals to be achieved | | | | | |
| To get something new on individu | al research fields | | | | |
| To develop your research skills in | cluding planning a | nd presentation skills | | | |
| Evaluation of achievement | | | • | | |
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| Examination | | | | | |
| その他 | | | | | |
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| Key words | | | | | |
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(M4161003T)Thesis Research on Mechanical Engineering[Thesis Research on Mechanical Engineering]

| Subject name[English] | Thesis Research | on Mechanical Engi | neering[Thesis Res | earch on Mechanica | I Engineering] |
|------------------------------------|----------------------|-----------------------|---------------------------|----------------------|---------------------|
| Schedule number | M4161003T | Subject area | Advanced | Required or | Required |
| | | | Mechanical | elective | |
| | | | Engineering | Clobard | |
| Time of starting a course | Vear | Day of the | Intensive | Credit(e) | 6 |
| Time of starting a course | 1 Cal | week period | Incensive | Of Buil(s) | 0 |
| Faculty | Graduata Bragran | n for Mostor's Dorr | | Subject grade | 2~2 |
| Paculty Department Offered | Machanical Engin | n for Master's Degre | 56 | Subject grade | 2.°2 M2 |
| Department Offered | weenanical Engin | eering | | Deggining | IVIZ |
| Ohanna taaahan aana (Daman | 01 亚 | (玄々教号 1):) | | grade | |
| Charge teacher name_roman | 51 术权伤安良, | I 术台 叙頁 TKel Kyo | mu im=3, tket kaki | ukyouin | |
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| Numbering | | | | | |
| Objectives of class | | | | | |
| The thesis research aims to pr | ovide a practical e | experience of resea | rch work, and to | acquire research s | kills with a deep |
| understanding of relevant knowle | dge. | | | | - |
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| Contents of algos | | | | | |
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| The research subject depends | on the supervisor | and the research | group you join. Ir | iuividual students w | nave different |
| research subjects. Discuss with y | our supervisor. | | | | |
| Self Preparation and Review | | | | | |
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| Related subjects | | | | | |
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| Notes for textbook | | | | | |
| Reference and material will be av | ailabla from the our | ordioor | | | |
| Neter for reference | allable from the sup | Jervisor. | | | |
| Notes for reference | | | | | |
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| Goals to be achieved | | | | | |
| To get something new on individu | al research fields. | | | | |
| To develop your research skills in | ncluding planning an | d presentation skills | ŝ. | | |
| Evaluation of achievement | | | | | |
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| その他 | | | | | |
| Other | | | | | |
| Details of examination | | | | | |
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| Other information | | | | | |
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| Reference LIRI | | | | | |
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| Relations to attainment objective | s of learning and e | ducation | | | |
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| Key werde | | | | | |
| Ney Words | | | | | |
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(M41610040)Seminar on Mechanical Engineering[Seminar on Mechanical Engineering]

| Subject name[English] | Seminar on Mech | anical Engineering[S | Seminar on Mechan | ical Engineering] | |
|-------------------------------------|----------------------|----------------------|----------------------|---------------------|--------------------|
| Schedule number | M41610040 | Subject area | Advanced | Required or | Required |
| | | | Mechanical | elective | |
| | | | Engineering | | |
| Time of starting a course | Year | Day of the | Intensive | Credit(s) | 6 |
| | | week,period | | | |
| Faculty | Graduate Program | n for Master's Degre | e | Subject grade | 2~ |
| Department Offered | Mechanical Engin | eering | | Beggining | M2 |
| | | | | grade | |
| Charge teacher name[Roman | S1系教務委員, | 1系各教員 1kei kyo | mu Iin−S, 1kei kaku | kyouin | |
| alphabet mark] | | | | | |
| Numbering | | | | | |
| Objectives of class | | | | | |
| The seminar aims to provide a br | oad understanding | of the mechanical e | ngineering available | e for the master th | esis research of a |
| student. | | | | | |
| Contents of class | | | | | |
| The class provides both of funda | amental knowledge | of his/her master t | hesis research wo | rk and the most ac | vanced results in |
| the related field by reading rese | arch papers and r | monographs. The co | ontents of the clas | s depend on the | supervisor. To be |
| announced by individual supervise | ors. | | | | |
| Self Preparation and Review | | | | | |
| | | | | | |
| Related subjects | | | | | |
| | | | | | |
| Notes for textbook | | | | | |
| Textbook or material will be made | available from the | supervisors | | | |
| Notes for reference | | | | | |
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| Goals to be achieved | | | | | |
| To acquire fundamental knowledge | e of individual rese | arch fields | | | |
| To acquire the ability to find prob | lems, the ability to | solve the problems | and the presentati | ion skill | |
| Evaluation of achievement | | | | | |
| Coursework, presentation and/or | report. | | | | |
| Examination | | | | | |
| その他 | | | | | |
| None during exam period | | | | | |
| Details of examination | | | | | |
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| Other information | | | | | |
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| Reference LIRI | | | | | |
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| Kaumanda | | | | | |
| rey words | | | | | |
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(M41610050)Internship[Internship]

| Subject name[English] | Internship[Interns | hip] | | | |
|-------------------------------------|-----------------------|----------------------|----------------------|--------------------|-------------------|
| Schedule number | M41610050 | Subject area | Advanced | Required or | Required |
| | | | Mechanical | elective | i toquii ou |
| | | | Engineering | 000040 | |
| Time of starting a course | Fall term | Day of the | Intensive | Credit(s) | 0 |
| | | week,period | Intensive | Or Builds/ | 0 |
| Faculty | Graduate Program | n for Master's Degre | e | Subject grade | 2~ |
| Department Offered | Mechanical Engine | eering | | Beggining | M2 |
| | | | | grade | |
| Charge teacher name[Roman | S1系教務委員 1 | kei kyomu Iin−S | | | |
| alphabet mark] | | | | | |
| Numbering | | | | | |
| Objectives of class | | | | | |
| The seminar aims to provide a br | oad understanding | of the mechanical e | ngineering available | for the master the | sis research of a |
| student. | | | | | |
| The seminar aims to provide a br | oad understanding | of the mechanical e | ngineering available | for the master the | sis research of a |
| student. | | | | | |
| Contents of class | | | | | |
| The class provides both of funda | amental knowledge | of his/her master t | hesis research worl | k and the most adv | vanced results in |
| the related field by reading rese | arch papers and n | nonographs. The co | ntents of the class | depend on the s | upervisor. To be |
| announced by individual supervise | ors. | | | | |
| The class provides both of funda | amental knowledge | of his/her master t | hesis research worl | k and the most adv | vanced results in |
| the related field by reading rese | arch papers and n | nonographs. The co | ntents of the class | depend on the s | upervisor. To be |
| announced by individual superviso | ors. | | | | |
| Self Preparation and Review | | | | | |
| | | | | | |
| Related subjects | | | | | |
| Notes for textbook | | | | | |
| Textbook or material will be made | available from the | supervisors. | | | |
| Textbook or material will be made | available from the | supervisors. | | | |
| Notes for reference | | | | | |
| | | | | | |
| Goals to be achieved | | | | | |
| To acquire fundamental knowledg | e of individual resea | arch fields. | | | |
| To acquire the ability to find prob | lems, the ability to | solve the problems, | and the presentation | on skill. | |
| To acquire fundamental knowledg | e of individual resea | arch fields. | | | |
| To acquire the ability to find prob | lems, the ability to | solve the problems, | and the presentation | on skill. | |
| Evaluation of achievement | | | | | |
| Coursework, presentation and/or | report. | | | | |
| Coursework, presentation and/or | report. | | | | |
| | | | | | |
| 試験期間中には何も行わない | | | | | |
| None during exam period | | | | | |
| Details of examination | | | | | |
| Other information | | | | | |
| Reference URL | | | | | |
| Office hours | | | | | |
| Relations to attainment objective | s of learning and e | ducation | | | |
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(M41630040)Micromachining Engineering[Micromachining Engineering]

| Subject name[English] | Micromachini | ng Engineering[Micro | machining Engine | ering] | | |
|--|-----------------------|--|--------------------|---------------------------------|------------------|-----------------|
| Schedule number | M41630040 | | Subject area | Advanced | Required or | Elective |
| | | | | Mechanical | elective | |
| | | | | Engineering | | |
| Time of starting a | Fall2 term | | Day of the | Tue.1~1 | Credit(s) | 1 |
| course | | | week,period | | | |
| Faculty | Graduate Pro | gram for Master's De | gree | 1 | Subject | 1~ |
| | | | | | grade | |
| Department Offered | Mechanical E | ngineering | | | Beggining | M1, M2 |
| | | | | | grade | |
| Charge teacher | 柴田 隆行 S | HIBATA Takayuki | | | | |
| name[Roman alphabet | | | | | | |
| mark] | | | | | | |
| Numbering | | | | | | |
| Objectives of class | I | | | | | |
| The objectives of this c | ourse is to intr | oduce fundamentals (| of micromachining | a technologies (micro | ofabrication tec | hnologies) and |
| their application in the d | levelonment ″N | licro Electro Mechani | cal System (MFM | (Interview) (S) and "Micro Tota | al Analysis Syst | $em(\mu TAS)''$ |
| The objectives of this o | ourse is to intr | oduce fundamentals (| of micromachining | a technologies (micro | ofabrication tec | $(\mu n k 0)$. |
| their application in the d | levelopment "M | licro Electro Mechani | cal System (MFM | (S)" and "Micro Tota | al Analysis Svet | em (// TAS)" |
| Contents of class | | | | | | ε (μ 1710) . |
| 1. Introduction of MEMS | and UTAS | | | | | |
| 2 Photolithography | | | | | | |
| 3 Wet etching and Drug | etching | | | | | |
| 4 Physical vanor denosi | tion (PVD) and | Chemical vanor deno | sition (CVD) | | | |
| 5 Plating and Electrofor | ming | | | | | |
| 6 Bonding processes | IIIIIg | | | | | |
| 7 Surface micromachini | ng and Bulk mi | romachining | | | | |
| 8. Precentation and disc | uccion | STOTTACTITITIN | | | | |
| 1 Introduction of MEMS | and UTAS | | | | | |
| 2 Photolithography | and μ TAS | | | | | |
| 2. Photonichography 3. Wet etching and Drug | tohing | | | | | |
| A Devoiced vener denosi | tion (DVD) and | Chamical vapor dana | white (C) | | | |
| 5 Plating and Electrofor | ming | Chemical vapor depo | | | | |
| 6. Plauring and Electroior | ming | | | | | |
| 7 Surface micromachini | ng and Bulk mi | romachining | | | | |
| 8 Precentation and disc | ing and Duik mit | cromachining | | | | |
| Self Preparation and Ba | | | | | | |
| Sell Preparation and Re | | aview each leases | | | | |
| Students are required to | EMS to choole of | eview each lesson. | uana tha fallowing | | | |
| Studente ere required to | | | rom the following | website, http://www | v.memsnet.org/1 | nems/ |
| Useful information on M | EMS technolog | eview each lesson. iec can be obtained fi | rom the following | website: http://www | memoret org/r | mams / |
| Related subjects | | ies can be obtained li | | website, http://www | v.memsnet.org/1 | 1101118/ |
| A fundamental knowlede | e of physics an | d chemistry is require | ed | | | |
| A fundamental knowledg | e of physics an | d chemistry is requir | ed. | | | |
| Notes for textback | e or priysics an | in onemistry is requir | eu. | | | |
| No toythook is required | for this alass | | | | | |
| Hooful information on M | TOT UNIS CLASS. | ion oon ha shtaine d f | rom the fallowing | wahaita http://www | momorat and | mama / |
| No textbook is required | for this aloos | ies can be obtained ti | ioni the following | website, http://WWV | v.memsnet.org/ r | 1101115/ |
| Leaful information on M | FMS technolog | iec can be obtained f | rom the following | website: http://www | memorat are /- | noms/ |
| Deference1 | Book Aire | | Microfobrication | (2nd ad). The | iensiet.org/ f | |
| Reference i | BOOK TITIE | Solonoo of Minister | witcroradrication | (zna ea.): The | ISDN | |
| | Author | | Dublichan | | Dublich war | 2002 |
| Deferrence® | Autrior Bask title | | rudiisner | URU Press | | 2002 |
| Reterencez | BOOK LILIE | introduction to Mic | rolaprication | ſ | 1980 | |
| | Author | S. Franssila | Publisher | John Wiley & | Publish year | 2004 |
| | | | | Sons | <u> </u> | |
| Reference3 | Book title | The MEMS Handbo | ok (2nd ed.) | | ISBN | |
| | Author | M. Gad-El-Hak | Publisher | CRC Pr I Llc | Publish year | 2006 |
| Notes for reference | | | | | | |
| | | | | | | |

| Goals to be achieved |
|---|
| - To gain an understanding of the fundamentals of micromachining technologies for MEMS and UTAS |
| - To apply knowledge of micromachining technologies to the design and manufacturing of microdevices |
| |
| – To gain an understanding of the fundamentals of micromachining technologies for MEMS and μ TAS |
| - To apply knowledge of micromachining technologies to the design and manufacturing of microdevices |
| Evaluation of achievement |
| Presentation (70%) and classroom performance (30%). An oral presentation on micromachining technologies for the fabrication |
| of MEMS and μ TAS devices will be imposed during the course of class. |
| Presentation (70%) and classroom performance (30%). An oral presentation on micromachining technologies for the fabricat |
| of MEMS and μ TAS devices will be imposed during the course of class. |
| Examination |
| その他 |
| Other |
| Details of examination |
| An oral presentation on micromachining technologies will be imposed during the course of class. |
| An oral presentation on micromachining technologies will be imposed during the course of class. |
| Other information |
| Takayuki Shibata: room D-605, E-mail: shibata@me.tut.ac.jp |
| Takayuki Shibata: room D-605, E-mail: shibata@me.tut.ac.jp |
| Reference URL |
| http://mems.me.tut.ac.jp/ |
| http://mems.me.tut.ac.jp/ |
| Office hours |
| Anytime during regular working hours. Contact me by email before coming if possible. |
| Anytime during regular working hours. Contact me by email before coming if possible. |
| Relations to attainment objectives of learning and education |
| |
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| |
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Micromachining, Microfabrication, Photolithography, Wet etching, Dry etching, Physical vapor deposition (PVD), Chemical vapor deposition (CVD), Plating, Bonding processes, MEMS, μ TAS

Micromachining, Microfabrication, Photolithography, Wet etching, Dry etching, Physical vapor deposition (PVD), Chemical vapor deposition (CVD), Plating, Bonding processes, MEMS, μ TAS

| | | | elet Transform[Tim | le−frequency Ana | lysis and Wavelet | Transfo |
|--|--|---|--|--|--|---------|
| Schedule number | M41630120 | | Subject area | Advanced Mechanical Engineering | Required or elective | Elect |
| Time of starting a course | Fall2 term | | Day of the week.period | Tue.2~2 | Credit(s) | 1 |
| Faculty | Graduate Pro | ogram for Master's De | gree | I | Subject | 1~ |
| Department Offered | Mechanical E | Engineering | | | Beggining | M1, N |
| Charge teacher name[Roman | 章 忠 SHO | Tadashi | | | graue | |
| Alphabet marks Numbering | - | | | | | |
| Objectives of place | | | | | | |
| Application of the way Time series signal ar Image processing Abnormal detection Surface inspection Basic theory of time Shot-Time Fourier tr | velet Transform halysis -frequency ana ansform | n will be briefly discus: alysis method will be b | sed. riefly discussed. | | | |
| 2) The Wigner-Ville Dist 3) Hilbert Transform and 4) Wavelet transform 2. Application of the wav 1) Time series signal ar 2) Image processing 3) Abnormal detection 4) Surface inspection Self Preparation and R | ribution d instantaneous velet Transform nalysis eview | s frequency analysis n will be briefly discus | sed. | | | |
| 2) The Wigner-Ville Dist 3) Hilbert Transform and 4) Wavelet transform 2. Application of the war 1) Time series signal ar 2) Image processing 3) Abnormal detection 4) Surface inspection Self Preparation and R Related subjects Basic knowledge of the Basic knowledge of the Notes for textbook Materials will be perparation | d instantaneous velet Transform alysis eview signal analysis signal analysis ed by lecturer. ed by lecturer. | s frequency analysis n will be briefly discus | sed. | | | |
| 2) The Wigner-Ville Dist 3) Hilbert Transform and 4) Wavelet transform 2. Application of the war 1) Time series signal ar 2) Image processing 3) Abnormal detection 4) Surface inspection Self Preparation and R Related subjects Basic knowledge of the Basic knowledge of the Basic knowledge of the Notes for textbook Materials will be perpar Materials will be perpar Reference1 | eview elet Transform alysis eview signal analysis signal analysis ed by lecturer. ed by lecturer. Book title | s frequency analysis n will be briefly discus | sed. | for Manufacturin; | g ISBN | |
| 2) The Wigner-Ville Dist 3) Hilbert Transform and 4) Wavelet transform 2. Application of the war 1) Time series signal ar 2) Image processing 3) Abnormal detection 4) Surface inspection Self Preparation and R Related subjects Basic knowledge of the Basic knowledge of the Notes for textbook Materials will be perpar Materials will be perpar Reference 1 | eview signal analysis signal analysis ed by lecturer. ed by lecturer. Book title Author | s frequency analysis n will be briefly discus , , ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; | sed. ting technologies | for Manufacturin, | g ISBN | 2007 |
| 2) The Wigner-Ville Dist 3) Hilbert Transform and 4) Wavelet Transform and 4) Wavelet transform 2. Application of the war 1) Time series signal ar 2) Image processing 3) Abnormal detection 4) Surface inspection Self Preparation and R Related subjects Basic knowledge of the Basic knowledge of the Basic knowledge of the Notes for textbook Materials will be perpar Materials will be perpar Reference1 Reference2 | eview signal analysis signal analysis ed by lecturer. Book title Book title | s frequency analysis n will be briefly discus Frontiers in compu applications Y. Shimizu , Z. Zhang, R. Batres Wavelets and analys | sed. ting technologies Publisher sis | for Manufacturin; Springer | g ISBN Publish year ISBN | 2007 |
| 2) The Wigner-Ville Dist 3) Hilbert Transform and 4) Wavelet Transform and 4) Wavelet transform 2. Application of the war 1) Time series signal ar 2) Image processing 3) Abnormal detection 4) Surface inspection Self Preparation and R Related subjects Basic knowledge of the Basic knowledge of the Basic knowledge of the Notes for textbook Materials will be perpar Materials will be perpar Reference1 Reference2 | eview esignal analysis ed by lecturer. Book title Author Author | s frequency analysis n will be briefly discus Frontiers in compu applications Y. Shimizu , Z. Zhang, R. Batres Wavelets and analys M. Holschneider | sed. ting technologies Publisher sis Publisher | for Manufacturin Springer Oxford University | g ISBN Publish year ISBN Publish year | 2007 |

| | Author | R.L. | Allen, | D.W. | Publisher | IEEE Press | Publish year | |
|--|------------------|----------|------------|----------|-----------------|-----------------------|--------------|--|
| | | Mills | | | | | | |
| Notes for reference | | | | | | | | |
| | | | | | | | | |
| Goals to be achieved | | | | | | | | |
| Understanding the know | vledge of the ti | me-frea | quency a | analysis | method and usin | g them in real applic | ation | |
| Understanding the knowledge of the time-frequency analysis method and using them in real application | | | | | | | | |
| Evaluation of achievem | ent | | | | | | | |
| Interim report (50%) and | term-end rep | ort (50% | b) | | | | | |
| Interim report (50%) and | d term-end rep | ort (50% | 6) | | | | | |
| Examination | | | | | | | | |
| レポートで実施 | | | | | | | | |
| By Report | | | | | | | | |
| Details of examination | | | | | | | | |
| | | | | | | | | |
| Other information | | | | | | | | |
| Room: D-610, E-mail: z | hang@me.tut.ac | .jp | | | | | | |
| Room: D-610, E-mail: z | hang@me.tut.ac | ;jp | | | | | | |
| Reference URL | | | | | | | | |
| http://is.me.tut.ac.jp | | | | | | | | |
| http://is.me.tut.ac.jp | | | | | | | | |
| Office hours | | | | | | | | |
| | | | | | | | | |
| Relations to attainment | t objectives of | learning | g and ed | ucation | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| Key words | | | | | | | | |
| Wavelet transform, Time | e-frequency an | alysis | | | | | | |
| Wavelet transform, Time | e-frequency an | alysis | | | | | | |

| (M41630170)Advanced Applied Fluid Engineering Advanced Applied Fluid Engi | neering] |
|---|----------|
|---|----------|

| Subject name[English] | Advanced Ap | plied Fluid Engineerin | ng[Advai | nced / | Appli | ed Fluid Engineerir | ng] | | |
|-----------------------------|---|-------------------------|-----------|---------|-------|---------------------|------------------|-----------------|--|
| Schedule number | M41630170 | | Subje | oct are | a | Advanced | Required or | Elective | |
| | | | | | | Mechanical | elective | | |
| | | | | | | Engineering | | | |
| Time of starting a | Fall1 term | | Day | of t | the | Mon.1~1 | Credit(s) | 1 | |
| course | | | week, | ,perioc | ł | | | | |
| Faculty | Graduate Pro | gram for Master's De | egree | | | | Subject | 1~ | |
| | | | | | | | grade | | |
| Department Offered | Mechanical E | ngineering | | | | | Beggining | M1, M2 | |
| | | | | | | | grade | | |
| Charge teacher | 柳田 秀記 Y | 柳田 秀記 YANADA Hideki | | | | | | | |
| name[Roman alphabet | | | | | | | | | |
| mark] | | | | | | | | | |
| Numbering | | | | | | | | | |
| Objectives of class | | | | | | | | | |
| The class treats the dv | namics of fluid | in a nine which is a t | typical (| distrih | uted | narameter system | The primary ob | iectives of the | |
| class are to understand | transient nhe | nomena in a nine th | he theo | ries t | hat | describe the dyna | mic behaviors of | fluid and the | |
| methods to analyze ther | m | | | 1103 1 | nac | | | | |
| The class treats the due | namics of fluid | in a nine which is a t | typical | distrih | uted | narameter system | The primary of | iectives of the | |
| class are to understand | transient nhe | nomena in a nine +l | he theo | ries + | hat | describe the duna | mic behaviors of | fluid and the | |
| methods to analyze the | n | | | t | | | | | |
| Contents of class | | | | | | | | | |
| 1st week: One-dimensio | nal wave equat | ion and its solution in | a time d | omain | for | localess lines | | | |
| 2nd week: Water hamme | r phenomenon | ion and its solution if | i time u | omain | TOr | IOSSIESS IITIES | | | |
| 2rd week. Water namine | | Lanlago domain | | | | | | | |
| Ath week: Steady friction | ave equation in | ctoody friction model | Dropo | ration | | atant | | | |
| 5th week: Steady Incline | n model and unsteady friction model, Propagation constant | | | | | | | | |
| 6th week. Oscillatory lai | / laminar flow in pipe | | | | | | | | |
| 7th week: Hydraulic imp | edance, renect | on coefficient, and in | equency | y resp | onse | e analysis | | | |
| 7th week: Characteristic | s method | | | | | | | | |
| our week. Examination | | | | | | | | | |
| | | | | | | | | | |
| 1st week: One-dimensio | nal wave equat | ion and its solution ir | n time d | omain | for | lossless lines | | | |
| 2nd week: Water hamme | r phenomenon | | | | | | | | |
| 3rd week: Solution of wa | ave equation in | Laplace domain | | | | | | | |
| 4th week: Steady friction | n model and un | steady friction model | l, Propa | gation | con | stant | | | |
| 5th week: Oscillatory lar | ninar flow in pi | be | | | | | | | |
| 6th week: Hydraulic imp | edance, reflect | on coefficient, and fr | equency | y resp | onse | e analysis | | | |
| 7th week: Characteristic | s method | | | | | | | | |
| 8th week: Examination | | | | | | | | | |
| | | | | | | | | | |
| Self Preparation and Re | view | | | | | | | | |
| | | | | | | | | | |
| Related subjects | | | | | | | | | |
| Fluid mechanics. Mecha | nics. Laplace tr | ansform | | | | | | | |
| Fluid mechanics, Mecha | nics, Laplace tr | ansform | | | | | | | |
| Notes for textbook | | | | | | | | | |
| Printed materials are given | /en. | | | | | | | | |
| Printed materials are given | /en. | | | | | | | | |
| Reference1 | Book title | Fluid Transients in | System | ıs | | | ISBN | | |
| | Author | Wulie Streeter | Dukl | ahor | | MaGrow-Hill | Dublich vees | | |
| | Autior | Lisheng | Fublis | | | | | | |
| Notoo for reference | 1 | LISHCHE | I | | | 1 | 1 | l | |
| INOTES TOP RETERENCE | | | | | | | | | |
| | | | | | | | | | |
| Goals to be achieved | | | | | | | | | |
| To understand the trans | ient phenomen | a that occur in a pipe | e. | | | | | | |
| To understand the fundation | amental theorie | s that describe the d | ynamic | behav | viors | of fluid in a pipe. | | | |
| | | | | | | | | | |

To understand the transient phenomena that occur in a pipe. To understand the fundamental theories that describe the dynamic behaviors of fluid in a pipe.

Evaluation of achievement

Written reports:50%, Examination:50% Written reports:50%, Examination:50%

Examination 定期試験を実施(対面) Examination(Face to Face)

Details of examination

Other information

Room: D309, E-mail: yanada@me.tut.ac.jp Room: D309, E-mail: yanada@me.tut.ac.jp

Reference URL

Office hours

Basically, every time is OK. The time for discussion can be determined through e-mails when the lecturer is abscent from his office.

Basically, every time is OK. The time for discussion can be determined through e-mails when the lecturer is abscent from his office.

Relations to attainment objectives of learning and education

(M41630190)Applied Combustion Engineering[Applied Combustion Engineering]

| Subject name[English] | Applied Combustion Engine | eering[Applied Combustio | n Engineering] | | | | | | |
|--|---|---------------------------------------|--------------------|---------------------|-----------------|--|--|--|--|
| Schedule number | M41630190 | Subject area | Advanced | Required or | Elective | | | | |
| | | | Mechanical | elective | | | | | |
| | | | Engineering | | | | | | |
| Time of starting a | Fall1 term | Day of the | Mon.2~2 | Credit(s) | 1 | | | | |
| course | | week,period | | | | | | | |
| Faculty | Graduate Program for Mas | ter's Degree | | Subject | 1~ | | | | |
| | | | | grade | | | | | |
| Department Offered | Mechanical Engineering Beggining M1, M2 | | | | | | | | |
| Charge teacher | 野田 進 NODA Susumu | | | 8 | | | | | |
| name[Roman alphabet | | | | | | | | | |
| mark] | | | | | | | | | |
| Numbering | | | | | | | | | |
| Objectives of class | | | | | | | | | |
| The global any iranment | ia a aubicat wa muat canaide | or in our opringering gati | vition Some nellur | tions come from a | ambustion and | | | | |
| dianayaa inta tha atmaar | is a subject we must conside | er in our engineering activ | vicies. Some poliu | | | | | | |
| of such flows will be lest | briere. Such prierioriteria take | place in turbulent reactions and sub- | ng nows. In the c | lass, the mathema | | | | | |
| of such flows will be lect | tured. In paticular, we focus of | on modeling of turbulent | | i on stochastic me | ethods. | | | | |
| dianawaa inta tha atmaan | is a subject we must conside | er in our engineering activ | vicies. Some poliu | | | | | | |
| disperse into the atmosp | onere. Such phenomena take | place in turbulent reactions and sub- | ng flows. In the c | lass, the mathema | tical treatment | | | | |
| of such flows will be lect | tured. In paticular, we focus of | on modeling of turbulent | compustion based | on stochastic me | ethods. | | | | |
| | | | | | | | | | |
| | | | | | | | | | |
| 2.Premixed compustion | | | | | | | | | |
| 3.Nonpremixed combusti | n | | | | | | | | |
| 4. I urbulent compustion | | | | | | | | | |
| 5. Statistical description | of turbulent combustion | | | | | | | | |
| b.Flamelet model | | | | | | | | | |
| 7.Probability density fund | ction(pdf) model | | | | | | | | |
| 8.Examination | | | | | | | | | |
| This class ought to open | n in alternate years, thus see | the teaching schedule. | | | | | | | |
| 1.Introduction | | | | | | | | | |
| 2.Premixed combustion | | | | | | | | | |
| 3.Nonpremixed combusti | on | | | | | | | | |
| 4. Turbulent combustion | | | | | | | | | |
| 5.Statistical description | of turbulent combustion | | | | | | | | |
| 6.Flamelet model | | | | | | | | | |
| 7.Probability density fund | ction(pdf) model | | | | | | | | |
| 8.Examination | | | | | | | | | |
| This class ought to open Self Preparation and Re | n in alternate years, thus see view | the teaching schedule. | | | | | | | |
| | | | | | | | | | |
| Related subjects | | | | | | | | | |
| Fundamental knowledge | ot the fluid dynamics is re | quired, but the statistics | s and the stocha | stics will be lectu | red with basic | | | | |
| contents. | C (1) (1) (1) (1) (1) (1) (1) (1 | | | | | | | | |
| Fundamental knowledge | of the fluid dynamics is re | quired, but the statistics | s and the stocha | stics will be lectu | red with basic | | | | |
| contents. | | | | | | | | | |
| | | | | | | | | | |
| Prints will be distributed | | | | | | | | | |
| | | | | | | | | | |
| | | | | | | | | | |
| | | | | | | | | | |
| Prints will be distributed | | | | | | | | | |
| | - | | | | | | | | |

| Reference1 | Book title | Principles of C | ombustion | | | ISBN | 0-471- |
|--------------------------|-------------------|--------------------|--------------------|-------------|---------|--------------|---------|
| | | | | | | | 04689-2 |
| | Author | Kuo,K.K. | Publisher | John | Wiley & | Publish year | 2005 |
| | | | | Sons | | | |
| Notes for reference | | | | | | | |
| Goals to be achieved | | | | | | | |
| Governing equations of | turbulent comb | oustion are deriva | ble from fundament | al equatior | ns. | | |
| Governing equations of | turbulent comb | oustion are deriva | ble from fundament | al equatior | ıs. | | |
| Evaluation of achievem | ent | | | | | | |
| Evaluation is based on a | an examination | and reports. | | | | | |
| Evaluation is based on a | an examination | and reports. | | | | | |
| Examination | | | | | | | |
| レポートで実施 | | | | | | | |
| By Report | | | | | | | |
| Details of examination | | | | | | | |
| | | | | | | | |
| Other information | | | | | | | |
| Room: D411, Tel.(Ext.): | 6681, e-mail: n | oda@me.tut.ac.jp | | | | | |
| Room: D411, Tel.(Ext.): | 6681, e-mail: n | oda@me.tut.ac.jp | | | | | |
| Reference URL | | | | | | | |
| http://www.mech.tut.ac | .jp/~noda/ | | | | | | |
| http://www.mech.tut.ac | ;jp/~noda/ | | | | | | |
| Office hours | | | | | | | |
| Any time in afternoon | | | | | | | |
| Any time in afternoon | | | | | | | |
| Relations to attainment | t objectives of l | earning and educ | ation | | | | |
| | | | | | | | |
| | | | | | | | |
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| | | | | | | | |
| | | | | | | | |
| Key words | | | | | | | |
| | | | | | | | |

(M41630210)Advanced Mechanical Systems Design I[Advanced Mechanical Systems Design I]

| Subject name[English] | Advanced Mecha | nical Systems | Desig | n I[Advanced Mech | anical Systems De | sign I] | | | | |
|-------------------------------------|---------------------|--------------------------|----------|----------------------|---------------------|--------------------|--|--|--|--|
| Schedule number | M41630210 | Subject are | a | Advanced | Required or | Elective | | | | |
| | | | | Mechanical | elective | | | | | |
| | | | | Engineering | | | | | | |
| Time of starting a course | Fall term | Day of | the | Mon.4~4 | Credit(s) | 2 | | | | |
| | | week,perio | d | | | | | | | |
| Faculty | Graduate Progra | m for Master's | s Degre | e | Subject grade | 1~ | | | | |
| Department Offered | Mechanical Engir | neering | | | Beggining | M1, M2 | | | | |
| | | grade | | | | | | | | |
| Charge teacher name[Roman | S1系教務委員1 | i1糸教務委員 1kei kyomu Iin−S | | | | | | | | |
| alphabet mark] | | | | | | | | | | |
| Numbering | | | | | | | | | | |
| Objectives of class | | | | | | | | | | |
| Experience research, design and | l development in | industries, an | d unde | erstand problem fo | rmulation and sol | ving strategies in | | | | |
| practical applications. Cultivate a | rich humanity for | being an eng | ineer v | vho can take the le | adership of a proj | ect through close | | | | |
| communication with an internship | supervisor. | | | | | | | | | |
| Experience research, design and | l development in | industries, an | d unde | erstand problem fo | rmulation and sol | ving strategies in | | | | |
| practical applications. Cultivate a | rich humanity for | being an eng | ineer v | vho can take the le | adership of a proj | ect through close | | | | |
| communication with an internship | supervisor. | | | | | | | | | |
| Contents of class | | | | | | | | | | |
| Participate in research, design a | nd development p | rojects in ind | ustries | that are suitable | for master's progr | am studies under | | | | |
| supervision by industrial engineer | s or managers. | | | | | | | | | |
| Participate in research, design a | nd development p | rojects in ind | ustries | that are suitable | for master's progr | am studies under | | | | |
| supervision by industrial engineer | s or managers. | | | | | | | | | |
| Self Preparation and Review | | | | | | | | | | |
| Prepare well for internship projec | ts by contacting in | idustrial super | visors. | | | | | | | |
| Prepare well for internship projec | ts by contacting in | idustrial super | visors. | | | | | | | |
| Related subjects | | | | | | | | | | |
| Depend on participating internship | o projects. | | | | | | | | | |
| Depend on participating internship | o projects. | | | | | | | | | |
| Notes for textbook | inductuies | | | | | | | | | |
| May be prepared by participating | industries. | | | | | | | | | |
| Nates for reference | industries. | | | | | | | | | |
| | | | | | | | | | | |
| Or de te he estimat | | | | | | | | | | |
| | | | | | | | | | | |
| Acquire communication skills for | or completing pro | jects and ap | pilcatic | on skills of materi | ais studied in ot | ner courses, and | | | | |
| Acquire communication skills for | r completing pro | iects and an | nligatio | n skills of materi | als studied in at | her courses and | | | | |
| understand their importance | a completing pro | jeets anu ap | piloaut | an anina or materi | ais studied in Ol | nei courses, arlu | | | | |
| Evaluation of achievement | | | | | | | | | | |
| Determined based on internship | project evaluation | sheets intern | ishin n | roject reports surv | ev reports of inte | nship project and | | | | |
| internship project presentation | | | | - <u>-</u> | -, | | | | | |
| A: 80 or over (out of 100) | | | | | | | | | | |
| B: 65–79 | | | | | | | | | | |
| C: 55–64 | | | | | | | | | | |
| | | | | | | | | | | |
| Determined based on internship | project evaluation | sheets, intern | ıship pı | roject reports, surv | ey reports of inter | nship project and | | | | |
| internship project presentation. | | , | | | | | | | | |
| A: 80 or over (out of 100) | | | | | | | | | | |
| B: 65-79 | | | | | | | | | | |
| C: 55–64 | | | | | | | | | | |
| | | | | | | | | | | |
| Examination | | | | | | | | | | |
| その他 | | | | | | | | | | |
| Other | | | | | | | | | | |
| Details of examination | | | | | | | | | | |
| Submission of internship project i | reports and presen | tation are req | uired. | | | | | | | |
| | • | | | | | | | | | |

| Other information | 1 | | | |
|--------------------|-------------------------|-----------------------|-------|--|
| Contact Uchiyam | a by e-mail for inquiry | | | |
| Contact Uchiyam | a by e-mail for inquiry | | | |
| Reference URL | | | | |
| Office hours | | | | |
| Contact Uchiyam | a by e-mail first. | | | |
| Contact Uchiyam | a by e-mail first. | | | |
| Relations to attai | nment objectives of le | earning and education | ation | |
| | - | - | | |
| | | | | |
| | | | | |
| | | | | |

(M41630230)Advanced Materials and Manufacturing Process I[Advanced Materials and Manufacturing Process I]

| Subject name[English] | Advanced Mate | rials and Manufactu | ring Process I[Ad | vanced Materials ar | nd Manufacturing | | | |
|---|--|--|--|--|--|--|--|--|
| | Process I] | | | | | | | |
| Schedule number | M41630230 | Subject area | Advanced Mechanical Engineering | Required or elective | Elective | | | |
| Time of starting a course | Fall term | Day of the | Tue.4~4 | Credit(s) | 2 | | | |
| Faculty | Graduate Progra | am for Master's Degr | ee | Subject grade | 1~ | | | |
| Department Offered | Mechanical Eng | Vechanical Engineering M1, M2 | | | | | | |
| Charge teacher name[Roman alphabet mark] | S1系教務委員 | 1kei kyomu Iin−S | | | | | | |
| Numbering | | | | | | | | |
| Objectives of class This lecture aims to provide a bra- research work of a student. This lecture aims to provide a bra- research work of a student. Contents of class | oad understandin; oad understandin; | g of the materials and g of the materials and | d manufacturing pi d manufacturing pi | rocess available for t rocess available for t | he master thesis he master thesis | | | |
| The class provides both of funda the related field by reading rese announced by individual supervise The class provides both of funda the related field by reading rese announced by individual supervise Self Preparation and Review | imental knowledge arch papers and ors. Imental knowledge arch papers and ors. | e of his/her master t monographs. The co e of his/her master t monographs. The co | hesis research wo ontents of the cla hesis research wo ontents of the cla | ork and the most add ss depend on the s ork and the most add ss depend on the s | vanced results in upervisor. To be vanced results in upervisor. To be | | | |
| Related subjects | | | | | | | | |
| Notes for textbook Textbook or material will be made Textbook or material will be made Notes for reference | available from th available from th | e supervisors. e supervisors. | | | | | | |
| Goals to be achieved To acquire fundamental knowledg | e of individual res | earch fields. | | | | | | |
| To acquire the ability to find prob | lems, the ability t | o solve the problems | and the presentat | ion skill. | | | | |
| To acquire fundamental knowledg To acquire the ability to find prob | e of individual res lems, the ability t | earch fields. o solve the problems | and the presentat | ion skill. | | | | |
| Evaluation of achievement Coursework, presentation and/or | report. | | | | | | | |
| Coursework, presentation and/or | report. | | | | | | | |
| Examination 試験期間内にけぼせたもたい | | | | | | | | |
| 記録表別町中にには凹も打れたい None during exam period | | | | | | | | |
| Details of examination | | | | | | | | |
| Other information | | | | | | | | |
| Reference URL | | | | | | | | |
| Office hours | | | | | | | | |
| Relations to attainment objective | s of learning and | education | | | | | | |

(M41630250)Advanced System, Control and Robotics I[Advanced System, Control and Robotics I]

| Subject name[English] | Advanced System | n, Control a | and Robot | tics I[Advanced Sys | stem, Control and F | Robotics I] | | | | |
|-------------------------------------|------------------------|-------------------------|------------|----------------------|--------------------------------|-------------------|--|--|--|--|
| Schedule number | M41630250 | Subject | area | Advanced | Required or | Elective | | | | |
| | | | | Mechanical | elective | | | | | |
| | | | | Engineering | | | | | | |
| Time of starting a course | Fall term | Day o | f the | Thu.4~4 | Credit(s) | 2 | | | | |
| | | week,pei | riod | | | | | | | |
| Faculty | Graduate Progran | n for Maste | er's Degre | e | Subject grade | 1~ | | | | |
| Department Offered | Mechanical Engin | eering | | | Beggining | M1, M2 | | | | |
| | 。 <i> </i> | grade | | | | | | | | |
| Charge teacher name[Roman | S1糸教務安員1 | I 不我仂女員 IKEI Kyomu Im⁻o | | | | | | | | |
| alphabet mark | | | | | | | | | | |
| Numbering | | | | | | | | | | |
| Objectives of class | | | | | | | | | | |
| This lecture aims to provide a bro | oad understanding o | of the cont | rol and ro | botics available for | the master thesis | research work of | | | | |
| a student. | | | | | | | | | | |
| This lecture aims to provide a bro | oad understanding o | of the cont | rol and ro | botics available for | ^r the master thesis | research work of | | | | |
| a student. | | | | | | | | | | |
| Contents of class | | 61 · / | | | | | | | | |
| The class provides both of funda | amental knowledge | of his/her | master t | hesis research wor | k and the most ad | vanced results in | | | | |
| the related field by reading rese | earch papers and n | nonographs | s. The co | ntents of the clas | s depend on the s | supervisor. To be | | | | |
| The share musicles hath of fund | ors. | - c -!- / | | | | | | | | |
| The class provides both of funda | amentai knowledge | of nis/ner | master t | nesis research wor | k and the most ad | vanced results in | | | | |
| the related field by reading rese | earch papers and n | nonographs | s. The co | ntents of the clas | s depend on the s | supervisor. To be | | | | |
| Self Preparation and Paview | ISORS. | | | | | | | | | |
| Sell Freparation and Neview | view | | | | | | | | | |
| Data da atra | | | | | | | | | | |
| Related subjects | | | | | | | | | | |
| | | | | | | | | | | |
| Notes for textbook | | | | | | | | | | |
| Textbook or material will be made | e available from the | supervisor | ſS. | | | | | | | |
| Textbook or material will be made | e available from the | supervisor | ſS. | | | | | | | |
| Notes for reference | | | | | | | | | | |
| | | | | | | | | | | |
| Goals to be achieved | | | | | | | | | | |
| To acquire fundamental knowledg | e of individual resea | arch fields. | | | | | | | | |
| To acquire the ability to find prob | lems, the ability to | solve the p | problems, | and the presentation | on skill. | | | | | |
| | | | | | | | | | | |
| To acquire fundamental knowledg | e of individual resea | arch fields. | | | | | | | | |
| To acquire the ability to find prob | lems, the ability to | solve the p | problems, | and the presentation | on skill. | | | | | |
| | | | | | | | | | | |
| Evaluation of achievement | | | | | | | | | | |
| Coursework, presentation and/or | report. | | | | | | | | | |
| Coursework, presentation and/or | report. | | | | | | | | | |
| | | | | | | | | | | |
| 試験期間中には何も行わない | | | | | | | | | | |
| None during exam period | | | | | | | | | | |
| Details of examination | | | | | | | | | | |
| | | | | | | | | | | |
| Other information | | | | | | | | | | |
| | | | | | | | | | | |
| Reference URL | | | | | | | | | | |
| | | | | | | | | | | |
| Office hours | | | | | | | | | | |
| | | | | | | | | | | |
| Relations to attainment objective | s of learning and e | ducation | | | | | | | | |
| | | | | | | | | | | |

(M41630270)Advanced Energy and Environmental Engineering I[Advanced Energy and Environmental Engineering I]

| Subject name[English] | Advanced Free | and Environment | al Engineering I | Advanced Energy ar | nd Environmental | | | |
|---|--|--|--|--|--|--|--|--|
| ondor namolensioni | Engineering I] | | | Avanced Lifergy af | | | | |
| Schedule number | M41630270 | Subject area | Advanced Mechanical Engineering | Required or elective | Elective | | | |
| Time of starting a course | Fall term | Day of the | Fri.4~4 | Credit(s) | 2 | | | |
| Faculty | Graduate Progra | m for Master's Degr | ee | Subject grade | 1~ | | | |
| Department Offered | Mechanical Engir | Mechanical Engineering M1, M2 | | | | | | |
| Charge teacher name[Roman alphabet mark] | harge teacher name[Roman S1系教務委員 1kei kyomu lin-S phabet mark] | | | | | | | |
| Numbering | | | | | | | | |
| Objectives of class This lecture aims to provide a bro- research work of a student. This lecture aims to provide a bro- research work of a student. Contents of class | oad understanding oad understanding | of the energy and e | nvironmental engi | neering available for t neering available for t | the master thesis | | | |
| the related field by reading rese announced by individual supervise The class provides both of funda the related field by reading rese announced by individual supervise Self Preparation and Review | imental knowledge arch papers and ors. imental knowledge arch papers and ors. | or nis/ner master t monographs. The co of his/her master t monographs. The co | nesis research w ontents of the cla hesis research w ontents of the cla | ork and the most ad ass depend on the s ork and the most ad ass depend on the s | vanced results in upervisor. To be vanced results in upervisor. To be | | | |
| Related subjects | | | | | | | | |
| Notes for textbook Textbook or material will be made Textbook or material will be made Notes for reference | e available from the e available from the | e supervisors. e supervisors. | | | | | | |
| Goals to be achieved | | | | | | | | |
| To acquire fundamental knowledg To acquire the ability to find prob | e of individual rese lems, the ability to | earch fields. solve the problems. | , and the presenta | tion skill. | | | | |
| To acquire fundamental knowledg To acquire the ability to find prob | e of individual rese lems, the ability to | earch fields. Solve the problems, | and the presenta | tion skill. | | | | |
| Evaluation of achievement Coursework, presentation and/or | report. | | | | | | | |
| Coursework, presentation and/or | report. | | | | | | | |
| Examination 試験期間中には何も行わない | | | | | | | | |
| None during exam period Details of examination | | | | | | | | |
| Other information | | | | | | | | |
| Reference URL | | | | | | | | |
| Office hours | | | | | | | | |
| Relations to attainment objective | s of learning and e | education | | | | | | |

| (M41630320)Properties | s and Applicati | ons of Engineering Mate | orials[Properties a | and Applications of | Engineering Ma | terials] | | | | | |
|--------------------------|------------------|--|-------------------------|----------------------|----------------|----------------|--|--|--|--|--|
| Subject | Properties a | and Applications of Er | ngineering Materi | ials[Properties and | Applications | of Engineering | | | | | |
| name[English] | Materials] | | | | | | | | | | |
| Schedule number | M41630320 | | Subject area | Advanced | Required or | Elective | | | | | |
| | | | | Mechanical | elective | | | | | | |
| | | | | Engineering | | | | | | | |
| Time of starting a | Fall2 term | | Day of the | Thu.2~2 | Credit(s) | 1 | | | | | |
| course | | | week,period | | | | | | | | |
| Faculty | Graduate Pr | Graduate Program for Master's Degree Subject | | | | | | | | | |
| | | grade | | | | | | | | | |
| Department Offered | Mechanical I | Mechanical Engineering Beggining M1, M2 | | | | | | | | | |
| | | grade | | | | | | | | | |
| Charge teacher | 三浦 博己 1 | MIURA Hiromi | | | | | | | | | |
| name[Roman | | | | | | | | | | | |
| alphabet mark | | | | | | | | | | | |
| Numbering | | | | | | | | | | | |
| Objectives of class | | | | | | | | | | | |
| Understanding of prope | erties and appli | cations of engineering m | naterials | | | | | | | | |
| Understanding of prope | erties and appli | cations of engineering m | naterials | | | | | | | | |
| Contents of class | | | | | | | | | | | |
| 1. Engineering materials | s and manufact | uring processes | | | | | | | | | |
| 2. Crystal structures | | | | | | | | | | | |
| 3. Defects in crystals | | | | | | | | | | | |
| 4. Diffusion in sold | | | | | | | | | | | |
| 5. Phase diagrams of a | lloys | | | | | | | | | | |
| 6. Strengthening of met | tallic materials | | | | | | | | | | |
| 7. Composites | | | | | | | | | | | |
| 8. Exam. | | | | | | | | | | | |
| 1. Engineering materials | s and manufact | and manufacturing processes | | | | | | | | | |
| 2. Crystal structures | | | | | | | | | | | |
| 3. Defects in crystals | | | | | | | | | | | |
| 4. Diffusion in sold | | | | | | | | | | | |
| 5. Phase diagrams of a | llovs | | | | | | | | | | |
| 6. Strengthening of me | tallic materials | | | | | | | | | | |
| 7. Composites | | | | | | | | | | | |
| 8. Exam. | | | | | | | | | | | |
| Self Preparation and R | eview | | | | | | | | | | |
| Basic knowledge neces | sarv to unders | tand lecture. Please rea | d books suggeste | ed bellow in advance | Э. | | | | | | |
| Basic knowledge neces | sary to unders | tand lecture. Please rea | id books suggeste | ed bellow in advance | Э. | | | | | | |
| Related subjects | | | | | | | | | | | |
| - | | | | | | | | | | | |
| Notes for textbook | | | | | | | | | | | |
| Lecture using pot | | | | | | | | | | | |
| Lecture using ppt. | | | | | | | | | | | |
| Reference1 | Book title | Materials science and | engineering | | ISBN | 978-1-118- | | | | | |
| | | | | | | 31922-2 | | | | | |
| | Author | W.D.Callister Jr and | Publisher | Willy | Publish | 20174 | | | | | |
| | | D G Rethwisch | | , | vear | | | | | | |
| Reference? | Book title | Foundations of materi | I ials science and e | angineering | ISBN | 978-007- | | | | | |
| | | | | Signooning | | 131114-4 | | | | | |
| | Author | WF Smith and | Publisher | Mc Graw Hill | Publieb | 2011 | | | | | |
| | | J Hashemi | | | Vear | 2011 | | | | | |
| Notes for reference | I | | I | I | , you. | 1 | | | | | |
| | | | | | | | | | | | |
| Ocale to be extracted as | | | | | | | | | | | |
| Goals to be achieved | | | | | | | | | | | |
| Understanding of prope | erties and appli | cations of engineering m | naterials explained | d in the lectures | | | | | | | |
| Understanding of prope | erties and appli | cations of engineering m | naterials explained | d in the lectures | | | | | | | |
| Evaluation of achievem | lent | | | | | | | | | | |
| Short tests 50%, Final e | exam. 50% | | | | | | | | | | |

| Short tests 50%, Final exam. 50% |
|--|
| Examination |
| 定期試験を実施(対面) |
| Examination(Face to Face) |
| Details of examination |
| |
| Other information |
| Hiromi Miura: |
| Room: D-508, ext.: 6697, e-mail: miura@me.tut.ac.jp |
| Hiromi Miura: |
| Room: D-508, ext.: 6697, e-mail: miura@me.tut.ac.jp |
| Reference URL |
| (miura) http://www.str.me.tut.ac.jp/ |
| (miura) http://www.str.me.tut.ac.jp/ |
| Office hours |
| (miura) anytime to e-mail address: miura@me.tut.ac.jp |
| (miura) anytime to e-mail address: miura@me.tut.ac.jp |
| Relations to attainment objectives of learning and education |
| |
| |
| |
| |
| |
| Key words |
| |

(M41630330)Advances in Mechanical Design[Advances in Mechanical Design]

| Subject name[English] | Advances in Mechanical Design[Advances in Mechanical Design] | | | | | | |
|--|--|----------------------|-------------------------------|-------------------------|---------------------|--|--|
| Schedule number | M41630330 | Subject area | Advanced | Required or | Elective | | |
| | | | Mechanical | elective | _1000140 | | |
| | | | Engineering | 0100040 | | | |
| Time of starting a course | Fall2+Spring1 | Day of the | Tue.1~1 | Credit(s) | 2 | | |
| | | week.period | | | - | | |
| Faculty | Graduate Program | n for Master's Degre | e | Subject grade | 2~ | | |
| Department Offered | Mechanical Engin | eering | | Beggining | M2 | | |
| - | - | | | grade | | | |
| Charge teacher name[Roman | 河村 庄造,柴田 | 隆行 KAWAMURA | Shozo, SHIBATA T | akayuki | | | |
| alphabet mark] | | | | | | | |
| Numbering | | | | | | | |
| Objectives of class | | | | | | | |
| This class is separated into two r | oarts: | | | | | | |
| | | | | | | | |
| Part 1 (Prof Shibata): | | | | | | | |
| The objectives of this course is t | o introduce fundan | nentals of micromac | hining technologies | (microfabrication t | echnologies) and | | |
| their application in the developme | ent "Micro Electro | Mechanical System | (MEMS) ["] and "Micr | o Total Analysis Sv | $(\mu TAS)''$ | | |
| | | | | o rotar, maryolo by | | | |
| Part 2 (Prof Kawamura) | | | | | | | |
| The class aims to give basis in | owledge on vibrati | on engineering in n | articular on the m | odeling of multi-do | gree-of-freedom | | |
| system and model analysis | owieuge on vibrati | on engineering, in p | | outing of multi-de | | | |
| This class is separated into two r | arts. | | | | | | |
| | | | | | | | |
| Port 1 (Prof Shibata) | | | | | | | |
| The objectives of this course is t | o introduce fundan | nentals of micromac | hining technologies | (microfabrication t | echnologies) and | | |
| their application in the development | ant "Micro Electro | Mechanical System | (MEMS)" and "Micr | ro Total Analysis Sy | $(\mu T\Delta S)''$ | | |
| | | | | o Total Analysis Gy | $(\mu 1A3)$. | | |
| | | | | | | | |
| Part 2 (Prof. Kawamura): | audadea an uibuati | | autioulou on the m | مطمائيهم مقربهم بالجاسم | muss of fuss dam | | |
| avetem and model englycia | owiedge on vibrati | on engineering, in p | articular, on the m | lodeling of multi-de | gree-oi-ireedom | | |
| Contents of class | | | | | | | |
| Part 1 (Prof Shibata) | | | | | | | |
| Micromachining Engineering | | | | | | | |
| 1. Introduction of MEMS and μ T. | AS | | | | | | |
| 2. Photolithography | | | | | | | |
| 3. Wet etching and Dry etching | | | | | | | |
| 4. Physical vapor deposition (PVI |) and Chemical va | por deposition (CVD |) | | | | |
| 5. Plating and Electroforming | | | | | | | |
| 6. Bonding processes | | | | | | | |
| 7. Surface micromachining and Bulk micromachining | | | | | | | |
| 8. Presentation and discussion | | | | | | | |
| | | | | | | | |
| Part 2 (Prof. Kawamura): | | | | | | | |
| Vibration Engineering | | | | | | | |
| 1&2. Modeling of multi-degree-of-freedom system(MDOF system) | | | | | | | |
| 3&4. Modal analysis of MDOF system (eigenvalue analysis, etc.) | | | | | | | |
| 5−7. Modal analysis of MDOF system (Component mode synthesis method) | | | | | | | |
| Part 1 (Prof. Shibata): | | | | | | | |
| Micromachining Engineering | | | | | | | |
| 1. Introduction of MEMS and μ LAS | | | | | | | |
| 2. Photolithography 3. Wet etching and Dry etching | | | | | | | |
| 4. Physical vanor denosition (PVD) and Chemical vanor denosition (CVD) | | | | | | | |
| 5 Plating and Electroforming | | | | | | | |
| 6. Bonding processes | | | | | | | |
| 0. Doriging processes | | | | | | | |
| 8 Presentation and discussion | | | | | | | |
| o. Trosontation and discussion | | | | | | | |

Part 2 (Prof. Kawamura): Vibration Engineering 1&2. Modeling of multi-degree-of-freedom system(MDOF system) 3&4. Modal analysis of MDOF system (eigenvalue analysis, etc.) 5-7. Modal analysis of MDOF system (Component mode synthesis method) Self Preparation and Review Part 1 (Prof. Shibata) Students are required to prepare and review each lesson. Useful information on MEMS technologies can be obtained from the following website; http://www.memsnet.org/mems/ Part 1 (Prof. Shibata): Students are required to prepare and review each lesson. Useful information on MEMS technologies can be obtained from the following website; http://www.memsnet.org/mems/ **Related subjects** Part 1 (Prof. Shibata): A fundamental knowledge of physics and chemistry is required. Part 2 (Prof. Kawamura): Fundamental knowledge on vibration engineering and mathematics on linear algebra and ordinary differential equation, and engineering mechanics. Part 1 (Prof. Shibata): A fundamental knowledge of physics and chemistry is required. Part 2 (Prof. Kawamura): Fundamental knowledge on vibration engineering and mathematics on linear algebra and ordinary differential equation, and engineering mechanics. Notes for textbook Part 1 (Prof. Shibata): handout Part 2 (Prof. Kawamura): handout Part 1 (Prof. Shibata): handout Part 2 (Prof. Kawamura): handout Notes for reference Part 1 (Prof. Shibata): Useful information on MEMS technologies can be obtained from the following website; http://www.memsnet.org/mems/ Reference: (1) M.J. Madou, "Fundamentals of Microfabrication, 2nd ed.", CRC Press, 2002. (2) S. Franssila, "Introduction to Microfabrication", John Wiley & Sons, 2004. (3) M. Gad-El-Hak, "The MEMS Handbook, 2nd ed.", CRC Pr I Llc, 2006. Part 1 (Prof. Shibata) Useful information on MEMS technologies can be obtained from the following website; http://www.memsnet.org/mems/ Reference: (1) M.J. Madou, "Fundamentals of Microfabrication, 2nd ed.", CRC Press, 2002. (2) S. Franssila, "Introduction to Microfabrication", John Wiley & Sons, 2004. (3) M. Gad-El-Hak, "The MEMS Handbook, 2nd ed.", CRC Pr I Llc, 2006. Goals to be achieved Part (1) (Prof. Shibata) To gain an understanding of the principles of micromachining technologies and to apply knowledge of the technologies to the design and manufacturing of a microdevice. Part (2) (Prof. Kawamura) get the basic knowledge on vibration engineering and some of their analytical methods. Part (1) (Prof. Shibata) To gain an understanding of the principles of micromachining technologies and to apply knowledge of the technologies to the design and manufacturing of a microdevice. Part (2) (Prof. Kawamura) get the basic knowledge on vibration engineering and some of their analytical methods. Evaluation of achievement Part 1 (Prof. Shibata) Presentation (70%) and classroom performance (30%). An oral presentation on micromachining technologies for the fabrication of MEMS and μ TAS devices will be imposed during the course of class.

| Part 2 (Prof. Kawamura): | | | | | | |
|---|--|--|--|--|--|--|
| Some short reports during the class (30%) and a comprehensive report after final class (70%) | | | | | | |
| Part 1 (Prof. Shibata): | | | | | | |
| Presentation (70%) and classroom performance (30%). An oral presentation on micromachining technologies for the fabrication | | | | | | |
| of MEMS and μ TAS devices will be imposed during the course of class. | | | | | | |
| | | | | | | |
| Part 2 (Prof. Kawamura): | | | | | | |
| Some short reports during the class (30%) and a comprehensive report after final class (70%) | | | | | | |
| Examination | | | | | | |
| レポートで実施 | | | | | | |
| By Report | | | | | | |
| Details of examination | | | | | | |
| | | | | | | |
| Other information | | | | | | |
| Prof. Shibata: Room number D-605. Extension phone 6693. E-mail shibata@me.tut.ac.ip | | | | | | |
| Prof. Kawamura: Room D-404. Extension phone 6674. E-mail kawamura@me.tut.ac.jp | | | | | | |
| Prof. Shibata: Room number D-605. Extension phone 6693. E-mail shibata@me.tut.ac.jp | | | | | | |
| Prof. Kawamura: Room D-404. Extension phone 6674. E-mail kawamura@me.tut.ac.ip | | | | | | |
| Reference URL | | | | | | |
| | | | | | | |
| Office hours | | | | | | |
| Anvtime. Contact me by email before coming if possible. | | | | | | |
| Anytime. Contact me by email before coming if possible. | | | | | | |
| Relations to attainment objectives of learning and education | | | | | | |
| | | | | | | |
| | | | | | | |
| | | | | | | |
| (E)国内外において活躍できる表現力・コミュニケーションカ | | | | | | |
| 技術文章,技術論文、山頭での報告・発表及び情報メティアを通じ,自分の論点や考え,研究成果などを国の内外に効果的に | | | | | | |
| 表現し、コミュニケーションする能力 | | | | | | |
| | | | | | | |
| | | | | | | |
| Key words | | | | | | |
| Prof. Shibata: Microfabrication, Etching, Deposition, Plating, Bonding / Prof. Kawamura: vibration, modal analysis, Component | | | | | | |
| modes Synthesis | | | | | | |

Prof. Shibata: Microfabrication, Etching, Deposition, Plating, Bonding / Prof. Kawamura: vibration, modal analysis, Component modes Synthesis

| (M41630350)Advances in Thermal and Fluid Mechanics | Advances in Thermal and Fluid Mechanics] |
|--|--|
|--|--|

| Subject name[English] | Advances in Thermal and Flui | id Mechanics[Advance | s in Thermal and F | luid Mechanics] | | |
|--|--|----------------------------|----------------------|-------------------|-----------------|--|
| Schedule number | M41630350 | Subject area | Advanced | Required or | Elective | |
| | | | Mechanical | elective | | |
| | | | Engineering | ciccure | | |
| Time of starting a | Fall1 term | Day of the | Mon 1~2 | Gredit(s) | 2 | |
| course | | week period | | | - | |
| Faculty | Graduate Program for Master | r's Degree | | Subject | 2~ | |
| 1 douity | | 0 200100 | | grade | | |
| Department Offered | Mechanical Engineering | | | Beggining | M2 | |
| | | | | grade | | |
| Charge teacher | 野田進,柳田秀記 NODA S | Susumu, YANADA Hide | eki | 9 | | |
| name[Roman_alphabet | | | | | | |
| mark] | | | | | | |
| Numbering | | | | | | |
| | | | | | | |
| Objectives of class | | | | | | |
| Applied Combustion Eng | gineering by Professor Noda: | | | | | |
| The global environment | is a subject we must consider i | n our engineering activ | vities. Some pollut | ions come from c | ombustion and | |
| disperse into the atmos | phere. Such phenomena take pla | ace in turbulent reacti | ng flows. In the cla | ass, the mathema | tical treatment | |
| of such flows will be lec | tured. In paticular, we focus on | modeling of turbulent | combustion based | on stochastic me | thods. | |
| | | | | | | |
| Applied fluid engineering | g by Prof.Yanada: | | | | | |
| The class treats the dv | namics of fluid in a pipe, which | is a typical distributed | parameter syster | n. The primarv ob | iectives of the | |
| class are to understand | d transient phenomena in a pir | be, the theories that | describe the dvna | mic behaviors of | fluid. and the | |
| methods to analyze the | m | | | | nana, and ene | |
| Applied Compustion Eng | gineering by Professor Noda | | | | | |
| The global environment | is a subject we must consider i | in our engineering activ | vities. Some pollut | ions come from c | ombustion and | |
| disperse into the atmos | nhere. Such phenomena take pl | ace in turbulent reacti | ng flows. In the ol | acc the mathema | tical treatment | |
| uisperse into trie atrios | tured in acticular we focus on | ace in curbulent reactions | ng nows. In the ca | | | |
| of such hows will be lec | tured. In paticular, we locus on | modeling of turbulent | compustion based | on stochastic me | ethous. | |
| | | | | | | |
| Applied fluid engineering | ς by Prof.Yanada: | | | | | |
| The class treats the dy | namics of fluid in a pipe, which | is a typical distributed | parameter syster | n. The primary ob | jectives of the | |
| class are to understand | d transient phenomena in a pip | pe, the theories that | describe the dyna | mic behaviors of | fluid, and the | |
| methods to analyze the | m | | | | | |
| Contents of class | | | | | | |
| Applied Combustion Eng | gineering by Professor Noda: | | | | | |
| 1.Introduction | | | | | | |
| 2.Premixed combustion | | | | | | |
| 3.Nonpremixed combust | ion | | | | | |
| 4.Turbulent combustion | | | | | | |
| 5.Statistical description | of turbulent combustion | | | | | |
| 6.Flamelet model | | | | | | |
| 7 Probability density function(ndf) model | | | | | | |
| 8.Examination | 8 Examination | | | | | |
| | | | | | | |
| Applied fluid appingation | thy Prof Vanada: | | | | | |
| Applied Itula engineering | ; by Froi Tanada: | ion in Aires Jourster C | leeeleee Broos | | | |
| Ist week: Une-dimensional wave equation and its solution in time domain for lossless lines | | | | | | |
| 2nd week: Water hammer phenomenon | | | | | | |
| 3rd week: Solution of wave equation in Laplace domain | | | | | | |
| 4th week: Steady friction model and unsteady friction model, Propagation constant | | | | | | |
| 5th week: Oscillatory laminar flow in pipe | | | | | | |
| oth week: Hydraulic imp | 6th week: Hydraulic impedance, reflection coefficient, and frequency response analysis | | | | | |
| 7th week: Characteristic | h week: Characteristics method | | | | | |
| 8th week: Examination | | | | | | |
| | | | | | | |
| This class ought to oper | n in alternate years, thus see th | e teaching schedule. | | | | |
| Applied Combustion Eng | vineering by Professor Noda | | | | | |
| | | | | | | |
| 1.Introduction | | | | | | |

3.Nonpremixed combustion
4.Turbulent combustion
5.Statistical description of turbulent combustion
6.Flamelet model
7.Probability density function(pdf) model
8.Examination

Applied fluid engineering by Prof.Yanada: 1st week: One-dimensional wave equation and its solution in time domain for lossless lines 2nd week: Water hammer phenomenon 3rd week: Solution of wave equation in Laplace domain 4th week: Steady friction model and unsteady friction model, Propagation constant 5th week: Oscillatory laminar flow in pipe 6th week: Hydraulic impedance, reflection coefficient, and frequency response analysis 7th week: Characteristics method

8th week: Examination

This class ought to open in alternate years, thus see the teaching schedule. Self Preparation and Review

Related subjects

Applied Combustion Engineering by Professor Noda:

Fundamental knowledge of the fluid dynamics is required, but the statistics and the stochastics will be lectured with basic contents.

Applied fluid engineering by Prof.Yanada:

Fluid mechanics, Mechanics, Laplace transform

Applied Combustion Engineering by Professor Noda:

Fundamental knowledge of the fluid dynamics is required, but the statistics and the stochastics will be lectured with basic contents.

Applied fluid engineering by Prof.Yanada:

Fluid mechanics, Mechanics, Laplace transform

Notes for textbook

Prints will be distributed.

Prints will be distributed.

| Reference1 | Book title | Principles of Comb | ISBN | | | |
|------------|------------|-----------------------------|-----------|----------------------|--------------|--|
| | Author | Kuo,K.K. | Publisher | John Wiley & Sons | Publish year | |
| Reference2 | Book title | Fluid Transients in | Systems | ISBN | | |
| | Author | Wylie, Streeter, Lisheng | Publisher | McGraw-Hill | Publish year | |

Notes for reference

Goals to be achieved

Applied Combustion Engineering by Professor Noda:

Governing equations of turbulent combustion are derivable from fundamental equations.

Applied fluid engineering by Prof.Yanada:

To understand the transient phenomena that occur in a pipe.

To understand the fundamental theories that describe the dynamic behaviors of fluid in a pipe.

Applied Combustion Engineering by Professor Noda: Governing equations of turbulent combustion are derivable from fundamental equations.

Applied fluid engineering by Prof.Yanada: To understand the transient phenomena that occur in a pipe. To understand the fundamental theories that describe the dynamic behaviors of fluid in a pipe.

Evaluation of achievement

Applied Combustion Engineering by Professor Noda: Evaluation is based on reports.

Applied fluid engineering by Prof.Yanada: Written reports:50%, Examination:50%

The average mark of the two professors' evaluations is the final evaluation. Applied Combustion Engineering by Professor Noda: Evaluation is based on reports.

Applied fluid engineering by Prof.Yanada: Written reports:50%, Examination:50%

The average mark of the two professors' evaluations is the final evaluation.

Examination レポートで実施 By Report

Details of examination

Other information Prof.Noda

Room: D411, Tel.(Ext.): 6681, e-mail: noda@me.tut.ac.jp

Prof.Yanada Room: D309, Tel.(Ext.): 6668, e-mail: yanada@me.tut.ac.jp Prof.Noda Room: D411, Tel.(Ext.): 6681, e-mail: noda@me.tut.ac.jp

Prof.Yanada

Room: D309, Tel.(Ext.): 6668, e-mail: yanada@me.tut.ac.jp

Reference URL

Prof.Noda http://www.me.tut.ac.jp/ece/main_en.html

Prof.Yanada http://www.tut.ac.jp/english/schools/faculty/me/13.html Prof.Noda http://www.me.tut.ac.jp/ece/main_en.html

Prof.Yanada http://www.tut.ac.jp/english/schools/faculty/me/13.html

Office hours

Prof.Noda: Any time in afternoon

Prof.Yanada: Basically, any time is OK. The time for discussion can be determined through e-mails when Prof.Yanada is abscent from his office.

Prof.Noda: Any time in afternoon

Prof.Yanada: Basically, any time is OK. The time for discussion can be determined through e-mails when Prof.Yanada is abscent from his office.

Relations to attainment objectives of learning and education
(M41630380)Robotics[Robotics]

| Subject | Robotics[Robotics] | | | | | | |
|---------------------------------------|--|---------------------------|---------------------------------------|-------------------------|----------------|--|--|
| name[English] | | 1 | 1 | | | | |
| Schedule number | M41630380 | Subject area | Advanced Mechanical Engineering | Required or elective | Elective | | |
| Time of starting a course | Fall term | Day of the week,period | Fri.2~2 | Credit(s) | 2 | | |
| Faculty | Graduate Program for Master's Deg | gree | | Subject grade | 2~ | | |
| Department Offered | Mechanical Engineering Beggining M2 grade | | | | | | |
| Charge teacher name[Roman alphabet | 内山 直樹 UCHIYAMA Naoki | | | | | | |
| mark] | | | | | | | |
| Numbering | | | | | | | |
| Objectives of class | | | | | | | |
| Provides fundamentals | of robotics, i.e., kinematics, dynamic | s and motion co | ntrol of multiple rig | gid-bodies conne | cted in series | | |
| with revolute or prismat | ic joints. | | | | | | |
| Provides fundamentals | of robotics, i.e., kinematics, dynamic | s and motion co | ntrol of multiple rig | gid-bodies conne | cted in series | | |
| with revolute or prismat | ic joints. | | | | | | |
| Contents of class | | | | | | | |
| 1. Representation and t | ransformation of positions and orient | ations in 3-D spa | се | | | | |
| 1–1. Description of posi | tions and orientations in 3-D space. | | | | | | |
| 1-2. Transformation of | positions and orientations of rigid-obj | iects. | | | | | |
| 1-3. Properties of trans | formation matrix. | | | | | | |
| 2. Kinematics | | | | | | | |
| 2–1. Description of relat | tive positions and orientations of man | nipulator links. | | | | | |
| 2–2. Transformation of I | manipulator positions and orientations | S. | | | | | |
| 2–3. Inverse kinematics. | | | | | | | |
| 3. Velocities and static | torces | | | | | | |
| 3-1. Linear and rotation | al velocities of rigid-objects. | | | | | | |
| 3-2. Velocities of manip | ulator links. | | | | | | |
| J-J. Static forces in ma | inipulators. | | | | | | |
| 4. Dynamics | ty dynamics | | | | | | |
| 4-2 Newton-Fuler and | ay aynamics. Lagrangian formulations of manipulate | or dynamics | | | | | |
| 5 Control | | aynannos. | | | | | |
| 5–1. Linear control | | | | | | | |
| 5–2. Nonlinear control | | | | | | | |
| 1. Representation and t | ransformation of positions and orient | ations in 3-D spa | ce | | | | |
| 1–1. Description of posi | tions and orientations in 3-D space. | | | | | | |
| 1–2. Transformation of | positions and orientations of rigid-obj | jects. | | | | | |
| 1−3. Properties of trans | formation matrix. | | | | | | |
| 2. Kinematics | | | | | | | |
| 2−1. Description of relat | tive positions and orientations of man | nipulator links. | | | | | |
| 2–2. Transformation of I | manipulator positions and orientations | s. | | | | | |
| 2-3. Inverse kinematics. | | | | | | | |
| 3. Velocities and static | torces | | | | | | |
| 3–1. Linear and rotation | al velocities of rigid-objects. | | | | | | |
| 3-2. Velocities of manip | ulator links. | | | | | | |
| J-J. Static forces in ma | inipulators. | | | | | | |
| 4. Dynamics | ty dynamics | | | | | | |
| 4-2 Newton-Fuler and | ay ayriannes. Lagrangian formulations of manipulate | or dynamics | | | | | |
| 5 Control | | or aynannos. | | | | | |
| 5-1. Linear control | | | | | | | |
| 5-2. Nonlinear control | | | | | | | |
| Self Prenaration and Re | view | | | | | | |
| Read the handouts befo | re the lecture. | | | | | | |
| | | | | | | | |

| Read the handouts I | before the lecture | | | | | |
|---------------------------------------|---------------------|-------------------------|----------------|---------------------|--------------|------|
| Related subjects | | | | | | |
| Fundamentals of line | ear algebra. mecha | nics and control theor | v. | | | |
| Fundamentals of line | ear algebra, mecha | nics and control theory | , y. | | | |
| Notes for textbook | | | | | | |
| Handouts will be pre | epared. | | | | | |
| Handouts will be pre | epared. | | | | | |
| Reference1 | Book title | Introduction to Rob | otics: Mechani | cs and Control. 3rd | ISBN | |
| | | Edition | | | | |
| | Author | J. J. Craig | Publisher | Prentice Hall | Publish vear | 2005 |
| Reference2 | Book title | Robot Modeling and | Control | | ISBN | |
| | Author | M W Spong S | Dublisher | John Wiley & | Bublich veer | 2006 |
| | Aution | Hutchinson M | Fublisher | Sons | Fublish year | 2000 |
| | | Vidvasagar | | 00113 | | |
| Notoo for reference | I | Viuyasagai | | | | |
| | , | | | | | |
| | - | | | | | |
| Goals to be achieve | d | | | | | |
| Be able to derive kir | nematics and dyna | mics of robotic manipu | lators. | | | |
| Be able to design m | otion controllers f | or robotic manipulators | | | | |
| Be able to derive kir | nematics and dyna | mics of robotic manipu | lators. | | | |
| Be able to design m | otion controllers f | or robotic manipulators | - | | | |
| Evaluation of achiev | /ement | | | | | |
| Grade will be detern | nined only from th | e end-of-term exam so | ore. | | | |
| Grade will be detern | nined only from th | e end-of-term exam so | ore. | | | |
| Examination | | | | | | |
| 定期試験を実施(対 | ·面) | | | | | |
| Examination(Face to | o Face) | | | | | |
| Details of examinati | ion | | | | | |
| | | | | | | |
| Other information | | | | | | |
| Office: Room D-406 | i, E−mail uchiyama | @tut.jp | | | | |
| Office: Room D-406 | , E−mail uchiyama | @tut.jp | | | | |
| Reference URL | | | | | | |
| | | | | | | |
| Office hours | | | | | | |
| Contact the lecture | r by e-mail first | | | | | |
| Contact the lecturer by e-mail first. | | | | | | |
| Peletione to etteine | n by e maininist. | learning and education | | | | |
| Noiations to attdinin | | ioarning and outcation | | | | |
| | | | | | | |
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| | | | | | | |
| Key words | | | | | | |
| | | | | | | |
| | | | | | | |

(M41630400)Robot Kinematics[Robot Kinematics]

| Subject | Robot Kinematics[Robot Kinematics] | | | | | | |
|---|---|--|--------------------------|------|--------------------|------------------|----------------|
| name[English] | | | | | | | |
| Schedule number | M41630400 | | Subject area | 3 | Advanced | Required or | Elective |
| | | | | | Mechanical | elective | |
| | | | | | Engineering | a w () | |
| lime of starting a course | Fall1 term | | Day of th week,period | 10 | Fri.2~2 | Credit(s) | 1 |
| Faculty | Graduate Pro | ogram for Master's Deg | gree | | | Subject grade | 1~ |
| Department Offered | Mechanical E | Mechanical Engineering Beggining M1, M2 grade | | | | | |
| Charge teacher | 内山 直樹し | ICHIYAMA Naoki | | | | grado | |
| name[Roman alphabet | | | | | | | |
| mark] | | | | | | | |
| Numbering | | | | | | | |
| | | | | | | | |
| Objectives of class | | | | | | | |
| Provides fundamental k | inematics of ro | botic manipulators (m | nultiple rigid-bo | odie | s connected in ser | ies with revolut | e or prismatic |
| joints). | · | | | | | | |
| rovides tundamental k | mematics of ro | pootic manipulators (m | iuitipie rigid-bo | die | s connected in ser | ies with revolut | e or prismatic |
| joints). | | | | | | | |
| 1 Depresentation and th | | f notitions and estant. | ations in 2-D a | | | | |
| 1. Representation and the | ransformation o | t positions and orienta | ations in 3-D s | pac | e | | |
| 1-1. Description of position | tions and orien | tations in 3-D space. | | | | | |
| 1-2. Transformation of 1.2. Dues set | positions and o | rientations of rigid-obj | jects. | | | | |
| 1-3. Properties of trans | nstormation matrix. | | | | | | |
| 2. Kinematics 2–1. Description of relat | Kinematics Description of valative positions and eviprotations of manipulators links | | | | | | |
| 2-1. Description of relat | -1. Description of relative positions and orientations of manipulator links. | | | | | | |
| 2-2. Transformation of 1 | of manipulator positions and orientations. | | | | | | |
| 3 Velocities and static | ys. | | | | | | |
| 3-1 Linear and rotation | atic torces | | | | | | |
| 3-2 Velocities of manin | ulator links | ligid objects. | | | | | |
| 3-3 Static forces in ma | nipulators | | | | | | |
| | inpulators. | | | | | | |
| 1 Denvecentation and t | | functions and estant. | ations in 2-D a | | | | |
| 1. Representation and the | ransformation o | of positions and orienta | ations in 3-D s | pac | e | | |
| 1-1. Description of posi | cions and orien | riantations of rigid-abi | iaata | | | | |
| 1-2. Transformation of trans | formation matr | iv | Jeous. | | | | |
| 2 Kinematics | 1-3. Properties of transformation matrix. | | | | | | |
| 2–1 Description of relat | Annematics Description of relative positions and orientations of manipulater links | | | | | | |
| 2-1. Description of relative positions and orientations of manipulator links. | | | | | | | |
| 2-3. Inverse kinematics | 2 2. Transformation of manipulator positions and orientations. | | | | | | |
| 3 Velocities and static forces | | | | | | | |
| 3–1. Linear and rotation | 3-1 Linear and rotational velocities of rigid-objects | | | | | | |
| 3-2. Velocities of manip | sities of manipulator links. | | | | | | |
| 3-3. Static forces in ma | nipulators. | | | | | | |
| | | | | | | | |
| Self Preparation and Re | view | | | | | | |
| Read the handouts befo | re the lecture. | | | | | | |
| Read the handouts befo | re the lecture. | | | | | | |
| Related subjects | | | | | | | |
| Fundamentals of linear a | s of linear algebra and mechanics. | | | | | | |
| Fundamentals of linear a | algebra and me | chanics. | | | | | |
| Notes for textbook | | | | | | | |
| Handouts will be prepar | ed. | | | | | | |
| Handouts will be prepar | ed. | | | | | | |
| Reference 1 | Book title | Introduction to Rob | otics: Mechan | ics | and Control, 3rd | ISBN | |
| | | Edition | | | | | |
| | Author | J. J. Craig | Publisher | | Prentice Hall | Publish year | 2005 |

| Reference2 | Book title | Robot Modeling and | Control | | ISBN |
|---------------------------------------|-------------------------|------------------------|-----------|--------------|-------------------|
| | Author | M. W. Spong, S. | Publisher | John Wiley & | Publish year 2006 |
| | | Hutchinson, M. | | Sons | |
| | | Vidyasagar | | | |
| Notes for reference | | | | | |
| | | | | | |
| Goals to be achieved | | | | | |
| Be able to derive kinen | natics of roboti | c manipulators. | | | |
| | | | | | |
| Be able to derive kinen | natics of roboti | c manipulators. | | | |
| Frankradian af a diama | . | | | | |
| Evaluation of achieven | ient ad aply from th | a and-of-tarm avam a | ara | | |
| Grade will be determine | ed only from th | e end-of-term exam so | core. | | |
| Examination | | | | | |
| 定期試験を実施(対面) |) | | | | |
| Examination(Face to Fa | ace) | | | | |
| Details of examination | | | | | |
| | | | | | |
| Other information | | | | | |
| Office: Room D-406, E | -mail uchiyama | @tut.jp | | | |
| Office: Room D-406, E | -mail uchiyama | @tut.jp | | | |
| | | | | | |
| Office hours | | | | | |
| Contact the lecturer by | y e-mail first. | | | | |
| Contact the lecturer by e-mail first. | | | | | |
| Relations to attainmen | t objectives of | learning and education | I | | |
| | | | | | |
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| | | | | | |
| | | | | | |
| Key words | | | | | |
| | | | | | |

(M42610020)Thesis Research on Electrical and Electronic Information Engineering[Thesis Research on Electrical and Electronic Information Engineering]

| Subject name[English] | Thesis Research on Electrical and Electronic Information Engineering[Thesis Research on | | | | | |
|------------------------------------|---|-------------------------------|-----------------------------------|----------------------|--------------------|--|
| | Electrical and Electronic Information Engineering] | | | | | |
| Schedule number | M42610020 | Subject area | Advanced | Required or | Required | |
| | | | Electrical and | elective | | |
| | | | Electronic | | | |
| | | | Engineering | | | |
| Time of starting a course | 2Years | Day of the | Intensive | Credit(s) | 6 | |
| 3 | | week,period | | | | |
| Faculty | Graduate Program | n for Master's Degre | e | Subject grade | 1~2 | |
| Department Offered | Electrical and Elec | ctronic Information | Engineering | Beggining grade | M1, M2 | |
| Charge teacher name[Roman | S2系教務委員, 2 | 2系 <mark>各教員</mark> 2kei kyor | mu <mark>Iin−S, 2kei kakuk</mark> | xyouin | | |
| alphabet mark] | | | | | | |
| Numbering | | | | | | |
| Objectives of class | | | | | | |
| The thesis research aims to prov | vide a practical exp | erience of research | n work, and to acqu | iire his/her researd | ch skill with deep | |
| understanding of the electrical an | id electronic informa | ation engineering. | | | | |
| Contents of class | | | | | | |
| The research subject depends of | n the supervisor on | d the research grou | un vou belong to F | very student will k | ave an individual | |
| research subject. For more detail | s, please contact w | ith your supervisor | up you belong to. E | | | |
| Self Preparation and Review | | , | | | | |
| | | | | | | |
| Related subjects | | | | | | |
| Notes for textbook | | | | | | |
| Reference and material will be av | ailable from the sup | ervisor. | | | | |
| Notes for reference | | | | | | |
| | | | | | | |
| Goals to be achieved | | | | | | |
| To get something new on individu | al research fields. | | | | | |
| I o develop his/her research skill | including the planni | ng and the presenta | ation. | | | |
| Evaluation of achievement | and Outcomes are | avaluated generally | | | | |
| Fresentation, mesis, Coursework, | and Outcomes are | evaluated generally | • | | | |
| その他 | | | | | | |
| None during exam period | | | | | | |
| Details of examination | | | | | | |
| | | | | | | |
| Other information | | | | | | |
| | | | | | | |
| Reference URL | | | | | | |
| Office hours | | | | | | |
| | | | | | | |
| Relations to attainment objective | s of learning and e | ducation | | | | |
| | | | | | | |
| | | | | | | |
| | | | | | | |
| | | | | | | |
| Key words | | | | | | |
| | | | | | | |

(M42610020)Thesis Research on Electrical and Electronic Information Engineering[Thesis Research on Electrical and Electronic Information Engineering]

| Subject name[English] | Thesis Research on Electrical and Electronic Information Engineering[Thesis Research on | | | | | |
|------------------------------------|---|----------------------|----------------------|---------------------|--------------------|--|
| | Electrical and Electronic Information Engineering] | | | | | |
| Schedule number | M42610020 | Subject area | Advanced | Required or | Required | |
| | | | Electrical and | elective | | |
| | | | Electronic | | | |
| | | | Engineering | | | |
| Time of starting a course | 2Years | Day of the | Intensive | Credit(s) | 6 | |
| | 2100.0 | week,period | | 010010(0) | - | |
| Faculty | Graduate Program | n for Master's Degre | e | Subject grade | 1~ | |
| Department Offered | Electrical and Ele | ctronic Information | Engineering | Beggining grade | M1, M2 | |
| Charge teacher name[Roman | S2系教務委員, 2 | 2系各教員 2kei kyor | mu Iin−S, 2kei kakuk | youin | | |
| alphabet mark] | | | | | | |
| Numbering | | | | | | |
| Objectives of class | | | | | | |
| The thesis research aims to prov | vide a practical exp | perience of research | n work, and to acqu | ire his/her researd | ch skill with deep | |
| understanding of the electrical an | d electronic inform | ation engineering. | | | | |
| | | | | | | |
| Contents of class | | | | | | |
| The research subject depends or | n the supervisor an | nd the research gro | up you belong to. E | very student will h | nave an individual | |
| research subject. For more detail | s, please contact w | ith your supervisor. | | | | |
| Sen Preparation and Review | | | | | | |
| Related subjects | | | | | | |
| Natao fau tauth cala | | | | | | |
| Reference and metavial will be av | ailable from the our | anvisor | | | | |
| Notes for reference | anable from the sup | 001 41501. | | | | |
| | | | | | | |
| Goals to be achieved | | | | | | |
| To get something new on individu | al research fields. | | | | | |
| To develop his/her research skill | including the planni | ing and the presenta | ation. | | | |
| Evaluation of achievement | | | | | | |
| Presentation, Thesis, Coursework | , and Outcomes are | e evaluated generall | у. | | | |
| Examination | | | | | | |
| その他 | | | | | | |
| None during exam period | | | | | | |
| Details of examination | | | | | | |
| Other information | | | | | | |
| Reference URL | | | | | | |
| Office hours | | | | | | |
| Deletions to attainment attain | | d | | | | |
| Relations to attainment objective | s or learning and e | ducation | | | | |
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| Key words | | | | | | |
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(M4261002T)Thesis Research on Electrical and Electronic Information Engineering[Thesis Research on Electrical and Electronic Information Engineering]

| Subject name[English] | Thesis Research on Electrical and Electronic Information Engineering[Thesis Research on | | | | | | |
|------------------------------------|---|--|----------------------|----------------------|--------------------|--|--|
| | Electrical and Elec | ctronic Information | Engineering] | | | | |
| Schedule number | M4261002T | Subject area | Advanced | Required or | Required | | |
| | | | Electrical and | elective | | | |
| | | | Electronic | | | | |
| | | | Information | | | | |
| Time of starting a course | Vear | Day of the | Intensive | Credit(c) | 6 | | |
| Time of starting a course | i cai | week period | Incensive | Orbuit(s) | 0 | | |
| Faculty | Graduate Program | n for Master's Degre | e | Subject grade | 2~ | | |
| Department Offered | Electrical and Elec | ctronic Information | Engineering | Beggining | M2 | | |
| Charge teacher name[Roman | S2系数務委員 2 | >系各教員 2kei kvor | nu lin-S. 2kei kakuk | grade | | | |
| alphabet mark] | | Jと示抉/カJ女兵, と不宜決員 ZNEI NYOINU IIITO, ZKEI KAKUKYOUIII | | | | | |
| Numbering | | | | | | | |
| Objectives of class | | | | | | | |
| The thesis research aims to prov | vide a practical exp | perience of research | work, and to acqu | ire his/her researd | ch skill with deep | | |
| understanding of the electrical an | d electronic inform | ation engineering. | | | F | | |
| | | | | | | | |
| Contents of class | | | | | | | |
| The research subject depends o | n the supervisor an | nd the research gro | up you belong to. E | ivery student will h | nave an individual | | |
| research subject. For more detail | s, please contact w | ith your supervisor. | | | | | |
| Self Preparation and Review | | | | | | | |
| | | | | | | | |
| Related subjects | | | | | | | |
| Notes for textbook | | | | | | | |
| Reference and material will be av | ailable from the sup | pervisor | | | | | |
| Notes for reference | | | | | | | |
| | | | | | | | |
| Goals to be achieved | | | | | | | |
| To get something new on individu | al research fields. | | | | | | |
| To develop his/her research skill | including the planni | ing and the presenta | ation. | | | | |
| Evaluation of achievement | | | | | | | |
| Presentation, Thesis, Coursework | , and Outcomes are | e evaluated generall | у. | | | | |
| Examination | | | | | | | |
| その他 | | | | | | | |
| None during exam period | | | | | | | |
| Dotailo UI Oxaminauon | | | | | | | |
| Other information | | | | | | | |
| | | | | | | | |
| Reference URL | | | | | | | |
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| Office hours | | | | | | | |
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| Relations to attainment objective | s of learning and e | ducation | | | | | |
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| 1 2 | | | | | | | |
| Key words | | | | | | | |
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(M42610040)Seminar on Electrical and Electronic Information Engineering[Seminar on Electrical and Electronic Information Engineering]

| Subject name[English] | Seminar on Electrical and Electronic Information Engineering[Seminar on Electrical and | | | | | | |
|-------------------------------------|--|--|---------------------|--------------------|--------------------|--|--|
| | Electronic Information Engineering | | | | | | |
| Schedule number | M42610040 | Subject area | Advanced | Required or | Required | | |
| | | | Electrical and | elective | | | |
| | | | Electronic | | | | |
| | | | Information | | | | |
| | | | Engineering | | | | |
| Time of starting a course | Year | Day of the | Intensive | Credit(s) | 6 | | |
| Faculty | Graduate Program | n for Master's Degre | e | Subject grade | 2~2 | | |
| Department Offered | Electrical and Elec | ctronic Information | Engineering | Beggining | M2 | | |
| | | | | grade | | | |
| Charge teacher name[Roman | S2系教務委員, 2 | S2系教務委員, 2系各教員 2kei kyomu lin−S, 2kei kakukyouin | | | | | |
| alphabet mark] | | | | | | | |
| Numbering | | | | | | | |
| Objectives of class | | | | | | | |
| The seminar aims to provide a b | road understanding | ; of theoretical and | experimental appro | oches related to t | he electrical and | | |
| electronic information engineering | ; for the research w | vork of his/her mast | er thesis. | | | | |
| Contents of class | | | . | | | | |
| The class provides both of fundar | nental knowledge o | n the research work | ot master thesis a | nd the most advand | ced results in the | | |
| related field by reading research | papers and monogra | apns. Contents of th | ne class depend on | the supervisor. To | be announced by | | |
| Self Preparation and Pavian | | | | | | | |
| Sell Preparation and Review | | | | | | | |
| Belated subjects | | | | | | | |
| | | | | | | | |
| Notes for textback | | | | | | | |
| Textbook or material will be made | available from the | supervisor To be a | nnounced by individ | ual supervisors | | | |
| Notes for reference | | | | | | | |
| | | | | | | | |
| Goals to be achieved | | | | | | | |
| To acquire fundamental knowledg | e on individual rese | arch fields. | | | | | |
| To acquire the ability of finding a | problem, the ability | of solving the probl | em and the present | ation skill. | | | |
| Evaluation of achievement | | | | | | | |
| Coursework, presentation and/or | report. | | | | | | |
| Examination | | | | | | | |
| その他 | | | | | | | |
| None during exam period | | | | | | | |
| Details of examination | | | | | | | |
| | | | | | | | |
| Other information | | | | | | | |
| | | | | | | | |
| Reference URL | | | | | | | |
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| Office hours | | | | | | | |
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| Relations to attainment objective | s of learning and ea | ducation | | | | | |
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| Key words | | | | | | | |
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(M42610050)Seminar on Electrical and Electronic Information Engineering 1A[Seminar on Electrical and Electronic Information Engineering 1A]

| Subject name[English] | Seminar on Electrical and Electronic Information Engineering 1A[Seminar on Electrical and | | | | |
|-------------------------------------|---|----------------------|----------------------|--------------------|--------------------|
| | Electronic Inform | ation Engineering 1 | 0 L | | |
| Schedule number | M42610050 | Subject area | Advanced | Required or | Required |
| | | - | Electrical and | elective | |
| | | | Electronic | | |
| | | | Information | | |
| | | | Engineering | | |
| Time of starting a course | Year | Day of the | Intensive | Credit(s) | 4 |
| . . | | week,period | | | |
| Faculty | Graduate Program | tor Master's Degre | | Subject grade | 1~ |
| Department Offered | Electrical and Elec | ctronic information | Engineering | Beggining grade | IVI I, IVIZ |
| Charge teacher name[Roman | S2系教務委員 2 | ·系各教員 2kei kvor | mu lin−S. 2kei kakuk | svouin | |
| alphabet mark] | | | | ., • • • • • • | |
| Numbering | | | | | |
| Objectives of class | | | | | |
| The seminar aims to provide a h | road understanding | of theoretical and | experimental appro | oches related to t | he electrical and |
| electronic information engineering | g for the research w | ork of his/her mast | er thesis. | | |
| Contents of class | | , | | | |
| The class provides both of funda | mental knowledge o | n the research work | of master thesis a | nd the most advan | ced results in the |
| related field by reading research | papers and monogra | aphs. Contents of th | ne class depend on | the supervisor. To | be announced by |
| individual supervisors. | | | | | |
| Self Preparation and Review | | | | | |
| | | | | | |
| Related subjects | | | | | |
| - | | | | | |
| Notes for textbook | | | | | |
| Textbook or material will be made | available from the | supervisor. To be a | nnounced by individ | ual supervisors. | |
| Notes for reference | | | | | |
| | | | | | |
| Goals to be achieved | | | | | |
| To acquire fundamental knowledg | e on individual rese | arch fields. | | | |
| To acquire the ability of finding a | problem, the ability | of solving the prob | em and the present | ation skill. | |
| Evaluation of achievement | | | | | |
| Coursework, presentation and/or | report. | | | | |
| Examination | • | | | | |
| その他 | | | | | |
| None during exam period | | | | | |
| Details of examination | | | | | |
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| Other information | | | | | |
| | | | | | |
| Reference URL | | | | | |
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| Office hours | | | | | |
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| Relations to attainment objective | s of learning and e | ducation | | | |
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| Key words | | | | | |
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(M42630100)Methodology of R & D 1[Methodology of R & D 1]

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|------------------------------------|----------------------|----------------|--------|---------------------|---------------------|--------------------|--|
| Subject name[English] | Methodology of R | & D 1[Metho | dology | of R & D 1 | | | |
| Schedule number | M42630100 | Subject are | a | Advanced | Required or | Elective | |
| | | | | Electrical and | elective | | |
| | | | | Electronic | | | |
| | | | | Information | | | |
| | | | | Engineering | | | |
| Time of starting a course | Fall term | Day of | the | Tue.3~3 | Credit(s) | 2 | |
| - | | week.period | | | . • | | |
| Faculty | Graduate Program | n for Master's | Degre | e | Subject grade | 1~ | |
| Department Offered | Electrical and Ele | ctronic Inform | ation | Engineering | Beggining | M1. M2 | |
| | | | | | | | |
| Charge teacher name[Roman | S2系数務委員 2 | kei kvomu lin- | S | | 8.000 | | |
| alphabet mark] | | | 0 | | | | |
| Numbering | | | | | | | |
| Rumbering | | | | | | | |
| Objectives of class | | | | | | | |
| The class aims to provide a ba | sic understanding | of R&D metho | odolog | y related to the e | lectrical and elect | ronic information | |
| engineering for the research work | of his/her master | thesis. | | | | | |
| The class aims to provide a ba | sic understanding | of R&D metho | odolog | y related to the e | lectrical and elect | ronic information | |
| engineering for the research work | of his/her master | thesis. | | | | | |
| Contents of class | | | | | | | |
| The class provides some fundam | ental tips to condu | ict R&D work | effect | ively. Contents of | he class depend o | n the supervisor | |
| To be appounced by individual su | nervisors | | | | | | |
| The class provides some fundament | ental tins to condu | ict R&D work | offort | ively Contents of t | he class depend o | n the supervisor | |
| To be appounced by individual an | nervisors | OC NOD WORK | SHECL | avory. Contents Of | | in the supervisor. | |
| Solf Properation and Poview | pervisors | | | | | | |
| Ser Preparation and Review | | | | | | | |
| | | | | | | | |
| Related subjects | | | | | | | |
| | | | | | | | |
| Notes for textbook | | | | | | | |
| Reference and material will be av | ailable from the sur | envisor | | | | | |
| Reference and material will be ave | ailable from the sup | ervisor. | | | | | |
| Neteo for reference | | | | | | | |
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| | | | | | | | |
| Goals to be achieved | | | | | | | |
| To acquire the ability of identif | ying and formulatir | ng research p | robler | n, planning and imp | elementing specific | research tasks, | |
| troubleshooting and communicati | ng outcomes. | | | | | | |
| To acquire the ability of identif | ying and formulatir | ng research p | robler | n, planning and imp | elementing specific | research tasks, | |
| troubleshooting and communicati | ng outcomes. | | | | | | |
| Evaluation of achievement | | | | | | | |
| Coursework and presentation are | evaluated generally | y . | | | | | |
| | <u> </u> | | | | | | |
| Coursework and procentation | avaluated generally | , | | | | | |
| Goursework and presentation are | evaluated generally | y. | | | | | |
| | | | | | | | |
| Examination | | | | | | | |
| 試験期間中には何も行わない | | | | | | | |
| None during exam period | | | | | | | |
| Details of examination | | | | | | | |
| | | | | | | | |
| Other information | | | | | | | |
| | | | | | | | |
| | | | | | | | |
| Reference URL | | | | | | | |
| | | | | | | | |
| Office hours | | | | | | | |
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| relations to attainment objective | s of learning and e | ducation | | | | | |
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| | | | | | | | |

Key words

(M42630130)Material Science for Electronics 2[Material Science for Electronics 2]

| Subject name[English] | Material Science f | Material Science for Electronics 2[Material Science for Electronics 2] | | | | | |
|---------------------------|---------------------|--|----------------|-----------------|-----------------|--|--|
| Schedule number | M42630130 | Subject area | Advanced | Required or | Elective | | |
| | | | Electrical and | elective | | | |
| | | | Electronic | | | | |
| | | | Information | | | | |
| | | | Engineering | | | | |
| Time of starting a course | Fall term | Day of the | Mon.5~5 | Credit(s) | 2 | | |
| | | week,period | | | | | |
| Faculty | Graduate Program | n for Master's Degre | e | Subject grade | 1~ | | |
| Department Offered | Electrical and Elec | ctronic Information | Engineering | Beggining | M1, M2 | | |
| | | | | grade | | | |
| Charge teacher name[Roman | 福田 光男,中村 | 村 雄一,武藤 浩; | 行,未定 FUKUDA | Mitsuo, NAKAMUR | RA Yuichi, MUTO | | |
| alphabet mark] | Hiroyuki, To be as | ssigned | | | | | |
| Numbering | | | | | | | |

Objectives of class

Objective of this subject is to learn about the forefront research and development on thermoelectronics and photonics in electronic materials, and and powder processing.

Objective of this subject is to learn about the forefront research and development on thermoelectronics and photonics in electronic materials, and and powder processing.

Contents of class

1. Thermoelectronics.

You will learn about advanced thermoelectronic materials and area from fundamentals to applications of thermoelectronics. 1) thermoelectronic materials, 2) Applications and processing of thermoelectronic materials, 3) Thermoelectronic devices and systems.

2. Photonics.

You will learn about photonic materials and devices.

1) photonic matreials and 2) (nano-) photonic devices.

3. Powder processing technologies

You will learn about powder processing techniques for electronic devices.

1) sintering, 2) micrstructute of ceramics and 3) nanocomposite

1. Thermoelectronics.

You will learn about advanced thermoelectronic materials and area from fundamentals to applications of thermoelectronics. 1) thermoelectronic materials, 2) Applications and processing of thermoelectronic materials, 3) Thermoelectronic devices and systems.

2. Photonics.

You will learn about photonic materials and devices.

1) photonic matreials and 2) (nano-) photonic devices.

3. Powder processing technologies

You will learn about powder processing techniques for electronic devices.

1) sintering, 2) micrstructute of ceramics and 3) nanocomposite

Self Preparation and Review

Related subjects

Notes for textbook

Lecture materials will be distributed.

Lecture materials will be distributed.

Notes for reference

Goals to be achieved

It aims at acquiring the broad knowledge of research and development by learning about the bases of recent research and

| development in various fields. |
|---|
| It aims at acquiring the broad knowledge of research and development by learning about the bases of recent research and |
| development in various fields. |
| Evaluation of achievement |
| The reports or tests will be set in each categories. |
| The result is evaluated from the sum of those marks. |
| Grades: A:80–100, B:65–79, C:55–64. |
| The reports or tests will be set in each categories. |
| The result is evaluated from the sum of those marks. |
| Grades: A:80-100, B:65-79, C:55-64. |
| Examination |
| レポートで実施 |
| By Report |
| Details of examination |
| |
| Other information |
| |
| Reference URL |
| |
| Office hours |
| Please make an appointment via e−mail. |
| Please make an appointment via e−mail. |
| Relations to attainment objectives of learning and education |
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| Key words |
| photonics, thermelectronics, and powder processing. |
| photonics, thermelectronics, and powder processing. |

(M42630170)Electrical Energy Systems 2[Electrical Energy Systems 2]

| Subject name[English] | Electrical Energy | Electrical Energy Systems 2[Electrical Energy Systems 2] | | | | | |
|---|-----------------------|--|----------------------|----------------------|--------------------|--|--|
| Schedule number | M42630170 | Subject area | Advanced | Required or | Elective | | |
| | | | Electrical and | elective | | | |
| | | | Electronic | | | | |
| | | | Information | | | | |
| | | | Engineering | | | | |
| Time of starting a course | Fall term | Day of the | Mon.4~4 | Credit(s) | 2 | | |
| | | week,period | | | | | |
| Faculty | Graduate Program | n for Master's Degre | e | Subject grade | 1~ | | |
| Department Offered | Electrical and Elec | ctronic Information | Engineering | Beggining | M1, M2 | | |
| | | | | grade | | | |
| Charge teacher name[Roman alphabet mark] | 滝川 浩史,櫻井 | 庸司,穂積 直裕□ | FAKIKAWA Hirofumi | , SAKURAI Yoji, HO | ZUMI Naohiro | | |
| Numbering | | | | | | | |
| | | | | | | | |
| Objectives of class | | | | | | | |
| This lecture is implemented as a | n introduction to ele | ectrical energy syst | ems. In order to uti | lize electric energy | in various fields, | | |

lectrues on the generation, transmission, distribution and control of electric energy, high voltage engineering, secondary batteries, discharge plasma are given. It is being useful as reference and self-study guide for the professional dealing with this important area. There are three sub courses to choose from.

This lecture is implemented as an introduction to electrical energy systems. In order to utilize electric energy in various fields, lectrues on the generation, transmission, distribution and control of electric energy, high voltage engineering, secondary batteries, discharge plasma are given. It is being useful as reference and self-study guide for the professional dealing with this important area. There are three sub courses to choose from.

Contents of class

Sub Course 1

- 1. Phenomena of ionized gas
- 2. Characteristics of discharge plasma
- 3. Recent trend in plasma applications
- Sub Course 2
- 1. Lithium-ion Batteries
- 2. Post Lithium-ion Batteries
- 3. Recent Trend in Electrochemical Energy Storage Devices
- Sub Course 3
- 1. Energy propagation thorough distributed medium.
- 2. Diagnosing techniques for industrial and biomedical matters.
- 3. Assessment for high voltage insulation system for power use.
- Sub Course 1
- 1. Phenomena of ionized gas
- 2. Characteristics of discharge plasma
- 3. Recent trend in plasma applications
- Sub Course 2
- 1. Lithium-ion Batteries
- 2. Post Lithium-ion Batteries
- 3. Recent Trend in Electrochemical Energy Storage Devices Sub Course 3
- Sub Course 3
- 1. Energy propagation thorough distributed medium.
- 2. Diagnosing techniques for industrial and biomedical matters.
- 3. Assessment for high voltage insulation system for power use.

Self Preparation and Review

Related subjects

Electric Power Systems, Dielectrics and Electrical Insulation, Energy Conversion, Plasma Science Electric Power Systems, Dielectrics and Electrical Insulation, Energy Conversion, Plasma Science

Notes for textbook

Materials will be prepared by the lecturer.

Materials will be prepared by the lecturer.

Notes for reference

Goals to be achieved

To understand the basic knowledge of electric enrgy systems and related fields. To understand the basic knowledge of electric enrgy systems and related fields.

Evaluation of achievement

Marks are based on the final examination or report (100%). Marks are based on the final examination or report (100%).

Examination

定期試験を実施(対面)

Examination(Face to Face)
Details of examination

Other information

Office: C-311, TEL: 0532-44-6727, E-mail: takikawa@ee.tut.jp Office: C-311, TEL: 0532-44-6727, E-mail: takikawa@ee.tut.jp **Reference URL**

Office hours

Before and/or after the lecture and at any time after making the appointment based on e-mail. Before and/or after the lecture and at any time after making the appointment based on e-mail. **Relations to attainment objectives of learning and education**

Key words

Electric Energy, Electric Power, High Voltage, Secondary Battery, Plasma, Electrical Insulation Electric Energy, Electric Power, High Voltage, Secondary Battery, Plasma, Electrical Insulation

(M42630210)Semiconductor Physics 2[Semiconductor Physics 2]

| Subject name[English] | Semiconductor Pl | hysics 2[Semicondue | ctor Physics 2] | | | | |
|---------------------------|--|-----------------------|-----------------|---------------|--------|--|--|
| Schedule number | M42630210 | Subject area | Required or | Elective | | | |
| | | | Electrical and | elective | | | |
| | | | Electronic | | | | |
| | | | Information | | | | |
| | | | Engineering | | | | |
| Time of starting a course | Fall term | Day of the | Tue.1~1 | Credit(s) | 2 | | |
| | | week,period | | | | | |
| Faculty | Graduate Program | n for Master's Degre | e | Subject grade | 1~ | | |
| Department Offered | Electrical and Elec | ctronic Information I | Engineering | Beggining | M1, M2 | | |
| | grade | | | | | | |
| Charge teacher name[Roman | 若原 昭浩, 岡田 浩, 河野 剛士 WAKAHARA Akihiro, OKADA Hiroshi, KAWANO Takeshi | | | | | | |
| alphabet mark] | | | | | | | |
| Numbering | | | | | | | |

Objectives of class

To understand semiconductor physics, structure, design, and processing of advanced semiconductor devices. To understand semiconductor physics, structure, design, and processing of advanced semiconductor devices.

Contents of class

This subject consists of two parts. The first half begins by introducing majority- and minority-carrier behavior in fundamental pn-junction and MOS structures. Injected minority carrier dynamics in semiconductors is also included. On the latter half, student choose one from following two topics.

1. Fabrication and characterization technology for Nanosturecture devices (Prof. Okada)

2. Band engineering and quantum effect devices (Prof. Wakahara)

3. Advanced MEMS/NEMS technologies(Prof. Kawano)

Adding to lectures by professors, in this subject, a case study is also conducted. Namely, students are required to give a presentation on researches on the given topics, and on design of devices that satisfies required specifications.

This subject consists of two parts. The first half begins by introducing majority- and minority-carrier behavior in fundamental pn-junction and MOS structures. Injected minority carrier dynamics in semiconductors is also included. On the latter half, student choose one from following two topics.

1. Fabrication and characterization technology for Nanosturecture devices (Prof. Okada)

2. Band engineering and quantum effect devices (Prof. Wakahara)

3. Advanced MEMS/NEMS technologies(Prof. Kawano)

Adding to lectures by professors, in this subject, a case study is also conducted. Namely, students are required to give a presentation on researches on the given topics, and on design of devices that satisfies required specifications.

Self Preparation and Review

Related subjects

Notes for textbook

S.M.Sze, Physics of Semiconductor Devices (Wiley)

Related references, data, printed matters will be given in the class. S.M.Sze, Physics of Semiconductor Devices (Wiley)

Related references, data, printed matters will be given in the class. Notes for reference

Goals to be achieved

You will be able to:

- 1. Deeply understand fundamental phenomena in semiconductors, and explain operation principle of basic semiconductor devices to master course students.
- 2. Design a essential part of semiconductor devcie that satisfies the given specification.
- 3. Investigate on given topics, and give a lecture on this.

You will be able to:

- 1. Deeply understand fundamental phenomena in semiconductors, and explain operation principle of basic semiconductor devices to master course students.
- 2. Design a essential part of semiconductor devcie that satisfies the given specification.
- 3. Investigate on given topics, and give a lecture on this.

Evaluation of achievement

Achievenemt of lectures of the case study, and writing research reports.

Achievenemt of lectures of the case study, and writing research reports.

Examination

レポートで実施

By Report

Details of examination

Other information

Before choosing a sub-course, contact to following professors

Akihiro Wakahara:C-608 wakahara[at]ee.tut.ac.jp Hiroshi Okada:C-303B okada[at]ee.tut.ac.jp Takeshi Kawano:C-603 kawano[at]ee.tut.ac.jp

Before choosing a sub-course, contact to following professors

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Reference URL

http://www.int.ee.tut.ac.jp http://www.eiiris.tut.ac.jp http://www.int.ee.tut.ac.jp http://www.eiiris.tut.ac.jp

Office hours

Relations to attainment objectives of learning and education

Key words

Solid-state electronics, semiconductor physics, laser diode, low-dimensional quantum devices Solid-state electronics, semiconductor physics, laser diode, low-dimensional quantum devices

(M42630270)Advanced Electronic Information System 2[Advanced Electronic Information System 2]

| Subject name[English] | Advanced Electro | nic Information Sys | tem 2[Advanced Ele | ectronic Information | n System 2] | | |
|---------------------------|--|-------------------------------------|--------------------|----------------------|-------------|--|--|
| Schedule number | M42630270 | Subject area | Advanced | Required or | Elective | | |
| | | | Electrical and | elective | | | |
| | | | Electronic | | | | |
| | | | Information | | | | |
| | | | Engineering | | | | |
| Time of starting a course | Fall term | Fall term Day of the Mon.1~1 | | Credit(s) | 2 | | |
| | | week,period | | | | | |
| Faculty | Graduate Program | n for Master's Degre | ee | Subject grade | 1~ | | |
| Department Offered | Electrical and Elec | ctronic Information | Engineering | Beggining | M1, M2 | | |
| | | | | grade | | | |
| Charge teacher name[Roman | 市川 周一, 田村 昌也 ICHIKAWA Shuichi, TAMURA Masaya | | | | | | |
| alphabet mark] | | | | | | | |
| Numbering | | | | | | | |

Objectives of class

The aims of this lecture:

(1) To understand various topics on logic design and computer aided design (CAD),

(2) To understand the role and design of microwave filter used in wireless communications.

The aims of this lecture:

(1) To understand various topics on logic design and computer aided design (CAD),

(2) To understand the role and design of microwave filter used in wireless communications.

Contents of class

This lecture consists of two themes shown below.

(1) As a result of recent progresses in VLSI technology, the complexity of digital circuit has rapidly increased in these years. Computer-aided design (CAD) is now essential to design logic circuit. This lecture introduces various CAD tools and the algorithms for CAD.

Week 1: LSI design and CAD Week 2: Logic synthesis Week 3: Layout Week 4: Timing analysis Week 5: Logic simulation Week 6: Verification Week 7: Test Week 8: Examination

(2) The aim of this course is to acquire the knowledge and design techniques of microwave filter used in wireless communications.

- 1. Slope Parameter and Q factor
- 2. Coupling coefficient
- 3. Stepped Impedance resonator
- 4. Hybrid resonator
- 5. Design of unbalanced-unbalanced filter
- 6. Design of unbalanced-balanced filter (1)
- 7. Design of unbalanced-balanced filter (2)
- 8. Examination

This lecture consists of two themes shown below.

(1) As a result of recent progresses in VLSI technology, the complexity of digital circuit has rapidly increased in these years. Computer-aided design (CAD) is now essential to design logic circuit. This lecture introduces various CAD tools and the

algorithms for CAD.

Week 1: LSI design and CAD Week 2: Logic synthesis Week 3: Layout Week 4: Timing analysis Week 5: Logic simulation Week 6: Verification Week 7: Test Week 8: Examination

(2) The aim of this course is to acquire the knowledge and design techniques of microwave filter used in wireless communications.

1. Slope Parameter and Q factor

2. Coupling coefficient

3. Stepped Impedance resonator

4. Hybrid resonator

5. Design of unbalanced-unbalanced filter

6. Design of unbalanced-balanced filter (1)

7. Design of unbalanced-balanced filter (2)

8. Examination

Self Preparation and Review

Related subjects

Prerequisite (1): Fundamental knowledge and skills of logic design, algorithms, and computer structure.

Prerequisite (2): Fundamental Knowledge and skills of high-frequency circuit and electromagnetic engineering

Prerequisite (1): Fundamental knowledge and skills of logic design, algorithms, and computer structure.

Prerequisite (2): Fundamental Knowledge and skills of high-frequency circuit and electromagnetic engineering

Notes for textbook

No textbooks are assigned. No textbooks are assigned.

Notes for reference

Goals to be achieved

(1) To understand various CAD tools and the algorithms for CAD,

(2) To understand the role and design of microwave filter used in wireless communications.

(1) To understand various CAD tools and the algorithms for CAD,

(2) To understand the role and design of microwave filter used in wireless communications.

Evaluation of achievement

Item (1) 50%, Item (2) 50%. Item (1) 50%, Item (2) 50%.

Examination

定期試験を実施(対面)

Examination(Face to Face)

Details of examination

TBD TBD

Other information

Shuichi Ichikawa, Room C-404, ext. 6897, E-mail: ichikawa@tut.jp
 Masaya Tamura, Room C-405, ext. 6754, E-mail: tamura@ee.tut.ac.jp

(1) Shuichi Ichikawa, Room C-404, ext. 6897, E-mail: ichikawa@tut.jp

(2) Masaya Tamura, Room C-405, ext. 6754, E-mail: tamura@ee.tut.ac.jp

Reference URL

http://www.ccs.ee.tut.ac.jp/~ichikawa/lecture/

http://www.comm.ee.tut.ac.jp/em/index_en.html http://www.ccs.ee.tut.ac.jp/~ichikawa/lecture/ http://www.comm.ee.tut.ac.jp/em/index_en.html

Office hours

Please make an appointment for consultation with the lecturer via e-mail or direct communication in classroom. Please make an appointment for consultation with the lecturer via e-mail or direct communication in classroom.

Relations to attainment objectives of learning and education

Key words

(1) Logic design, algorithm (2) Analog filter, microwave filter, high-frequency circuit design, distributed constant circuit, Electromagnetic Engineering

(1) Logic design, algorithm (2) Analog filter, microwave filter, high-frequency circuit design, distributed constant circuit, Electromagnetic Engineering

(M43610010)Seminar on Computer Science and Engineering I[Seminar on Computer Science and Engineering I]

| Subject name[English] | C | | | · · · · · · · · · · · · · · · · · · · | L. O' | | | | | | |
|--|---|---|--|---------------------------------------|----------------------------|--|--|--|--|--|--|
| | Seminar on Co | eminar on Compu | ter Science and | | | | | | | | |
| | Engineering I | | | | | | | | | | |
| Schedule number | M43610010 | Subject area | Advanced | Required or | Required | | | | | | |
| | | | Computer | elective | | | | | | | |
| | | | Science and | | | | | | | | |
| | | | Engineering | | | | | | | | |
| Time of starting a course | Year | Day of the | Intensive | Credit(s) | 4 | | | | | | |
| | | week,period | | | | | | | | | |
| Faculty | Graduate Progra | m for Master's Degr | ee | Subject grade | 1~ | | | | | | |
| Department Offered | Computer Scien | ce and Engineering | | Beggining | M1, M2 | | | | | | |
| - | | | | grade | | | | | | | |
| Charge teacher name[Roman | S3系教務委員, | 3系各教員 3kei kyo | mu Iin-S, 3kei kakuł | kyouin | l. | | | | | | |
| alphabet mark] | | - | | - | | | | | | | |
| Numbering | | | | | | | | | | | |
| | | | | | | | | | | | |
| Objectives of class | | | | | | | | | | | |
| The course is intended for stud | lents to study ba | asic materials in de _l | oth, related to his/ | her research subj | ects in computer | | | | | | |
| science and engineering. | | | | | | | | | | | |
| It is also aimed for students to a | acquire various sk | tills, required in gene | ral research work, s | such as those for | oral presentation, | | | | | | |
| and technical discussion and writ | ing. | | | | | | | | | | |
| | | | | | | | | | | | |
| Contents of class | | | | | | | | | | | |
| While specific contents depend | on the research | areas students are i | nvolved in it is us | ually the case for | students to read | | | | | | |
| relevant textbooks/research paper | ers and report on | them as well as to n | resent and discuss | on the research wo | ork of their own | | | | | | |
| Self Preparation and Review | | | | on the research we | | | | | | | |
| Consult with your advisor | | | | | | | | | | | |
| Consult with your advisor. | | | | | | | | | | | |
| Related subjects | | | | | | | | | | | |
| Consult with your advisor. | | | | | | | | | | | |
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| | | | | | | | | | | | |
| Notes for textbook | | | | | | | | | | | |
| | | | | | | | | | | | |
| Notes for reference | | | | | Consult with your advisor. | | | | | | |
| Notes for reference | | | | | | | | | | | |
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| Goals to be achieved | | | | | | | | | | | |
| Goals to be achieved To acquire abilities for technical | readings in English | n, logical thinking∕exp | lanation, and clear p | presentation. | | | | | | | |
| Goals to be achieved To acquire abilities for technical Evaluation of achievement | readings in English | ı, logical thinking/exp | lanation, and clear p | presentation. | | | | | | | |
| Goals to be achieved To acquire abilities for technical Evaluation of achievement Will be evaluated by taking into | readings in English accout various fa | ı, logical thinking/exp ctors overall, such a | lanation, and clear p s technical explana | presentation. tion, question ansv | vering, discussion | | | | | | |
| Goals to be achieved To acquire abilities for technical f Evaluation of achievement Will be evaluated by taking into involvements and so on. | readings in English accout various fa | ı, logical thinking/exp ctors overall, such a | lanation, and clear p s technical explana | presentation. tion, question answ | vering, discussion | | | | | | |
| Goals to be achieved To acquire abilities for technical Evaluation of achievement Will be evaluated by taking into involvements and so on. Examination | readings in English accout various fa | ı, logical thinking/exp ctors overall, such a | lanation, and clear p s technical explana | presentation. tion, question ansv | vering, discussion | | | | | | |
| Goals to be achieved To acquire abilities for technical Evaluation of achievement Will be evaluated by taking into involvements and so on. Examination その他 | readings in English accout various fa | ı, logical thinking/exp ctors overall, such a | lanation, and clear p s technical explana | presentation. tion, question answ | vering, discussion | | | | | | |
| Goals to be achieved To acquire abilities for technical in Evaluation of achievement Will be evaluated by taking into involvements and so on. Examination その他 | readings in English accout various fa | ı, logical thinking/exp ctors overall, such a | lanation, and clear p s technical explana | presentation. tion, question ansv | vering, discussion | | | | | | |
| Goals to be achieved To acquire abilities for technical in Evaluation of achievement Will be evaluated by taking into involvements and so on. Examination その他 None during exam period Datalia of avamination | readings in English accout various fa | ı, logical thinking/exp ctors overall, such a | lanation, and clear p s technical explana | presentation. tion, question ansv | vering, discussion | | | | | | |
| Goals to be achieved To acquire abilities for technical i Evaluation of achievement Will be evaluated by taking into involvements and so on. Examination その他 None during exam period Details of examination | readings in English accout various fa | ı, logical thinking/exp ctors overall, such a | lanation, and clear p s technical explana | presentation. tion, question ansv | vering, discussion | | | | | | |
| Goals to be achieved To acquire abilities for technical i Evaluation of achievement Will be evaluated by taking into involvements and so on. Examination その他 None during exam period Details of examination | readings in English accout various fa | ı, logical thinking/exp ctors overall, such a | lanation, and clear p s technical explana | presentation. tion, question ansv | vering, discussion | | | | | | |
| Goals to be achieved To acquire abilities for technical Evaluation of achievement Will be evaluated by taking into involvements and so on. Examination その他 None during exam period Details of examination Other information | readings in English accout various fa | ı, logical thinking/exp ctors overall, such a | lanation, and clear p s technical explana | presentation. tion, question ansv | vering, discussion | | | | | | |
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| Goals to be achieved To acquire abilities for technical i Evaluation of achievement Will be evaluated by taking into involvements and so on. Examination その他 None during exam period Details of examination Other information Reference URL | readings in English accout various fa | ı, logical thinking/exp ctors overall, such a | lanation, and clear p s technical explana | presentation. tion, question ansv | vering, discussion | | | | | | |
| Goals to be achieved To acquire abilities for technical Evaluation of achievement Will be evaluated by taking into involvements and so on. Examination その他 None during exam period Details of examination Other information Reference URL | readings in English accout various fa | ı, logical thinking/exp ctors overall, such a | lanation, and clear p s technical explana | presentation. tion, question ansv | vering, discussion | | | | | | |
| Goals to be achieved To acquire abilities for technical Evaluation of achievement Will be evaluated by taking into involvements and so on. Examination その他 None during exam period Details of examination Other information Reference URL | readings in English accout various fa | ı, logical thinking/exp ctors overall, such a | lanation, and clear p s technical explana | presentation. tion, question answ | vering, discussion | | | | | | |
| Goals to be achieved To acquire abilities for technical Evaluation of achievement Will be evaluated by taking into involvements and so on. Examination その他 None during exam period Details of examination Other information Reference URL Office hours | readings in English accout various fa | ı, logical thinking/exp ctors overall, such a | lanation, and clear p s technical explana | presentation. tion, question answ | vering, discussion | | | | | | |
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| Goals to be achieved To acquire abilities for technical Evaluation of achievement Will be evaluated by taking into involvements and so on. Examination その他 None during exam period Details of examination Other information Reference URL Office hours Relations to attainment objective | readings in English accout various fa accout sarious fa | ı, logical thinking/exp ctors overall, such a | lanation, and clear p s technical explana | presentation. tion, question answ | vering, discussion | | | | | | |
| Goals to be achieved To acquire abilities for technical Evaluation of achievement Will be evaluated by taking into involvements and so on. Examination その他 None during exam period Details of examination Other information Reference URL Office hours Relations to attainment objective | readings in English accout various fa accout services of learning and | i, logical thinking/exp ctors overall, such a | lanation, and clear p s technical explana | presentation. tion, question answ | vering, discussion | | | | | | |
| Goals to be achieved To acquire abilities for technical Evaluation of achievement Will be evaluated by taking into involvements and so on. Examination その他 None during exam period Details of examination Other information Reference URL Office hours Relations to attainment objective | readings in English accout various fa accout various fa | i, logical thinking/exp ctors overall, such a | lanation, and clear p s technical explana | presentation. tion, question answ | vering, discussion | | | | | | |
| Goals to be achieved To acquire abilities for technical Evaluation of achievement Will be evaluated by taking into involvements and so on. Examination その他 None during exam period Details of examination Other information Reference URL Office hours Relations to attainment objective | readings in English accout various fa accout various fa | , logical thinking/exp ctors overall, such a education | lanation, and clear p s technical explana | presentation. tion, question answ | vering, discussion | | | | | | |
| Goals to be achieved To acquire abilities for technical Evaluation of achievement Will be evaluated by taking into involvements and so on. Examination その他 None during exam period Details of examination Other information Reference URL Office hours Relations to attainment objective | readings in English accout various fa | i, logical thinking/exp ctors overall, such a | lanation, and clear p s technical explana | presentation. tion, question answ | vering, discussion | | | | | | |
| Goals to be achieved To acquire abilities for technical Evaluation of achievement Will be evaluated by taking into involvements and so on. Examination その他 None during exam period Details of examination Other information Reference URL Office hours Relations to attainment objective | readings in English accout various fa | i, logical thinking/exp ctors overall, such a | lanation, and clear p s technical explana | presentation. tion, question answ | vering, discussion | | | | | | |
| Goals to be achieved To acquire abilities for technical Evaluation of achievement Will be evaluated by taking into involvements and so on. Examination その他 None during exam period Details of examination Other information Reference URL Office hours Relations to attainment objective | readings in English accout various fa | i, logical thinking/exp ctors overall, such a education | lanation, and clear p s technical explana | presentation. tion, question answ | vering, discussion | | | | | | |

(M43610020)Seminar on Computer Science and Engineering II[Seminar on Computer Science and Engineering II]

| Subject name[Endich] | (intertorozo conductor compared control and Engineering all c | | | | | | | |
|--------------------------------------|--|-------------|-------------|---------------------|---------------------------------|----------------|----------|--------------------|
| Subject name[EngliSh] | Seminar on Computer Science and Engineering II | | | a Engineering IILSe | Seminar on Computer Science and | | | |
| Cabadula art | | 0.1 | . | _ | A du care! | December 1 | | Dominal |
| Schedule number | M43610020 | Subjec | t area | a | Advanced | Required or | | Required |
| | | | | Computer | elective | | | |
| | | | Science and | | | | | |
| | | - | | - | Engineering | | | - |
| Time of starting a course | Year | Day | of | the | Intensive | Credit(s) | | 2 |
| | | week,p | eriod | | | | | |
| Faculty | Graduate Prograr | n for Mas | ster's | Degre | e | Subject gra | de | 2~ |
| Department Offered | Computer Scienc | e and En | ginee | ring | | Beggining | | M2 |
| - | | | _ | | | grade | | |
| Charge teacher name[Roman _ | S3系教務委員, (| 3糸各教員 | 員 3ke | ei kyor | nu Iin−S, 3kei kakuk | youin | | |
| alphabet mark] | | | | | | | | |
| Numbering | | | | | | | | |
| Objectives of class | | | | | | | | |
| The course is intended for stud | lents to study bas | sic mater | rials i | n dep | th. related to his/ | her research | subie | ects in computer |
| science and engineering. | | | | | | | 5 | · |
| It is also aimed for students to a | acquire various skil | lls, requir | ed in | gene | al research work | such as those | for | oral presentation |
| and technical discussion and writi | ing. | , . | | 01.0 | | | | , |
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| Contents of class | | | | | | | | |
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| wrille specific contents depend | on the research a | reas stud | ients | are ir | ivoivea in, it is usu | ally the case | tor | students to read |
| relevant textbooks/research pape | ers and report on t | nem, as w | vell as | s to pr | esent and discuss of | on the resear | ch wo | rk of their own. |
| Self Preparation and Review | | | | | | | | |
| Consult with your advisor. | | | | | | | | |
| Related subjects | | | | | | | | |
| Consult with your advisor. | | | | | | | | |
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| Notes for textbook | | | | | | | | |
| Consult with your advisor | | | | | | | | |
| Notes for reference | | | | | | | | |
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| Goals to be achieved | | | | , . | | | | |
| To acquire abilities for technical r | readings in English, | logical th | hinkin | g/expl | anation, and clear p | resentation. | | |
| Evaluation of achievement | | | | | | | | |
| Will be evaluated by taking into a | accout various fac | tors over | rall, s | uch as | s technical explanat | tion, question | ansv | vering, discussion |
| involvements and so on. | | | | | | | | |
| Examination | | | | | | | | |
| その他 | | | | | | | | |
| None during exam period | | | | | | | | |
| Details of examination | | | | | | | | |
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| Other information | | | | | | | | |
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| Reference I IPI | | | | | | | | |
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| Office hours | | | | | | | | |
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| Relations to attainment objective | s of learning and e | ducation | | | | | | |
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(M43610030)Thesis Research on Computer Science and Engineering[Thesis Research on Computer Science and Engineering]

| Subject name[English] | Thesis Research on Computer Science and Engineering[Thesis Research on Computer | | | | | | |
|--|---|---------------------------|--|-------------------------|------------------|--|--|
| | Science and Engir | neering] | | | | | |
| Schedule number | M43610030 | Subject area | Advanced Computer Science and Engineering | Required or elective | Required | | |
| Time of starting a course | 2Years | Day of the week,period | Intensive | Credit(s) | 6 | | |
| Faculty | Graduate Program | n for Master's Degre | ee | Subject grade | 1~2 | | |
| Department Offered | Computer Science | e and Engineering | | Beggining grade | M1, M2 | | |
| Charge teacher name[Roman alphabet mark] | S3系教務委員, 3 | 3系各教員 3kei kyoi | mu Iin−S, 3kei kakuk | xyouin | | | |
| Numbering | | | | | | | |
| Objectives of class The course is intended for students to foster their interests in research problems on computer science and engineering and to acquire ability for independent studies. It is also aimed for students to acquire, through thesis research, cooperativeness, a sense of responsibility, abilities for problem solving, research planning, decision making, outcome presentation and subject investigation, and to enhance their creativity and persistency, among others. | | | | | | | |
| Contents of class It is usually the case that thesis another. | research is carried | out on individual ba | ses with specific co | ntents differing fro | m one student to | | |
| Consult with your advisor for any | further details. | | | | | | |

Self Preparation and Review

Related subjects

Consult with your advisor for them.

Notes for textbook

Consult with your advisor for them.

Notes for reference

Goals to be achieved

To acquire abilities for doing research and development at technically high level, sophisticated decision making, and leading large scale research projects.

Evaluation of achievement

Three faculty members will be assigned to prepare the evaluation for your thesis research, based on publication records, master thesis, and oral presentation. It will be then finalized by the faculty meeting.

Examination

その他

None during exam period

Details of examination

Other information

Reference URL

Office hours

Relations to attainment objectives of learning and education

Key words

(M43610030)Thesis Research on Computer Science and Engineering[Thesis Research on Computer Science and Engineering]

| Subject name[English] | Thesis Research on Computer Science and Engineering[Thesis Research on Computer | | | | | | |
|-------------------------------------|---|-----------------------|-----------------------|-----------------------|---------------------|--|--|
| | Science and Engi | neering | | Des test | D | | |
| Schedule number | M43610030 | Subject area | Advanced | Required or | Required | | |
| | | | Computer | elective | | | |
| | | | Science and | | | | |
| Time of starting a course | 2Years | Day of the | Intensive | Credit(s) | 6 | | |
| | | week,period | | | | | |
| Faculty | Graduate Program | n for Master's Degre | ee | Subject grade | 1~ | | |
| Department Offered | Computer Scienc | e and Engineering | | Beggining grade | M1, M2 | | |
| Charge teacher name[Roman | S3系教務委員, 3 | 3系各教員 3kei kyo | mu Iin−S, 3kei kakuk | xyouin | | | |
| alphabet mark] | | | | | | | |
| Numbering | | | | | | | |
| Objectives of class | | | | | | | |
| The course is intended for stude | nts to foster their i | nterests in researcl | n problems on comp | uter science and e | engineering and to | | |
| acquire ability for independent st | udies. | | | | | | |
| It is also aimed for students to ac | cquire, through thes | sis research, cooper | ativeness, a sense o | of responsibility, ab | ilities for problem | | |
| solving, research planning, decisio | on making, outcome | presentation and s | ubject investigation, | and to enhance th | neir creativity and | | |
| persistency, among others. | | | | | | | |
| | | | | | | | |
| Contents of class | | | | | | | |
| It is usually the case that thesis | research is carried | out on individual ba | ses with specific co | ntents differing fro | m one student to | | |
| another. | . | | | | | | |
| Consult with your advisor for any | further details. | | | | | | |
| Self Preparation and Review | | | | | | | |
| Consult with your advisor for the | m | | | | | | |
| Related subjects | | | | | | | |
| Consult with your advisor for the | m. | | | | | | |
| Notes for textbook | | | | | | | |
| Consult with your advisor for the | m. | | | | | | |
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| Notes for reference | | | | | | | |
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| Goals to be achieved | | | | | | | |
| To acquire abilities for doing res | search and develop | ment at technically | / high level, sophist | icated decision ma | aking, and leading | | |
| large scale research projects. | | | | | | | |
| Evaluation of achievement | | | | | | | |
| Three faculty members will be a | assigned to prepar | e the evaluation fo | or your thesis resea | arch, based on pu | blication records, | | |
| master thesis, and oral presentat | ion. It will be then | finalized by the facu | lty meeting. | | | | |
| | | | | | | | |
| その他 | | | | | | | |
| None during exam period | | | | | | | |
| Details of examination | | | | | | | |
| | | | | | | | |
| Other information | | | | | | | |
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| Keterence UKL | | | | | | | |
| Office hours | | | | | | | |
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| Relations to attainment objective | s of learning and e | ducation | | | | | |
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Key words

(M4361003T)Thesis Research on Computer Science and Engineering[Thesis Research on Computer Science and Engineering]

| Subject name[English] | Thesis Research on Computer Science and Engineering[Thesis Research on Computer Science and Engineering] | | | | | | | |
|-------------------------------------|--|---------------------------|-------------------------------------|-------------------------|---------------------|--|--|--|
| Schedule number | M4361003T | Subject area | Advanced Computer Science and | Required or elective | Required | | | |
| | | | Engineering | | | | | |
| Time of starting a course | Year | Day of the week,period | Intensive | Credit(s) | 6 | | | |
| Faculty | Graduate Progran | n for Master's Degre | e | Subject grade | 2~ | | | |
| Department Offered | Computer Science | e and Engineering | | Beggining grade | M2 | | | |
| Charge teacher name[Roman | S3系教務委員, 3 | 3系各教員 3kei kyor | mu Iin−S, 3kei kakuk | youin | | | | |
| alphabet mark] | | | | | | | | |
| Numbering | | | | | | | | |
| Objectives of class | | | | | | | | |
| The course is intended for studer | nts to foster their i | nterests in research | n problems on comp | uter science and e | ngineering and to | | | |
| acquire ability for independent stu | udies. | | | | | | | |
| It is also aimed for students to ac | quire, through thes | is research, cooper | ativeness, a sense o | of responsibility, ab | ilities for problem | | | |
| solving, research planning, decisio | n making, outcome | presentation and si | ubject investigation, | and to enhance th | eir creativity and | | | |
| persistency, among others. | | | | | | | | |
| Contents of alass | | | | | | | | |
| It is usually the case that thesis | research is carried | out on individual ba | ses with specific co | ntents differing fro | m one student to | | | |
| another | escaron is carried | | ses with specific co | internes unrening iro | in one student to | | | |
| Consult with your advisor for any | further details. | | | | | | | |
| | | | | | | | | |
| Self Preparation and Review | | | | | | | | |
| Consult with your advisor for the | m. | | | | | | | |
| Related subjects | | | | | | | | |
| Consult with your advisor for the | m | | | | | | | |
| Notes for textbook | | | | | | | | |
| Consult with your advisor for the | n. | | | | | | | |
| | | | | | | | | |
| Notes for reference | | | | | | | | |
| | | | | | | | | |
| Goals to be achieved | | | | | | | | |
| To acquire abilities for doing res | earch and develop | ment at technically | high level, sophist | icated decision ma | king, and leading | | | |
| large scale research projects. | | | | | | | | |
| Evaluation of achievement | | | | | | | | |
| Three faculty members will be a | assigned to prepar | e the evaluation fo | r your thesis resea | arch, based on pu | blication records, | | | |
| master thesis, and oral presentat | on. It will be then | finalized by the facu | Ity meeting. | | | | | |
| Examination | | | | | | | | |
| その他 | | | | | | | | |
| None during exam period | | | | | | | | |
| | | | | | | | | |
| Other information | | | | | | | | |
| | | | | | | | | |
| Reference URL | | | | | | | | |
| Office hours | | | | | | | | |
| Umice nours | | | | | | | | |
| Deletions & 11 1 1 1 | | 4 | | | | | | |
| Relations to attainment objective | s of learning and e | ducation | | | | | | |
| | | | | | | | | |
| | | | | | | | | |

Key words

(M43610040)Seminar on Computer Science and Engineering[Seminar on Computer Science and Engineering]

| Subject name[English] | Seminar on C | omputer Science | and Engineering[Se | eminar on Compu | ter Science and |
|------------------------------------|---------------------|-----------------------|-------------------------|------------------------|--------------------|
| | Engineering] | | | | |
| Schedule number | M43610040 | Subject area | Advanced | Required or | Required |
| | | | Computer | elective | |
| | | | Science and | | |
| | | | Engineering | | |
| Time of starting a course | Year | Day of th | e Intensive | Credit(s) | 6 |
| Facultar | Cuaduata Duaru | week,period | | Subject mede | 201 |
| Paculty Department Offered | Graduate Frogra | an for Master's De | gree | Subject grade | 2.0 M2 |
| Department Offered | Computer Scien | ice and Engineerin | 5 | grade | IVIZ |
| Charge teacher name[Roman | S3系教務委員, | 3系各教員 3kei k | yomu Iin−S, 3kei kakı | ıkyouin | |
| alphabet mark | | | | | |
| Numbering | | | | | |
| Objectives of class | | | | | |
| The course is intended for stud | dents to study b | asic materials in | lepth, related to his | /her research subj | ects in computer |
| science and engineering. | | | | | |
| It is also aimed for students to a | acquire various sl | kills, required in ge | neral research work, | such as those for | oral presentation, |
| and technical discussion and writ | ing. | | | | |
| Contents of class | | | | | |
| While specific contents depend | on the research | areas students ar | e involved in, it is us | sually the case for | students to read |
| relevant textbooks/research pape | ers and report on | them, as well as to | present and discuss | on the research we | ork of their own. |
| Self Preparation and Review | | | | | |
| Consult with your advisor. | | | | | |
| Related subjects | | | | | |
| Consult with your advisor. | | | | | |
| Notes for textbook | | | | | |
| Consult with your advisor. | | | | | |
| Notes for reference | | | | | |
| Goals to be achieved | | | | | |
| To acquire abilities for technical | readings in Englisł | n. logical thinking/e | xplanation, and clear | presentation. | |
| Evaluation of achievement | | ., | | | |
| Will be evaluated by taking into | accout various fa | ctors overall, such | , as technical explan | ation question ans | wering discussion |
| involvements and so on | | | | action, queeners artes | |
| Examination | | | | | |
| その他 | | | | | |
| None during exam period | | | | | |
| Details of examination | | | | | |
| | | | | | |
| Other information | | | | | |
| Reference URL | | | | | |
| Office hours | | | | | |
| | | | | | |
| Relations to attainment objective | s of learning and | education | | | |
| | | | | | |
| | | | | | |
| | | | | | |
| | | | | | |

Key words

(M43630100)Image Processing, Advanced[Image Processing, Advanced]

| Subject name[English] | Image Processing, Advanced[Image | Processing, Adv | anced] | | |
|---------------------------|-------------------------------------|---------------------------|---------------------|------------------|----------|
| Schedule number | M43630100 | Subject area | Advanced | Required or | Elective |
| | | | Computer | elective | |
| | | | Science and | | |
| | | | Engineering | | |
| Time of starting a course | Fall term | Day of the week.period | Tue.2~2 | Credit(s) | 2 |
| Faculty | Graduate Program for Master's De | gree | 1 | Subject grade | 1~ |
| Department Offered | Computer Science and Engineering | 5 | | Beggining | M1, M2 |
| Charge teacher | 全澤 诘 苎公 保之 KANA7AWA | Vasushi SUGAVA | Yasuvuki | grade | |
| name[Roman alphabet | | | Tasuyuki | | |
| mark | | | | | |
| Numbering | | | | | |
| | | | | | |
| Objectives of class | | | | | |
| This course involves fun | idamentals and advanced issues on i | mage processing | and computer vision | | |
| | | | | | |
| This course involves fun | damentals and advanced issues on i | mage processing | and computer vision | | |
| | | | | | |
| Contents of class | | | | | |
| [Kanazawa] | | | | | |
| 1: Introduction | | | | | |
| 2: Projective Geometry | | | | | |
| 3: Epipolar Geometry | | | | | |
| 4: 3-D Reconstruction f | rom Two Views | | | | |
| 5: Affine Projection | | | | | |
| 6: Uncalibrated Stereo | | | | | |
| 7: Structure from Motion | n | | | | |
| 8: Experiments | | | | | |
| | | | | | |
| [Sugaya] | | | | | |
| 9: Mathematical Introduc | ction | | | | |
| 10: Limits of Functions | | | | | |
| 11: Optimization of Fund | otions | | | | |
| 12: Least Squares | | | | | |
| 13: Advance of Least So | quares | | | | |
| 14: Non-linear Optimizat | tion | | | | |
| 15: Maximum Likelihood | | | | | |
| | | | | | |
| [Kanazawa] | | | | | |
| 1: Introduction | | | | | |
| 2: Projective Geometry | | | | | |
| 3: Epipolar Geometry | | | | | |
| 4: 3-D Reconstruction f | rom Two Views | | | | |
| 5: Affine Projection | | | | | |
| 6: Uncalibrated Stereo | | | | | |
| 7: Structure from Motion | 1 | | | | |
| 8: Experiments | | | | | |
| l | | | | | |
| [Sugaya] | | | | | |
| 9: Mathematical Introduc | ction | | | | |
| 10: Limits of Functions | | | | | |
| 11: Optimization of Fund | ptions | | | | |
| 12: Least Squares | | | | | |
| 13: Advance of Least So | quares | | | | |
| 14: Non-linear Optimizat | tion | | | | |
| 15: Maximum Likelihood | | | | | |

| Self Preparation and R | eview | | | | | | |
|--|-------------------|----------------------------------|-----------------|-------------------------------|--------------|------|--|
| Related subjects | | | | | | | |
| Geometry, Linear Algeb | ora. Statistics. | | | | | | |
| Geometry, Linear Algeb | ora. Statistics. | | | | | | |
| Notes for textbook | , | | | | | | |
| Handouts will be prepar | red | | | | | | |
| Handouts will be prepar Handouts will be prepar | red. | | | | | | |
| Reference1 | Book title | Multiple View Geom | etry in Compute | er Vision | ISBN | | |
| | Dook cide | | | | | | |
| | Author | R.I. Hartley and A. Zisserman | Publisher | Cambridge University Press | Publish year | 2000 | |
| Reference2 | Book title | Computer Vision | - A Modern Appr | roach | ISBN | | |
| | Author | D.A. Forsyth and J. Ponce | Publisher | Prentice Hall | Publish year | 2003 | |
| Notes for reference | | | | | | | |
| Goals to be achieved | | | | | | | |
| Understanding of the fu | undamentals and | d advanced issues on | image processin | g and computer vision | n including: | | |
| – camera model, | | | | | | | |
| – epipolar geometry, | | | | | | | |
| - 3-D reconstruction fi | rom images, | | | | | | |
| optimization | | | | | | | |
| Understanding of the fu | undamentals and | d advanced issues on | image processin | g and computer vision | n including: | | |
| – camera model, | | | 0. | | 0 | | |
| – epipolar geometry, | | | | | | | |
| - 3-D reconstruction fr | rom images, | | | | | | |
| - optimization | - | | | | | | |
| Evaluation of achievem | ent | | | | | | |
| Grade will be determine | ed by all submit | ted reports: | | | | | |
| A: score >= 80 | 5 | · | | | | | |
| B: score ≻= 65 | | | | | | | |
| C: score >= 55 | | | | | | | |
| Grade will be determine | ed by all submit | ted reports: | | | | | |
| A: score >= 80 | - | | | | | | |
| B: score ≻= 65 | | | | | | | |
| C: score >= 55 | | | | | | | |
| Examination | | | | | | | |
| レポートで実施 | | | | | | | |
| By Report | | | | | | | |
| Details of examination | | | | | | | |
| | | | | | | | |
| Other information | En alla l | | | | | | |
| Room F-404, Ext. 6888 | , Email: kanazav | va@cs.tut.ac.jp(Yasus @:: | ni Kanazawa) | | | | |
| Room C-507, Ext. 6760 | , Email: sugaya | wiim.cs.tut.ac.jp (Yasu) | yuki Sugaya) | | | | |
| Room F-404, Ext. 6888, Email: kanazawa@cs.tut.ac.jp (Yasushi Kanazawa) | | | | | | | |
| Room C-507, Ext. 6760 |), Email: sugaya@ | @iim.cs.tut.ac.jp (Yasu <u>y</u> | yuki Sugaya) | | | | |
| Reference URL | | | | | | | |
| http://www.img.cs.tut.a | ic.jp∕ | | | | | | |
| http://www.iim.cs.tut.ac | c.jp∕ | | | | | | |
| http://www.img.cs.tut.a | ic.jp/ | | | | | | |
| http://www.iim.cs.tut.ac | c.jp/ | | | | | | |
| Office hours | | | | | | | |
| Relations to attainment | t objectives of | learning and educatior | n | | | | |
| | | | | | | | |

Key words

image processing, computer vision image processing, computer vision

(M43630150)Computer Systems, Advanced[Computer Systems, Advanced]

| Subject name[English] | Computer System | as Advanced[C | ompi | iter Systems Adva | nced] | | |
|---|--|------------------|--------|------------------------|------------------|----------|--|
| | M43630150 | Subject area | omp | Advanced | Bequired or | Elective | |
| | 10143030130 | Subject area | | Computor | | LIECTIVE | |
| | | | | Computer Science | 01000100 | | |
| | | | | Science and | | | |
| Time of starting a source | Fall term | Day of | the | | Credit(a) | 2 | |
| Time of scarcing a course | Fail terni | Day Of | ule | Tue. I te I | Great(s) | 2 | |
| Faculty | Graduate Program | n for Master's [| e e | Subject grade | 1~ | | |
| Department Offered | Computer Scienc | e and Engineeri | ing | | Beggining | M1. M2 | |
| | | | | | grade | , | |
| Charge teacher name[Roman | 小林 良太郎 KO | BAYASHI Ryot | aro | | • | | |
| alphabet mark] | | | | | | | |
| Numbering | | | | | | | |
| Objectives of class | | | | | | | |
| This lecture introduces some imp | ortant topics on de | signing comput | er sv | stems. | | | |
| This lecture introduces some imp | ortant topics on de | signing comput | er sv | stems. | | | |
| Contents of class | · · · | | | | | | |
| 1) Introduction to computer archi | itecture | | | | | | |
| 2) Instruction set architecture | | | | | | | |
| 3) Behavior of control instruction | ı | | | | | | |
| 4) Behavior of memory instruction | n | | | | | | |
| 5) Continuous instruction process | sing in single cycle | processor | | | | | |
| 6) Pipeline processor | | | | | | | |
| 7) Data hazard in pipeline | | | | | | | |
| 6) Behavior of dependent arithme | tic instructions in p | pipeline | | | | | |
| 7) Behavior of dependent memory | y instructions in pip | eline | | | | | |
| 8) Memory hierarchy | | | | | | | |
| 9) Direct map cache | | | | | | | |
| 10) Cache update operation | | | | | | | |
| 11) Set associative cache | | | | | | | |
| 12) Control hazard in pipeline | | | | | | | |
| 13) Branch direction prediction | | | | | | | |
| 14) Branch target prediction | | | | | | | |
| 15) Speculative execution based | on branch predictio | 'n | | | | | |
| 16) Examination | | | | | | | |
| 1) Introduction to computer archi | tecture | | | | | | |
| 2) Instruction set architecture | | | | | | | |
| 3) Behavior of control instruction | I | | | | | | |
| 4) Behavior of memory instruction | n | | | | | | |
| 5) Continuous instruction process | sing in single cycle | processor | | | | | |
| b) Pipeline processor c) Data barand in pipeline | | | | | | | |
| 7) Data riazard in pipeline | tia instanctions in . | in a lin a | | | | | |
| a) Behavior of dependent artrine 7) Reporter of dependent memory | uc instructions in p | | | | | | |
| 8) Memory hierarchy | | enne | | | | | |
| 9) Direct map cache | | | | | | | |
| 10) Cache undate operation | | | | | | | |
| 11) Set associative cache | | | | | | | |
| 12) Control hazard in pipeline | | | | | | | |
| 13) Branch direction prediction | | | | | | | |
| 14) Branch target prediction | | | | | | | |
| 15) Speculative execution based | on branch predictio | n | | | | | |
| 16) Examination | | | | | | | |
| Self Preparation and Review | | | | | | | |
| Preparation and review based on | the given course m | aterials is help | ful fo | r understanding the | above-mentioned | items. | |
| Although there is no use to buy t | he following referer | nce book in this | clas | s, a tiny part of it m | nay be helpful. | | |
| * Computer Architecture A Quan | titative Approach, . | John L. Hennes | sy Da | avid A. Patterson (I | SBN-13: 978-9381 | 269220) | |
| Preparation and review based on | the given course materials is helpful for understanding the above-mentioned items. | | | | | | |

Although there is no use to buy the following reference book in this class, a tiny part of it may be helpful.
| * Computer Architecture A Quantitative Approach, John L. Hennessy David A. Patterson (ISBN-13: 978-9381269220) |
|--|
| Related subjects |
| |
| Notes for textbook |
| Course materials and references will be given by the lecturer. |
| Course materials and references will be given by the lecturer. |
| Notes for reference |
| Goals to be achieved |
| Students are required to obtain the knowledge on the above-mentioned items. |
| Students are required to obtain the knowledge on the above-mentioned items. |
| Evaluation of achievement |
| Attendance to all classes is compulsory. Absence without reasonable excuses (for example, oversleeping and lapse of memo is unacceptable. |
| There will be a term-end examination. The evaluation is performed based on the followings: |
| A: score is more than 80 points |
| B: score is more than 65 points |
| C: score is more than 55 points |
| Attendance to all classes is compulsory. Absence without reasonable excuses (for example, oversleeping and lapse of memo is unacceptable. |
| There will be a term-end examination. The evaluation is performed based on the followings: |
| A: score is more than 80 points |
| B: score is more than 65 points |
| C: score is more than 55 points |
| |
| Evenination |
| |
| た対抗隊で天地(対面) Evamination(Eaco) |
| Details of examination |
| |
| Other information |
| Reference URL |
| Office hours |
| Students are to make an appointment via e-mail if they want to see the lecturer. |
| Students are to make an appointment via e-mail if they want to see the lecturer. |
| Relations to attainment objectives of learning and education |
| |
| |
| |
| |
| Key words |
| Computer architecture, Pipelining, Cache, Branch prediction |
| Computer architecture. Pipelining. Cache. Branch prediction |
| |

(M43630240)Networking, Advanced 1[Networking, Advanced 1]

| Subject name[English] | Networking, Advanced 1[Networking, Advanced 1] | | | | | | |
|--|--|---------------------------|--|-------------------------|----------|--|--|
| Schedule number | M43630240 | Subject area | Advanced Computer Science and Engineering | Required or elective | Elective | | |
| Time of starting a course | Fall1 term | Day of the week,period | Wed.1~1 | Credit(s) | 1 | | |
| Faculty | Graduate Program for Master's De | Subject grade | 1~ | | | | |
| Department Offered | Computer Science and Engineerin | g | | Beggining grade | M1, M2 | | |
| Charge teacher name[Roman alphabet mark] | 梅村 恭司 UMEMURA Kyoji | | | | | | |
| Numbering | | | | | | | |

Objectives of class

The objective of this class is mastering both profound and advanced networking technologies. Precise protocols are lectured to enhance the knowledge of Internet.

The objective of this class is mastering both profound and advanced networking technologies. Precise protocols are lectured to enhance the knowledge of Internet.

Contents of class

- 1. Link Layer
- 2. Internet Protocol
- 3. Address Resolution Protocol
- 4. Internet Control Message Protocol
- 5. IP routing and Dynamic Routing Protocol
- 6. Transmission Control Protocol
- 7. TCP interactive and bulk data flow

1. Link Layer

- 2. Internet Protocol
- 3. Address Resolution Protocol
- 4. Internet Control Message Protocol
- 5. IP routing and Dynamic Routing Protocol
- 6. Transmission Control Protocol
- 7. TCP interactive and bulk data flow

Self Preparation and Review

Related subjects

The ability to write simple client/server programs are required.

The ability to write simple client/server programs are required.

| Textbook1 | Book title | TCP/IF | 9 Illustrated | Volume. 1, The | ISBN | | | |
|--|-----------------|--------|---------------|----------------|----------------|--------------|--|--|
| | Author | W. | Richard | Publisher | Addison-wesley | Publish year | | |
| | | Steven | s | | | | | |
| Notes for textbook | | | | | | | | |
| TCP/IP Illustrated Volur | ne. 1, The Prot | ocols, | | | | | | |
| W. Richard Stevens, Add | lison-wesley | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| TCP/IP Illustrated Volume 1. The Protocols | | | | | | | | |
| W Dishand Stated Volu | | | | | | | | |
| w. Richard Stevens, Add | lison-wesley | | | | | | | |

Notes for reference

Goals to be achieved

The goal is to understand the way that computer network works precisely. The goal is to understand the way that computer network works precisely.

Evaluation of achievement

Examination will be held in the last class.

Examination will be held in the last class.

Examination

定期試験を実施(対面) Examination(Face to Face) **Details of examination**

Other information

C-304 umemura@tut.jp

C-304 umemura@tut.jp

Reference URL

http://www.ss.cs.tut.ac.jp/ http://www.ss.cs.tut.ac.jp/

Office hours From 10:00AM to 13:00, Tue to Fri

 $(\mbox{Appointment are strongly recommended})$

From 10:00AM to 13:00, Tue to Fri (Appointment are strongly recommended)

Relations to attainment objectives of learning and education

Key words

Computer Network, Distributed Systems Computer Network, Distributed Systems

(M43630250)Networking, Advanced 2[Networking, Advanced 2]

| Subject name[English] | Networking, Advanced 2[Networking, Advanced 2] | | | | | | |
|---|--|---------------------------|--|-------------------------|----------|--|--|
| Schedule number | M43630250 | Subject area | Advanced Computer Science and Engineering | Required or elective | Elective | | |
| Time of starting a course | Fall2 term | Day of the week,period | Wed.1~1 | Credit(s) | 1 | | |
| Faculty | Graduate Program for Master's De | gree | | Subject grade | 1~ | | |
| Department Offered | Computer Science and Engineering | 5 | | Beggining grade | M1, M2 | | |
| Charge teacher name[Roman alphabet mark] Numbering | 大村 廉 OMURA Ren | | | | | | |

Objectives of class

The aim of this class is to understand the concepts, system architecture, and algorithm in distributed computing. The class will cover both of theoretical discussion and practical applications.

The contents will focus on advanced topics in distributed systems, namely the knowledge of computer network and basics of distributed systems are required beforehand.

The aim of this class is to understand the concepts, system architecture, and algorithm in distributed computing. The class will cover both of theoretical discussion and practical applications.

The contents will focus on advanced topics in distributed systems, namely the knowledge of computer network and basics of distributed systems are required beforehand.

| Contents of class | | | | | | | |
|------------------------|-------------------|-----------------|----------|--------------------|--------------------|---------------|--------------------|
| From the 1st to 2rd w | eek; Synchroniz | ation | | | | | |
| From the 2nd to 3rd w | veek; Consisten | су | | | | | |
| From the 4nd to 5rd w | /eek; Fault toler | ance | | | | | |
| From the 6th to 7th w | eek; Security | | | | | | |
| The 8th week; Examin | ation or additior | nal topics | | | | | |
| From the 1st to 2rd w | eek; Synchroniz | ation | | | | | |
| From the 2nd to 3rd w | eek; Consisten | су | | | | | |
| From the 4nd to 5rd w | /eek; Fault toler | ance | | | | | |
| From the 6th to 7th w | eek; Security | | | | | | |
| The 8th week; Examin | ation or additior | nal topics | | | | | |
| Self Preparation and I | Review | | | | | | |
| It is strongly recomm | ended to read | over the refer | ence bo | ook, "Distributed | Systems: Principle | s and Paradig | gms (2nd Edition)″ |
| and to search keyword | ds in the book o | n Internet to f | ind prac | ctical examples. | | | |
| It is strongly recomm | ended to read | over the refer | ence bo | ook, "Distributed | Systems: Principle | s and Paradig | gms (2nd Edition)″ |
| and to search keyword | ds in the book o | n Internet to f | ind prac | ctical examples. | | | |
| Related subjects | | | | | | | |
| Computer Network, O | perating System | ns, System Pro | ogrammi | ng, (Basics of Dis | tributed Systems) | | |
| Computer Network, O | perating System | ns, System Pro | ogrammi | ng, (Basics of Dis | tributed Systems) | | |
| Textbook1 | Book title | Distributed | System | s: Principles and | I Paradigms(2nd | ISBN | 978- |
| | | Edition) | | | | | 0132392273 |
| | Author | Andrew | S. | Publisher | Prentice Hall | Publish | 2006 |
| | | Tanenbaum, | and | | | year | |
| | | Maarten | Van | | | | |
| | | Steen | | | | | |
| Notes for textbook | • | • | | | | | |
| | c | | | | | | |

Basically, materials referenced in the class are passed out in the class.

Basically, materials referenced in the class are passed out in the class.

Notes for reference

Related materials, such as books, videos, and web pages, are introduced in the class.

Related materials, such as books, videos, and web pages, are introduced in the class.

Goals to be achieved

The aim of this class is to understand;

(1) the basic methods and concepts of synchronization in distributed systems;

(2) the concepts and variations of consistency in distributed systems;

(3) the basic concepts and methods of fault tolerance in distributed systems;

 $\ensuremath{\left(4\right)}$ the basic concepts of security in distributed systems;

 $(\mathbf{5})$ and some practical examples of distributed systems.

The aim of this class is to understand;

(1) the basic methods and concepts of synchronization in distributed systems;

(2) the concepts and variations of consistency in distributed systems;

(3) the basic concepts and methods of fault tolerance in distributed systems;

(4) the basic concepts of security in distributed systems;

(5) and some practical examples of distributed systems.

Evaluation of achievement

The achievement of students are evaluated mainly with a paper test or a report, while the score of quizzes held in the class and attendance ratio are taken into account.

A: 80 and over

B: 65 and over

C: 55 and over

The achievement of students are evaluated mainly with a paper test or a report, while the score of quizzes held in the class and attendance ratio are taken into account.

A: 80 and over

B: 65 and over

C: 55 and over

Examination その他

Other

Details of examination

A paper examination is carried out in the last class OR a report related to distributed systems is assigned. These are selected according to the number of students.

A paper examination is carried out in the last class OR a report related to distributed systems is assigned. These are selected according to the number of students.

Other information

Teacher's Room: C-509 Internal Phone Number: 6750 E-mail: ren@tut.jp Teacher's Room: C-509 Internal Phone Number: 6750

E-mail: ren@tut.jp

http://www.usl.cs.tut.ac.jp http://www.usl.cs.tut.ac.jp

Office hours

You can ask any questions anytime by e-mail. If you come to the teacher's office, you need to have an appointment. You can ask any questions anytime by e-mail. If you come to the teacher's office, you need to have an appointment. **Relations to attainment objectives of learning and education**

Key words

Distributed System, Computer Network, Operating System Distributed System, Computer Network, Operating System

| (M43630260)Advanced | Robotics and I | Informatics 1[Advand | ced Robotics and | Informatics 1] | | |
|--------------------------|------------------------------|--|---------------------|--------------------------|-------------------|-------------------|
| | Advanced Ro | obotics and Informati | ics 1[Advanced R | Robotics and Information | atics 1] | |
| name[Englisn] | M42630260 | | Subject area | Advanced | Dogwired or | Floative |
| Schednie unumper | 10143030200 | | SUDJECT area | Advanced | Required of | Elecuve |
| | | | | Computer | GIGCTIVE | |
| | | | | Science and | | |
| The of standing of | | | Dec. of the | Engineering | | - |
| Time of starting a | Fall I term | | Day of the | Tue.3~3 | Gredit(s) | 1 |
| course | | C. Mustavia F | week,perioa | | + | <u> </u> |
| Faculty | Graduate ro | ogram for Master s ں | Jegree | | Subject | 1~ |
| - + Offered | 2 | | | | grade | 11 140 |
| Department Untered | Computer St | cience and Engineerin | ng | | Beggining | M1, M2 |
| ~· | - `+` 4:# MII | | | | grade | |
| Charge teacner | 三浦 絖 เพเด | JRA Jun | | | | |
| namelRoman | | | | | | |
| alphabet mark | | | | | | |
| Numbering | | | | | | |
| Objectives of class | | | | | | |
| Fundamental and adva | nced issues in | n intelligent robotics | s will be discuss | ed Topics included | t are probabilist | tic sensor fusion |
| techniques (e.g., Kalmar | n filter) and its | application to mobile | e robot localizatio | on and mapping | | |
| Fundamental and adva | mood issues in | n intelligent robotics | s will be discuss | ad Tonics includer | - are probabilist | tic sensor fusion |
| +ophniques (e.g. Kalmar | - filter) and ite | application to mobile | will be discusse | ed. Topics included | | IC SCHOOL LUSION |
| Contente of algee | | | 3 TODOL IOGANZAGO | | | |
| We -le 1. Internetion to | | '''''''''''''''''''''''''''''''''''''' | | | | |
| Week I: Introduction to | scene recogni | tion and sensor rusic | on. | | | |
| Week 2: Probability Dasi | c and bayes in | ilter. | | | | |
| Week 3: Kalman Tiller an | id its extension | ns. | | | | |
| Week 4: Nonparametric | filters. | | | | | |
| Week 5: Mobile robot ion | calization. | | | | | |
| Week 6: Mobile robot ma | apping. | | | | | |
| Week 7: SLAM (Simultar | neous Localiza | ation and Mapping). | | | | |
| Week 8: Presentations of | of students' rer | ports and conclusion | 1S. | | | |
| Week 1: Introduction to | scene recogni | ition and sensor fusio | on. | | | |
| Week 2: Probability basi | ic and Bayes ti | ilter. | | | | |
| Week 3: Kalman filter ar | nd its extension | ns. | | | | |
| Week 4: Nonparametric | filters. | | | | | |
| Week 5: Mobile robot lo | calization. | | | | | |
| Week 6: Mobile robot m | apping. | | | | | |
| Week 7: SLAM (Simulta | neous Localiza | ation and Mapping). | | | | |
| Week 8: Presentations (| of students' re [,] | ports and conclusion | ns. | | | |
| Self Preparation and Re | eview | | | | | |
| | | | | | | |
| D-lated subjects | | | | | | |
| | <u></u> | | | | | |
| Fundamental knowledge | of linear alger | ora and probability th | ieory are usetui. | | | |
| Fundamental knowledge | of linear alger | ora and probability th | ieory are usetui. | | | |
| Notes for textbook | · | | | | | |
| Handouts will be prepar | ed. The main r | eference is shown be | elow. | | | |
| | | | | | | |
| Handouts will be prepar | ed. The main r | reference is shown b | elow. | | | |
| | | | | | | |
| Deference1 | Beek title | Brobabilistia Babs | -+: | | ICON | 070_ |
| Keterence | BOOK TILIS | Propapilistic Robo | TICS | | 1981 | 9/8- |
| | | | | T | <u> </u> | 0262201629 |
| | Author | S. Thrun, W. | Publisher | The MIT Press | Publish year | 2005 |
| | | Burgard, D. Fox | | | | |
| Notes for reference | | | | | | |
| | | | | | | |
| Goale to be achieved | | | | | | |
| Understanding of the fu | indomentals of | f concor fusion strate | arian and algorithe | ~ ^ | | |
| Understanding of the fu | noamentais of | Sensor Iusion surate | gles and algorithm | ns. | | |
| | | Sensor Tusion Suale | gles and algorithm | ns. | | |
| Evaluation of achievem | ant | | | | | |

Grade will be determined by the report.

Grade will be determined by the report.

Examination

レポートで実施 By Report

Details of examination

Other information

Room C-604, Ext. 6773, Email: jun.miura@tut.jp (Jun Miura)

Room C-604, Ext. 6773, Email: jun.miura@tut.jp (Jun Miura)

Reference URL

http://www.aisl.cs.tut.ac.jp/classes/robotics-and-informatics/ ID and password will be given at the class.

http://www.aisl.cs.tut.ac.jp/classes/robotics-and-informatics/

 $\ensuremath{\text{ID}}$ and password will be given at the class.

Office hours

Make an appointment beforehand by email.

Make an appointment beforehand by email.

Relations to attainment objectives of learning and education

Key words Robotics

Robotics

(M43630270)Advanced Robotics and Informatics 2[Advanced Robotics and Informatics 2]

| Subject name[English] | Advanced Robotics and Information | Advanced Robotics and Informatics 2[Advanced Robotics and Informatics 2] | | | | | | |
|-----------------------|-----------------------------------|--|-------------|-------------|----------|--|--|--|
| Schedule number | M43630270 | 3630270 Subject area Advanced | | Required or | Elective | | | |
| | | | Computer | elective | | | | |
| | | | Science and | | | | | |
| | | | Engineering | | | | | |
| Time of starting a | Fall2 term | Day of the | Tue.3~3 | Credit(s) | 1 | | | |
| course | | week,period | | | | | | |
| Faculty | Graduate Program for Master's D | egree | | Subject | 1~ | | | |
| | | | | grade | | | | |
| Department Offered | Computer Science and Engineerin | g | | Beggining | M1, M2 | | | |
| | | | | grade | | | | |
| Charge teacher | 岡田 美智男 OKADA Michio | | | | | | | |
| name[Roman alphabet | | | | | | | | |
| mark] | | | | | | | | |
| Numbering | | | | | | | | |
| Objectives of class | | | | | | | | |

Fundamental and advanced issues on social robotics will be discussed such as historical background of cognitive robotics, embodied cognition, organizing social interaction and applications of social robots.

Fundamental and advanced issues on social robotics will be discussed such as historical background of cognitive robotics, embodied cognition, organizing social interaction and applications of social robots.

Contents of class

- Historical background of cognitive robotics
- Situated cognition and biological-inspired robots
- Embodiment and social embeddedness
- Organizing social interaction in social robots
- Socially assistive robotics
- Presentation and discussion

- Historical background of cognitive robotics

- Situated cognition and biological-inspired robots
- Embodiment and social embeddedness
- Organizing social interaction in social robots
- Socially assistive robotics
- Presentation and discussion

Self Preparation and Review

Related subjects

Fundamentals of cognitive science. Fundamentals of cognitive science. Notes for textbook

Handouts will be prepared.

Handouts will be prepared.

| Reference1 | Book title | Understanding Inte | elligence | ISBN | | |
|----------------------|------------|---------------------------|-----------|--------------|------|--|
| | Author | R. Pfeifer, C. Scheier | Publisher | Publish year | 2001 | |
| Notes for reference | | | · | | | |
| Goals to be achieved | | | | | | |

Understanding of the fundamentals of social robotics including:

| Historical background of cognitive robotics | |
|---|--|
| Situated cognition and biological-inspired robots | |
| - Embodiment and social embeddedness | |
| Organizing social interaction in social robots | |
| - Socially assistive robotics | |
| | |
| Understanding of the fundamentals of social robotics including: | |
| - Historical background of cognitive robotics | |
| - Situated cognition and biological-inspired robots | |
| - Embodiment and social embeddedness | |
| - Organizing social interaction in social robots | |
| - Socially assistive robotics | |
| Evaluation of achievement | |
| Grade will be determined by the presentation and final report. | |
| | |
| Grade will be determined by the presentation and final report. | |
| Examination | |
| レポートで実施 | |
| By Report | |
| Details of examination | |
| Other information | |
| Room F-402, Ext, 6886, Email: okada[at]tut.jp (Michio Okada) | |
| Room F-402, Ext, 6886, Email: okada[at]tut.jp (Michio Okada) | |
| Reference URL | |
| http://www.icd.cs.tut.ac.jp/en/profile.html | |
| http://www.icd.cs.tut.ac.jp/en/profile.html | |
| Office hours | |
| Tuesday, 14:30-16:00 | |
| Tuesday, 14:30-16:00 | |
| Relations to attainment objectives of learning and education | |
| | |
| | |
| | |
| | |
| | |
| Key words | |
| Social Robotics, Cognitive Robotics, Social Interaction | |
| | |

(M43630300)Complex Systems and Intelligent Informatics 1[Complex Systems and Intelligent Informatics 1]

| Subject name[English] | Complex Systems and Intelligent Informatics 1[Complex Systems and Intelligent Informatics | | | | | | | |
|------------------------------------|---|---------------------------|-------------------------------------|-------------------------|--------------------|--|--|--|
| Schedule number | M43630300 | Subject area | Advanced Computer Science and | Required or elective | Elective | | | |
| Time of starting a course | Fall1 term | Day of the week,period | Engineering Wed.3~3 | Credit(s) | 1 | | | |
| Faculty | Graduate Program | n for Master's Degr | ee | Subject grade | 1~ | | | |
| Department Offered | Computer Scienc | e and Engineering | | Beggining grade | M1, M2 | | | |
| Charge teacher name[Roman | 村越 一支 MURA | AKOSHI Kazushi | | | | | | |
| alphabet mark] | | | | | | | | |
| Numbering | | | | | | | | |
| Objectives of class | | | | | | | | |
| The aim of this class is to unders | tand complex and i | ntelligent systems. | | | | | | |
| To achieve the aim, this class off | ers knowledge and | skills for mathemati | cal modeling and sin | nulation methods. | | | | |
| The aim of this class is to unders | tand complex and i | ntelligent systems. | | | | | | |
| To achieve the aim, this class off | ers knowledge and | skills for mathemati | cal modeling and sin | nulation methods. | | | | |
| Contents of class | | | | | | | | |
| A. Introduction | | | | | | | | |
| What is complex and intelligent sy | stems? Outline of | the brain system. | | | | | | |
| B. Computational Neuroscience a | nd Application-orie | ented Mathematical | Models | | | | | |
| What is computational Neuroscier | nce and artificial ne | eural networks? | | | | | | |
| C. Model Neurons | - d-1 | | | | | | | |
| D Learning at connected part of | neurons. | | | | | | | |
| Synantic plasticity, spike-timing- | denendent plasticit | | | | | | | |
| E Simulation Methods | | y (01D1). | | | | | | |
| Numerical calculation methods for | r single neuron, neu | ural network from si | ngle neuron. | | | | | |
| F. Simulation Environments | | | | | | | | |
| Explanation and demonstration of | simulation environ | ments such as NEU | RON and GENESIS. | | | | | |
| G. Self-organizing | | | | | | | | |
| What is self-organizing? Winner T | akes All, Self-orga | nizing map (SOM) | | | | | | |
| H. Reinforcement Learning | | | | | | | | |
| What is reinforcement learning, | reinforcement lear | ning in the brain, o | lemonstration of re | inforcement learnir | ng for controlling | | | |
| robot | | | | | | | | |
| I. Summary | | | | | | | | |
| | | | | | | | | |
| 1st week: A | | | | | | | | |
| 2nd week: B | | | | | | | | |
| Ath week: D | | | | | | | | |
| 5th week: F F | | | | | | | | |
| 6th week: G | | | | | | | | |
| 7th week: H I | | | | | | | | |
| A. Introduction | | | | | | | | |
| What is complex and intelligent sy | stems? Outline of | the brain system. | | | | | | |
| B. Computational Neuroscience a | nd Application-orie | ented Mathematical | Models | | | | | |
| What is computational Neuroscier | nce and artificial ne | ural networks? | | | | | | |
| C. Model Neurons | | | | | | | | |
| Structure of neurons, synapse, m | odel neurons. | | | | | | | |
| D. Learning at connected part of | neurons (synapse) | | | | | | | |
| Synaptic plasticity, spike-timing- | dependent plasticit | y (STDP). | | | | | | |
| E. Simulation Methods | | | | | | | | |
| Numerical calculation methods for | r single neuron, nei | arai network from si | ngie neuron. | | | | | |
| Explanation and demonstration of | simulation environ | ments such as NEII | RON and GENESIS | | | | | |
| G Self-organizing | Simulation environ | ments such as NEU | NON ANU GENESIS. | | | | | |
| G. Jeli organizilig | | | | | | | | |

What is self-organizing? Winner Takes All, Self-organizing map (SOM) H. Reinforcement Learning What is reinforcement learning, reinforcement learning in the brain, demonstration of reinforcement learning for controlling robot I. Summary 1st week: A 2nd week: B 3rd week: C 4th week: D 5th week: E F 6th week: G 7th week: H I Self Preparation and Review **Related subjects** Notes for textbook Handouts are distributed. Handouts are distributed. Notes for reference Goals to be achieved - Know complex and intelligent mathematical models, and understand them at the degree which you can simulte them by your programming or by using simulation environment. - Can explain technical terms of complex and intelligent mathematical models. - Master numerical calculation methods that are used in complex and intelligent mathematical models. - Know complex and intelligent mathematical models, and understand them at the degree which you can simulte them by your programming or by using simulation environment. - Can explain technical terms of complex and intelligent mathematical models. - Master numerical calculation methods that are used in complex and intelligent mathematical models. Evaluation of achievement Examination 100% + alpha (Consideration, comment, and opinion in each content (A-H)) Examination 100% + alpha (Consideration, comment, and opinion in each content (A-H)) Examination 定期試験を実施(対面) Examination(Face to Face) **Details of examination** Other information Even school year: Murakoshi, F-507, ext. 6899, mura [at] tut.jp Even school year: Murakoshi, F-507, ext. 6899, mura [at] tut.jp **Reference URL** http://www.ci.cs.tut.ac.jp/~mura/ http://www.ci.cs.tut.ac.jp/~mura/ Office hours After this class After this class Relations to attainment objectives of learning and education

Key words

(M43630310)Complex Systems and Intelligent Informatics 2[Complex Systems and Intelligent Informatics 2]

| Subject name[English] | Complex Systems and Intelligent Informatics 2[Complex Systems and Intelligent Informatic 2] | | | | | | |
|--|--|---|--|-------------------------|----------|--|--|
| Schedule number | M43630310 | Subject area | Advanced Computer Science and Engineering | Required or elective | Elective | | |
| Time of starting a course | Fall2 term | Day of the week,period | Wed.3~3 | Credit(s) | 1 | | |
| Faculty | Graduate Program | n for Master's Degre | e | Subject grade | 1~ | | |
| Department Offered | Computer Scienc | e and Engineering | | Beggining grade | M1, M2 | | |
| Charge teacher name[Roman alphabet mark] | 石田 好輝 ISHID | A Yoshiteru | | | L | | |
| Numbering | | | | | | | |
| Objectives of class | | | | | | | |
| This course provides opportunitie * Modeling and analysis on comple * System theoretic analysis on co * Computer simulations and implie * Implementation of complex system Recent topics on complex system This course provides opportunitie * Modeling and analysis on complex | s to learn the follow ex systems and lea omplex systems and cations, and ems and learning syst is and learning syst s to learn the follow ex systems and lea | wings: rning systems, d learning systems , ystems. ems will be also dis wings: rning systems, | cussed in the cours | e. | | | |
| * System theoretic analysis on co * Computer simulations and impli * Implementation of complex system Recent topics on complex system | omplex systems and cations, and ems and learning syst is and learning syst | d learning systems , ystems. ems will be also dis | cussed in the cours | e. | | | |
| Contents of class 1. Introduction on complex dynam 2. Dynamical systems 3. Complex networks and interact 4. Cellular automata and neural ne 5. Information Processing by com 6. Emergence of cooperation in au 7. Learning algorithms for agen 9. Biological systems and informat 1. Introduction on complex dynam 2. Dynamical systems 3. Complex networks and interact 4. Cellular automata and neural ne 5. Information Processing by com 6. Emergence of cooperation in au 7. Learning algorithms for age 9. Biological systems 3. Complex networks and interact 4. Cellular automata and neural ne 5. Information Processing by com 6. Emergence of cooperation in au 7. Learning algorithms for agents 8. Evolutionary algorithms for agents 9. Biological systems and information 7. Learning algorithms for agents 8. Evolutionary algorithms for agents 9. Biological systems and information 9. Biological systems | ical systems ions etworks plex systems utonomous agents nts tion processing ical systems ions etworks plex systems utonomous agents nts tion processing | | | | | | |
| Related subjects | | | | | | | |
| Notes for textbook | | | | | | | |
| No textbook. References other th Ishida, Y.: Immunity-Based Syster Barabasi, A.L.: Linked, Perseus, (2 Strogatz, S. H. Sync, Hyperion (2 No textbook. References other th | an below will be su ns, Springer (2004) 002) 003) an below will be su | ggested at the first ; ggested at the first | class. class. | | | | |

Ishida, Y.: Immunity–Based Systems, Springer (2004); Barabasi, A.L.: Linked, Perseus, (2002) Strogatz, S. H. Sync, Hyperion (2003) Notes for reference

Goals to be achieved

Evaluation of achievement

Class performance (50%) and term-end report (50%) Class performance (50%) and term-end report (50%) Examination レポートで実施 By Report

Details of examination

Other information

Room F-504, Ext. 6895 Room F-504, Ext. 6895 **Reference URL**

Office hours

Wednesday 16:30-17:00 Wednesday 16:30-17:00

Relations to attainment objectives of learning and education

情報・知能工学専攻 (C)理論的・応用的知識の獲得と発展的活用能力 重要な学術・技術分野の理論・応用知識を自発的に獲得し、発展的に活用できる能力 (D)広範囲の知識を有機的に連携させた研究開発方法論の体得 広範囲の知識の連携による研究開発に対する方法論を体得し、研究開発の計画立案と、それを実践できる能力 (E)国内外において活躍できる表現力・コミュニケーションカ 論文、口頭及び情報メディアを通じて、自分の論点や考えなどを国の内外において効果的に表現し、コミュニケーションする能力 とプレゼンテーションする能力 (F)最新の技術や社会環境の変化に対する探究心と持続的学習力 社会、環境、技術等の変化に対応して、生涯にわたって自発的に学習する能力

Key words

complex systems, cellular automaton, artificial life, immuno intelligence, neural networks, evolutionary game theory complex systems, cellular automaton, artificial life, immuno intelligence, neural networks, evolutionary game theory

(M44610010)Seminar on Environmental and Life Science I[Seminar on Environmental and Life Science I]

| Subject name[English] | Seminar on Environmental and Life Science I[Seminar on Environmental and Life Science I] | | | | | | Life Science I] | |
|------------------------------------|--|--|------------------|----------|-----------------------|----------------------|--------------------|--|
| Schedule number | M44610010 | Subie | ct are | a | Advanced | Required | | |
| | | | | | Environmental | elective | | |
| | | | | | and Life | | | |
| | | | | | Sciences | | | |
| Time of starting a course | Year | Day | of | the | Intensive | Credit(s) | 3 | |
| | | week, | period | l | | | | |
| Faculty | Graduate Progran | n for Ma | aster's | Degre | ee | Subject grade | 1~ | |
| Department Offered | Environmental and | d Life S | cience | es | | Beggining | M1, M2 | |
| | | | | | | grade | | |
| Charge teacher name[Roman | S4系教務委員, 4 | S4系教務委員, 4系各教員 4kei kyomu Iin−S, 4kei kakukyouin | | | | | | |
| alphabet mark | | | | | | | | |
| Numbering | | | | | | | | |
| Objectives of class | | | | | | | | |
| This course will provide the stu | udents with opport | unities | to sti | udy or | n his/her research | subjects on enviro | onmental and life | |
| sciences by reading textbooks a | nd scientific papers | s under | the g | uidano | ce of his/her superv | visor. The aim of th | ne lessen for the | |
| students is to learn knowledge ar | nd presentation skil | ls requir | red for | r his/ł | her research in the s | eminar as well as t | o deepen his/her | |
| understanding of environmental a | nd life sciences. | | | | | | | |
| Contents of class | | | | | | | | |
| The students will be required to | read textbooks and | l papers | writt | en by | other language than | Japanese, especia | lly English, which | |
| are suggested by his/her supervi | sor, and to report a | nd disc | uss de | eply o | on his/her research | subject in the semi | nar. | |
| Self Preparation and Review | | | | | | | | |
| | | | | | | | | |
| Related subjects | | | | | | | | |
| Seminar on Environmental and Li | fe Science II | | | | | | | |
| Thesis Research on Environment | al and Life Science | | | | | | | |
| All other relevant subjects in Adv | anced Environment | tal and l | Life So | cience | S | | | |
| Notes for textbook | | | | | | | | |
| Supervisor will recommend textbe | ooks, papers, and re | esearch | mater | rials to | o students. | | | |
| Notes for reference | | | | | | | | |
| | | | | | | | | |
| Goals to be achieved | | | | | | | | |
| I o acquire basic knowledge on ei | nvironmental and lif | e scienc | ces | | | | | |
| To understand the contents of so | cientific papers in a | given fi | ield of | envir | onmental and life sci | ences | | |
| To be able to make oral and post | er presentations re | levant t | o pape | ers ne | / she has read. | | | |
| The evaluation is based on the | agaraa of roading i | toythool | ko one | d ania | atifia nonara diaqua | alana ranarta and | procentations of | |
| his /her research in the seminar | His/ber supervisor | | ns and ac tha | | nunic papers, discus | sions, reports and | presentations of | |
| Framination | | evaluation | 03 010 | 30010 | | | | |
| その他 | | | | | | | | |
| None during exam period | | | | | | | | |
| Details of examination | | | | | | | | |
| | | | | | | | | |
| Other information | | | | | | | | |
| Supervisor(s) | | | | | | | | |
| Reference URL | | | | | | | | |
| http://ens.tut.ac.ip/en/ | | | | | | | | |
| Office hours | | | | | | | | |
| Students are encouraged visiting | by appointment. | | | | | | | |
| Relations to attainment objective | s of learning and e | ducatio | n | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| Key words | | | | | | | | |
| Environmental science and techn | ology, life science, | material | ls scie | nce a | nd engineering, appli | ed chemistry | | |

(M44610020)Seminar on Environmental and Life Science II[Seminar on Environmental and Life Science II]

| Subject name[English] | Seminar on Enviro | onmental | and | Life S | cience II[Seminar on | Environmental and | d Life Science II] | | |
|---|-----------------------|-------------|------------|---------|------------------------|---------------------|---------------------|--|--|
| Schedule number | M44610020 | Subjec | t area | a | Advanced | Required or | Required | | |
| | 1111010020 | Cabjoo | | | Environmental | elective | Roquirou | | |
| | | | | | and Life | ciccure | | | |
| | | | | | Sciences | | | | |
| Time of starting a course | Year | Dav | of | the | Intensive | Credit(s) | 3 | | |
| | 1 out | week p | eriod | | | 010010(0) | 0 | | |
| Faculty | Graduate Program | n for Mas | ster's | 26 | Subject grade | 2~ | | | |
| Department Offered | Environmental and | d Life Sc | ience | S | | Beggining | M2 | | |
| | | | | | | | | | |
| Charge teacher name[Roman | | | | | | | | | |
| alphabet mark] | | | | | | | | | |
| Numbering | | | | | | | | | |
| | | | | | | | | | |
| Objectives of class | | | | | | | | | |
| Based on the Seminar on Enviro | nmental and Life S | cience I, | this | cours | e will further provide | the students with | n the opportunity | | |
| to study on his/her research sub | ject in environment | tal and lif | te sci | ences | by reading textbook | s and papers unde | r the guidance of | | |
| his/her supervisor. The student | s will learn the kn | owledge | and | the p | resentation skills re | quired for his/her | research in the | | |
| seminar. | | | | | | | | | |
| | | | •••• | | | | | | |
| The students will be required to | read textbooks and | papers | writte | en by | other language than | Japanese, especia | Illy English, which | | |
| are suggested by his/her supervi | sor, and to report a | ind discu | iss de | eply o | on his/her research | subject in the semi | nar. | | |
| Self Preparation and Review | | | | | | | | | |
| | | | | | | | | | |
| Related subjects | | | | | | | | | |
| Seminar on Environmental and Life Science I | | | | | | | | | |
| Thesis Research on Environmental and Life Science | | | | | | | | | |
| All other relevant subjects in Adv | anced Environment | tal and Li | ife Sc | ience | s | | | | |
| Notes for textbook | | | | | | | | | |
| Supervisor will recommend textb | ooks, papers, and re | esearch r | mater | ials to | o students. | | | | |
| Notes for reference | | | | | | | | | |
| | | | | | | | | | |
| Goals to be achieved | | | | | | | | | |
| To acquire basic knowledge on e | ovironmental and lif | e scienci | e c | | | | | | |
| To understand the contents of se | cientific naners in a | given fie | ald of | envir | onmental and life sci | ences | | | |
| To be able to make oral and post | er presentations re | levant to | nane | ers he | /she has read | 611003 | | | |
| Evaluation of achievement | | | pupe | | | | | | |
| The evaluation is based on the | scores of reading t | textbook | s and | scie | ntific naners discus | sions reports and | presentations of | | |
| his/her research in the seminar | His/her supervisor | evaluate | s the | score | | | | | |
| Framination | | evaluate | 3 110 | 30010 | | | | | |
| その他 | | | | | | | | | |
| None during exam period | | | | | | | | | |
| Details of examination | | | | | | | | | |
| | | | | | | | | | |
| 011 1 6 11 | | | | | | | | | |
| Other information | | | | | | | | | |
| Supervisor(s) | | | | | | | | | |
| | | | | | | | | | |
| http://ens.tut.ac.jp/en/ | | | | | | | | | |
| Office hours | | | | | | | | | |
| Students are encouraged visiting | by appointment. | | | | | | | | |
| Relations to attainment objective | es of learning and e | ducation | 1 | | | | | | |
| | | | | | | | | | |
| | | | | | | | | | |
| | | | | | | | | | |
| | | | | | | | | | |
| | | | | | | | | | |
| Key words | | | | | | | | | |
| Environmental science and techn | ology, life science, | materials | s scie | nce a | nd engineering, applie | ed chemistry | | | |

(M44610030)Thesis Research on Environmental and Life Science[Thesis Research on Environmental and Life Science]

| Subject name[English] | Thesis Research on Environmental and Life Science[Thesis Research on Environmental and Life Science] | | | | | | | |
|--|--|-----------------|---|-------------------------|----------|--|--|--|
| Schedule number | M44610030 | Subject area | Advanced Environmental and Life Sciences | Required or elective | Required | | | |
| Time of starting a course | 2Years | Day of the | Intensive | Credit(s) | 6 | | | |
| Faculty | Graduate Program for Master's Degree Subject grade 1~2 | | | | | | | |
| Department Offered | Environmental and | d Life Sciences | Beggining grade | M1, M2 | | | | |
| Charge teacher name[Roman alphabet mark] | S4系教務委員, 4系各教員 4kei kyomu lin-S, 4kei kakukyouin | | | | | | | |
| Numbering | | | | | | | | |

Objectives of class

In the course, the students will perform advanced researches on the environmental and life science under the direction of his/her supervisor in the laboratory. The aims of this lessen are to acquire the knowledge and experimental and analytical skills required for his/her research subject, to learn the scientific and social importance of his/her subject by researching for related studies by others, and to write a Master's Thesis. The students will acquire the skills and capacities of presentation by discussing in the final review of his/her Master's Thesis.

Contents of class

The students are required to have his/her research subject under the direction of his/her supervisor and perform his/her research by acquiring the experimental and analytical skills in the laboratory. The students will be expected to learn the scientific and social background of his/her research subject by collecting and reading the references relating to his/her research. The results from his/her research must be described as a Master's Thesis. The students must also present the results from his/her research, discuss, and answer the questions with the reviewers in the final master's dissertation defense. **Self Preparation and Review**

Related subjects

Seminar on Environmental and Life Science I

Seminar on Environmental and Life Science II

Notes for textbook

Supervisor will recommend textbooks, papers, and research materials to students.

Notes for reference

Goals to be achieved

To acquire basic knowledge on environmental and life sciences

To master experimental techniques and analytical skills required for research on a given field of environmental and life sciences To be able to present and discuss on the results of his/her research

To be able to make safety control in experimental work

Evaluation of achievement

The score of the course is based on his/her Master's Thesis and the presentation in the final review of his/her Master's Thesis (the quality of his/her research, presentation skills, discussions and answering the questions on his/her presentation

etc). Examination

その他

None during exam period

Details of examination

Other information

Supervisor

Reference URL

http://ens.tut.ac.jp/en/ Office hours

Students are encouraged visiting by appointment.

Relations to attainment objectives of learning and education

Key words

Environmental science and technology, life science, materials science and engineering, applied chemistry

(M44610030)Thesis Research on Environmental and Life Science[Thesis Research on Environmental and Life Science]

| Subject name[English] | Thesis Research on Environmental and Life Science[Thesis Research on Environmental and Life Science] | | | | | | | | |
|---------------------------|--|----------------------|---|-------------------------|----------|--|--|--|--|
| Schedule number | M44610030 | Subject area | Advanced Environmental and Life Sciences | Required or elective | Required | | | | |
| Time of starting a course | 2Years | Day of the | Intensive | Credit(s) | 6 | | | | |
| | | week,period | | | | | | | |
| Faculty | Graduate Progran | n for Master's Degre | Subject grade | 1~ | | | | | |
| Department Offered | Environmental and | d Life Sciences | | Beggining | M1. M2 | | | | |
| | grade | | | | | | | | |
| Charge teacher name[Roman | S4系教務委員, 4系各教員 4kei kvomu Iin-S, 4kei kakukvouin | | | | | | | | |
| alphabet mark] | | | | | | | | | |
| Numbering | | | | | | | | | |

Objectives of class

In the course, the students will perform advanced researches on the environmental and life science under the direction of his/her supervisor in the laboratory. The aims of this lessen are to acquire the knowledge and experimental and analytical skills required for his/her research subject, to learn the scientific and social importance of his/her subject by researching for related studies by others, and to write a Master's Thesis. The students will acquire the skills and capacities of presentation by discussing in the final review of his/her Master's Thesis.

Contents of class

The students are required to have his/her research subject under the direction of his/her supervisor and perform his/her research by acquiring the experimental and analytical skills in the laboratory. The students will be expected to learn the scientific and social background of his/her research subject by collecting and reading the references relating to his/her research. The results from his/her research must be described as a Master's Thesis. The students must also present the results from his/her research, discuss, and answer the questions with the reviewers in the final master's dissertation defense. **Self Preparation and Review**

Related subjects

Seminar on Environmental and Life Science I

Seminar on Environmental and Life Science II

Notes for textbook

Supervisor will recommend textbooks, papers, and research materials to students.

Notes for reference

Goals to be achieved

To acquire basic knowledge on environmental and life sciences

To master experimental techniques and analytical skills required for research on a given field of environmental and life sciences To be able to present and discuss on the results of his/her research

To be able to make safety control in experimental work

Evaluation of achievement

The score of the course is based on his/her Master's Thesis and the presentation in the final review of his/her Master's Thesis (the quality of his/her research, presentation skills, discussions and answering the questions on his/her presentation

etc). Examination

その他

None during exam period

Details of examination

Other information

Supervisor

Reference URL

http://ens.tut.ac.jp/en/

Office hours

Students are encouraged visiting by appointment.

Relations to attainment objectives of learning and education

Key words

Environmental science and technology, life science, materials science and engineering, applied chemistry

(M4461003T)Thesis Research on Environmental and Life Science[Thesis Research on Environmental and Life Science]

| Subject name[English] | Thesis Research on Environmental and Life Science[Thesis Research on Environmental and Life Science] | | | | | | | |
|---|--|----------------------|---|-------------------------|----------|--|--|--|
| Schedule number | M4461003T | Subject area | Advanced Environmental and Life Sciences | Required or elective | Required | | | |
| Time of starting a course | Year | Day of the | Intensive | Credit(s) | 6 | | | |
| | | week,period | | | | | | |
| Faculty | Graduate Program | n for Master's Degre | e | Subject grade | 2~ | | | |
| Department Offered | Environmental and | d Life Sciences | | Beggining | M2 | | | |
| - | | | grade | | | | | |
| Charge teacher name[Roman alphabet mark] | S4系教務委員, 4 | 4系各教員 4kei kyor | nu Iin−S, 4kei kakuk | youin | | | | |
| Numbering | | | | | | | | |

Objectives of class

In the course, the students will perform advanced researches on the environmental and life science under the direction of his/her supervisor in the laboratory. The aims of this lessen are to acquire the knowledge and experimental and analytical skills required for his/her research subject, to learn the scientific and social importance of his/her subject by researching for related studies by others, and to write a Master's Thesis. The students will acquire the skills and capacities of presentation by discussing in the final review of his/her Master's Thesis.

Contents of class

The students are required to have his/her research subject under the direction of his/her supervisor and perform his/her research by acquiring the experimental and analytical skills in the laboratory. The students will be expected to learn the scientific and social background of his/her research subject by collecting and reading the references relating to his/her research. The results from his/her research must be described as a Master's Thesis. The students must also present the results from his/her research, discuss, and answer the questions with the reviewers in the final master's dissertation defense. **Self Preparation and Review**

Related subjects

Seminar on Environmental and Life Science I

Seminar on Environmental and Life Science II

Notes for textbook

Supervisor will recommend textbooks, papers, and research materials to students.

Notes for reference

Goals to be achieved

To acquire basic knowledge on environmental and life sciences

To master experimental techniques and analytical skills required for research on a given field of environmental and life sciences To be able to present and discuss on the results of his/her research

To be able to make safety control in experimental work

Evaluation of achievement

The score of the course is based on his/her Master's Thesis and the presentation in the final review of his/her Master's Thesis (the quality of his/her research, presentation skills, discussions and answering the questions on his/her presentation

etc). Examination

その他

None during exam period

Details of examination

Other information

Supervisor(s)

Reference URL

http://ens.tut.ac.jp/en/

Office hours

Students are encouraged visiting by appointment.

Relations to attainment objectives of learning and education

Key words

Environmental science and technology, life science, materials science and engineering, applied chemistry

(M44610040)Seminar on Environmental and Life Science[Seminar on Environmental and Life Science]

| Subject name[English] | Seminar on Envir | onmenta | al and | Life S | cience[Seminar on E | Invironmental and | Life Science] | | | |
|---|---|--------------|--------------|---------|-----------------------|----------------------|-------------------|--|--|--|
| Schedule number | M44610040 | Subje | ct are | a | Advanced | Required or | Required | | | |
| | | | | | Environmental | elective | | | | |
| | | | | | and Life | | | | | |
| | | | | | Sciences | | | | | |
| Time of starting a course | Year | Day week, | of period | the | Intensive | Credit(s) | 6 | | | |
| Faculty | Graduate Program | n for Ma | aster's | Degre | e | Subject grade | 2~ | | | |
| Department Offered | Environmental an | d Life S | Beggining | M2 | | | | | | |
| | grade grade | | | | | | | | | |
| Charge teacher name[Roman | S4糸教務安貝, 4糸谷教貝 4keı kyomu lın−S, 4kei kakukyouin | | | | | | | | | |
| alphabet mark | | | | | | | | | | |
| Numbering | | | | | | | | | | |
| Objectives of class | | | | | | | | | | |
| This course will provide the stu | idents with the op | portunit | y to s | study | on his/her researd | n subject in enviro | onmental and life | | | |
| sciences by reading textbooks a | nd papers under the | e guidan | ce of | his/he | er supervisor. The st | udents will learn th | ne knowledge and | | | |
| the presentation skills required for | the presentation skills required for his/her research in the seminar. | | | | | | | | | |
| Contents of class | | | | | | | | | | |
| The students will be expected | to read textbooks | s and p | apers | writt | en by foreign langu | age that are indic | cated by his/her | | | |
| supervisor, and report and discus | s deeply on his/he | r resear | ch sub | oject i | n the seminar. | | | | | |
| Self Preparation and Review | | | | | | | | | | |
| Related subjects | | | | | | | | | | |
| Thesis Research on Environmental and Life Science | | | | | | | | | | |
| All other relevant subjects in Advanced Environmental and Life Sciences | | | | | | | | | | |
| Notes for textbook | | | | | | | | | | |
| Supervisor will recommend textb | ooks and papers to | student | ts. | | | | | | | |
| Notes for reference | | | | | | | | | | |
| Goals to be achieved | | | | | | | | | | |
| To acquire basic knowledge on e | nvironmental and lif | fe sciend | ces | | | | | | | |
| To understand the contents of se | cientific papers in a | a given fi | ield of | envir | onmental and life sci | ences | | | | |
| To be able to make oral and post | er presentations re | elevant t | o pape | ers he | /she has read. | | | | | |
| Evaluation of achievement | | | | | | | | | | |
| The evaluation is based on the | scores of reading | papers, | discu | ssions | , reports and prese | ntations of his/he | r research in the | | | |
| seminar. His/her supervisor evalu | lates the scores. | | | | | | | | | |
| Examination | | | | | | | | | | |
| その他 | | | | | | | | | | |
| None during exam period | | | | | | | | | | |
| Details of examination | | | | | | | | | | |
| Other information | | | | | | | | | | |
| Supervisor | | | | | | | | | | |
| Reference URL | | | | | | | | | | |
| http://ens.tut.ac.jp/en/ | | | | | | | | | | |
| Office hours | | | | | | | | | | |
| Belations to attainment objecting | by appointment. | ducatio | n | | | | | | | |
| Neiauons to attainment objective | so of loarning and e | JULGATIO | 11 | | | | | | | |
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| Key words | | | | | | | | | | |
| | | | | | | | | | | |

(M44630010)Advanced Separation Chemistry I Advanced Separation Chemistry I

| Subject name[English] | Advanced Separa | Advanced Separation Chemistry I[Advanced Separation Chemistry I] | | | | | | | |
|---------------------------|------------------|--|---------------|-------------|----------|--|--|--|--|
| Schedule number | M44630010 | Subject area | Advanced | Required or | Elective | | | | |
| | | | Environmental | elective | | | | | |
| | | | and Life | | | | | | |
| | | | Sciences | | | | | | |
| Time of starting a course | Fall1 term | Day of the | Mon.3~3 | Credit(s) | 1 | | | | |
| | | week,period | | | | | | | |
| Faculty | Graduate Progran | n for Master's Degre | Subject grade | 1~ | | | | | |
| Department Offered | Environmental an | d Life Sciences | Beggining | M1, M2 | | | | | |
| | | | | | | | | | |
| Charge teacher name[Roman | 齊戸 美弘 SAITO | O Yoshihiro | | | | | | | |
| alphabet mark] | | | | | | | | | |
| Numbering | | | | | | | | | |

Objectives of class

Due to the recent requirements for stationary phases in chromatography such as higher selectivity, various novel stationary phases have been developed by the systematic analysis of the retention behavior of sample solutes. Miniaturization and automation of the whole separation instruments have been regarded as additional important projects in separation science, because of the increasing requirements for recent separation systems, such as selective/specific detection with high sensitivities, high throughput processing, as well as an environmentally-friendly feature of the systems. In this course, novel technologies of sample preparation and chromatographic separations will be provided along with the miniaturization of the hyphenated analytical systems.

Due to the recent requirements for stationary phases in chromatography such as higher selectivity, various novel stationary phases have been developed by the systematic analysis of the retention behavior of sample solutes. Miniaturization and automation of the whole separation instruments have been regarded as additional important projects in separation science, because of the increasing requirements for recent separation systems, such as selective/specific detection with high sensitivities, high throughput processing, as well as an environmentally-friendly feature of the systems. In this course, novel technologies of sample preparation and chromatographic separations will be provided along with the miniaturization of the hyphenated analytical systems.

Contents of class

1. Development of novel stationary phases in liquid chromatography based on the systematic analysis of retention behavior.

2. Development of novel sample preparation media and the applications to real sample analysis in various chromatographic methods.

3. Miniaturization of analytical systems and the hyphenation.

1. Development of novel stationary phases in liquid chromatography based on the systematic analysis of retention behavior.

2. Development of novel sample preparation media and the applications to real sample analysis in various chromatographic methods.

3. Miniaturization of analytical systems and the hyphenation.

Self Preparation and Review

Related subjects

Advanced Separation Chemistry II.

Advanced Separation Chemistry II.

Notes for textbook

No text book is required, however, basic knowledge of chromatography is desirable.

No text book is required, however, basic knowledge of chromatography is desirable.

Notes for reference

Goals to be achieved

Evaluation of achievement

The evaluation will be made based on the score of the report and presentation. The evaluation will be made based on the score of the report and presentation. **Examination**

レポートで実施

By Report

Details of examination

Other information

Y. Saito; Room# B-404; Phone 6803; E-mail: saito@ens.tut.ac.jp Y. Saito; Room# B-404; Phone 6803; E-mail: saito@ens.tut.ac.jp **Reference URL**

Office hours

Anytime if available, however, an appointment by e-mail is strongly recommended. Anytime if available, however, an appointment by e-mail is strongly recommended. **Relations to attainment objectives of learning and education**

Key words

(M44630020)Advanced Separation Chemistry II[Advanced Separation Chemistry II]

| Schedule number | M44630020 | Subject area | Advanced | Beguired or | | |
|--|--|-------------------------------------|--------------------------|---|-------------------|--|
| | | M44630020 Subject area Advanced | | | | |
| | | | Environmental and | elective | | |
| | | | Life Sciences | | | |
| Time of starting a | Fall2 term | Day of the | Mon.3~3 | Credit(s) | 1 | |
| course | | week,period | | | | |
| Faculty | Graduate Program for Master's [| Subject | 1~ | | | |
| | | grade | | | | |
| Department Offered | Environmental and Life Sciences | Environmental and Life Sciences | | | | |
| | | | | grade | | |
| Charge teacher | 平田 幸夫 HIRATA Yukio | | | | | |
| name[Roman alphabet | | | | | | |
| mark] | | | | | | |
| Numbering | | | | | | |
| Time of starting a course Faculty Department Offered Charge teacher name[Roman alphabet mark] Numbering | Fall2 term Graduate Program for Master's [Environmental and Life Sciences 平田 幸夫 HIRATA Yukio | Day of the week,period Degree | Life Sciences Mon.3~3 | Credit(s) Subject grade Beggining grade | 1 1~ M1, M2 | |

Objectives of class

Chromatography is one of the most widely applied methods for the analysis of mixtures, because of its high resolving power. Purpose of this course is to learn the basic theory of chromatography. To obtain the in-depth understanding, the emphasis is also placed on practice and reports on the related topics.

Chromatography is one of the most widely applied methods for the analysis of mixtures, because of its high resolving power. Purpose of this course is to learn the basic theory of chromatography. To obtain the in-depth understanding, the emphasis is also placed on practice and reports on the related topics.

Contents of class

- 1. Basic theory of chromatography
- distribution equilibrium
- plate theory
- rate theory
- resolution
- mobile and stationary phases
- 2. Practice and Repots for various simulation using Excel and Excel-VBA
- chromatographic separation process
- effect of various parameters on the separation efficiency
- effect of temperature in GC
- effect of mobile phase composition in LC
- analysis of chromatographic data
- 1. Basic theory of chromatography
- distribution equilibrium
- plate theory
- rate theory
- resolution
- mobile and stationary phases
- 2. Practice and Repots for various simulation using Excel and Excel-VBA
- chromatographic separation process
- effect of various parameters on the separation efficiency
- effect of temperature in GC
- effect of mobile phase composition in LC
- analysis of chromatographic data

Self Preparation and Review

Related subjects

Notes for textbook

Textbook

No textbook is required. Related materials will be provided. Elementary knowledge of Basic Language is required to use Excel-VBA.

Textbook

| Reference 1 | Book title | Chromatograph | ny: Concepts and | Contrasts | | | ISBN | |
|----------------------------------|----------------------|--------------------|---------------------|--------------|-----------|--------|--------------|--|
| | Author | J. M. Miller | Publisher | John Sons | Wiley | & | Publish year | |
| Notes for reference | • | | · | | | | · | |
| Goals to be achieve | ed | | | | | | | |
| To undersatnd the | principle of chroma | tography. | | | | | | |
| To undersatnd the | principle of chroma | tography. | | | | | | |
| Evaluation of achie | vement | | | | | | | |
| Based on reports re | equested on individ | ual chromatograph | nic topic of intere | st during tl | ne course | e of o | class. | |
| | | | | | | | | |
| Based on reports re | equested on individ | ual chromatograph | nic topic of intere | st during tl | ne course | e of o | class. | |
| Examination | | | | | | | | |
| レホートで美施 By Report | | | | | | | | |
| Details of examinat | ion | | | | | | | |
| | | | | | | | | |
| Other information | / | | | | | | | |
| Yukio Hirata: room | (B-402), e-mail (hir | ata@ens.tut.ac.jp) | , phone: 6804 | | | | | |
| Yukio Hirata: room | (B-402), e-mail (hir | ata@ens.tut.ac.jp) | , phone: 6804 | | | | | |
| Reference URL | | | | | | | | |
| Office hours | | | | | | | | |
| As needed. | | | | | | | | |
| As needed. | | | | | | | | |
| s needed. elations to attainr | nent objectives of | earning and educ | ation | | | | | |
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(M44630070)Advanced Polymer Chemistry[Advanced Polymer Chemistry]

| Schedule number M44630070 Subject area Advanced Environmental and Life Required elective Celective Time of starting a course Fall1 term Day of the weekparied Thu.3~3 Credit(s) 1 Faculty Graduate Program for Master's Degree Subject grade 1~ Department Offered Environmental and Life Sciences Beggining grade M1. M2 Charge teacher name[Roman alphabet mark] ##野 真一, 原口 直樹 ITSUNO Shinichi, HARAGUCHI Naoki alphabet mark] M1. M2 Numbering Several applications of solid-supported orga chemistry will be discussed. This course focuses on the synthetic aspects of polymer-supported chemistry. Several applications of solid-supported orga chemistry will be discussed. Solid-supported orga Contents of class (1) Preparation of functionalized monomers (2) Preparation of functional polymer support (3) Preparation of functional polymers by polymer reaction method (4) Preparation of functional polymers (2) Preparation of functional polymers (2) Preparation of functional polymers by polymer (3) Preparation of functional polymers by polymer reaction method (4) Preparation of functional polymers (2) Preparation of functional polymers by polymer (3) Preparati | Subject name[English] | Advanced Polvm | ner Chemist | rv[Adva | nced Polymer Chemi | strv] | | | | |
|--|-------------------------------------|---------------------|--------------|----------|----------------------|-----------------------|-------------------|--|--|--|
| Image: Control of the second secon | Schedule number | M44630070 | Subject | area | Advanced | Required or | Elective | | | |
| Ime of starting a course Fall1 term Day of the Thu.3~3 Credit(s) 1 Faculty Graduate Program for Master's Degree Subject grade 1~ Department Offered Environmental and Life Sciences Beggining grade 1/ Charge teacher name[Roman alphabet mark] 伊津野 真一,原口 直樹 ITSUNO Shinichi, HARAGUCHI Naoki alphabet mark] Mumbering Objectives of class This course focuses on the synthetic aspects of polymer-supported chemistry. Several applications of solid-supported orga chemistry will be discussed. This course focuses on the synthetic aspects of polymer-supported chemistry. Several applications of solid-supported orga chemistry will be discussed. Contents of class (1) Preparation of functionalized monomers (2) Preparation of functional polymers by polymer reaction method (4) Preparation of functional polymers by polymer reaction method (5) Nucleophilic reactions on the functional polymers (7) Polymer-supported catalysts (8) Polymer-supported catalysts (9) Asymmetric reaction using polymer-supported catalyst (10) Solid phase peptide synthesis | | | | | Environmental | elective | | | | |
| Time of starting a course Fall1 term Day of the week,period Thu.3~3 Credit(s) 1 Faculty Graduate Program for Master's Degree Subject grade 1~ Department Offered Environmental and Life Sciences Beggining grade M1. M2 Charge teacher name[Roman alphabet mark] 伊津野 真一,原口 直樹 ITSUNO Shinichi, HARAGUCHI Naoki alphabet mark] Numbering Objectives of class This course focuses on the synthetic aspects of polymer-supported chemistry. Several applications of solid-supported orga chemistry will be discussed. This course focuses on the synthetic aspects of polymer-supported chemistry. Several applications of solid-supported orga chemistry will be discussed. Contents of class (1) Preparation of functionalized monomers (2) Preparation of functional polymer support (3) Preparation of functional polymers by polymer reaction method (4) Preparation of functional polymers by polymer (5) Nucleophilic reactions on the functional polymers (5) Nucleophilic reactions on the functional polymers (2) Preparation of functional polymer (3) Preparation of functional polymer supported catalysts (3) Polymer-supported reagents (3) Polymer-supported catalysts (3) Polymer-supported catalysts (3) Asymmetric reaction using polymer-supported catalysts (3) Asymmetric reaction using polymer-supported catalyst (3) Solid phase peptide syn | | | | | and Life | | | | | |
| Time of starting a course Fall1 term Day of the week,period Thu.3~3 Credit(s) 1 Faculty Graduate Program for Master's Degree Subject grade 1~ Department Offered Environmental and Life Sciences Beggining grade 11~ Charge teacher name[Roman alphabet mark] (##野 真一,原口 直樹 ITSUNO Shinichi, HARAGUCHI Naoki 1 Numbering Objectives of class This course focuses on the synthetic aspects of polymer-supported chemistry. Several applications of solid-supported orga chemistry will be discussed. This course focuses on the synthetic aspects of polymer-supported chemistry. Several applications of solid-supported orga chemistry will be discussed. Solid Proparation of solid-supported orga chemistry of functionalized monomers (2) Preparation of functionalized monomers (2) Preparation of functional polymer support Solid Proparation polymer supported chemistry. Several applications of solid-supported orga chemistry will be discussed. (3) Preparation of functional polymers by polymer reaction method (4) Preparation of functional polymers by polymer reaction method (5) Nucleophilic reactions on the functional polymers (5) Dupereprint reaction using polymer-supported catalyst (8) Polymer-supported catalysts (9) Asymmetric reaction using polymer-supported catalyst (9) Asymmetric reaction using polymer-suport (9) R | | | | | Sciences | | | | | |
| week,period Subject grade 1~ Department Offered Environmental and Life Sciences Beggining grade M1, M2 Charge teacher name[Roman alphabet mark] 伊津野 真一,原口 直樹 ITSUNO Shinichi, HARAGUCHI Naoki M1, M2 Numbering Objectives of class Subject grade M1, M2 This course focuses on the synthetic aspects of polymer-supported chemistry. Several applications of solid-supported orga chemistry will be discussed. This course focuses on the synthetic aspects of polymer-supported chemistry. Several applications of solid-supported orga chemistry will be discussed. Contents of class (1) Preparation of functionalized monomers (2) Preparation of functional polymers by polymer reaction method (3) Preparation of functional polymers by polymer reaction method (4) Preparation of functional polymers by polymers (5) Nucleophilic reactions on the functional polymers (7) Polymer-supported reagents (8) Polymer-supported reagents (8) Polymeric reaction using polymer-supported catalysts (9) Asymmetric reaction using polymer-supported catalysts (9) Asymmetric reaction using polymer-supported catalyst (1) Preparation of functionalized monomers (2) Preparation of functionalized monomers (2) Preparation of functional polymer-supported catalyst | Time of starting a course | Fall1 term | Dav o | of the | Thu.3~3 | Credit(s) | 1 | | | |
| Faculty Graduate Program for Master's Degree Subject grade 1~ Department Offered Environmental and Life Sciences Beggining grade M1, M2 Charge teacher name[Roman alphabet mark] 伊津野 真一,原口 直樹 ITSUNO Shinichi, HARAGUCHI Naoki Boggining M1, M2 Numbering Dijectives of class This course focuses on the synthetic aspects of polymer-supported chemistry. Several applications of solid-supported orga chemistry will be discussed. This course focuses on the synthetic aspects of polymer-supported chemistry. Several applications of solid-supported orga chemistry will be discussed. Contents of class (1) Preparation of functionalized monomers (2) Preparation of functional polymers by polymer reaction method (4) Preparation of functional polymers by polymer/support (3) Preparation of functional polymers by polymerization method (5) Nucleophilic reactions on the functional polymers (4) Preparation of functional polymers by polymerization method (5) Nucleophilic reactions on the functional polymers (7) Polymer-supported catalysts (9) Asymmetric reaction using polymer-supported catalyst (10) Solid phase peptide synthesis (1) Preparation of functionalized monomers (2) Preparation of functionalized monomers (2) Preparation of functionalized monomers | | | week,pe | riod | | | | | | |
| Department Offered Environmental and Life Sciences Beggining grade M1, M2 Charge teacher name[Roman alphabet mark] 伊津野 真一, 原口 直樹 ITSUNO Shinichi, HARAGUCHI Naoki Intervention Numbering Objectives of class Discription Intervention Intervention Objectives of class This course focuses on the synthetic aspects of polymer-supported chemistry. Several applications of solid-supported orgation Intervention Intervention This course focuses on the synthetic aspects of polymer-supported chemistry. Several applications of solid-supported orgation Intervention Intervention Contents of class Intervention Intervention Intervention Intervention (1) Preparation of functional polymer support Intervention Intervention Intervention Intervention (3) Preparation of functional polymers by polymer reaction method Intervention Interven | Faculty | Graduate Progra | m for Mast | er's Deg | ree | Subject grade | 1~ | | | |
| grade Charge teacher name[Roman alphabot mark] 伊津野 真一,原口 直樹 ITSUNO Shinichi, HARAGUCHI Naoki alphabot mark] Numbering Objectives of class This course focuses on the synthetic aspects of polymer-supported chemistry. Several applications of solid-supported orga chemistry will be discussed. This course focuses on the synthetic aspects of polymer-supported chemistry. Several applications of solid-supported orga chemistry will be discussed. Contents of class (1) Preparation of functionalized monomers (2) Preparation of functional polymer-support (3) Preparation of functional polymers by polymer reaction method (4) Preparation of functional polymers by polymerization method (5) Nucleophilic reactions on the functional polymer (6) Electrophilic reactions on the functional polymers (7) Polymer-supported catalysts (8) Polymer-supported catalysts (9) Asymmetric reaction using polymer-supported catalyst (10) Solid phase peptide synthesis (11) Preparation of functionalized monomers (22) Preparation of functionalized monomers (33) Reparation of functional polymer-supported catalysts (34) Preparation of functional polymers (15) Nucleophilic reactions on the functional polymer (35) Polymer-supported catalysts (36) Asymmetric reacti | Department Offered | Environmental a | nd Life Scie | ences | | Beggining | M1, M2 | | | |
| Charge teacher name[Roman alphabet mark] 伊津野 真一,原口 直樹 ITSUNO Shinichi, HARAGUCHI Naoki Numbering Objectives of class This course focuses on the synthetic aspects of polymer-supported chemistry. Several applications of solid-supported orga chemistry will be discussed. This course focuses on the synthetic aspects of polymer-supported chemistry. Several applications of solid-supported orga chemistry will be discussed. Contents of class (1) Preparation of functionalized monomers (2) Preparation of functional polymer-support (3) Preparation of functional polymers by polymer reaction method (4) Preparation of functional polymers by polymer reaction method (5) Nucleophilic reactions on the functional polymer (6) Electrophilic reactions on the functional polymers (7) Polymer-supported reagents (8) Polymer-supported reagents (9) Asymmetric reaction using polymer-supported catalyst (10) Solid phase peptide synthesis (1) Preparation of functionalized monomers (2) Preparation of functionalized monomers (3) Asymmetric reaction using polymer-supported catalyst (10) Solid phase peptide synthesis | • | | | grade | | | | | | |
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| (3) Preparation of functional polymers by polymer reaction method | (3) Preparation of functional poly | mers by polymer r | eaction met | thod | | | | | | |
| (4) Preparation of functional polymers by polymerization method | (4) Preparation of functional poly | mers by polymeriz | ation metho | od | | | | | | |
| (5) Nucleophilic reactions on the functional polymer | (5) Nucleophilic reactions on the | functional polyme | r | | | | | | | |
| (6) Electrophhilic reactions on the functional polymers | (6) Electrophhilic reactions on the | e functional polym | ers | | | | | | | |
| (7) Polymer-supported reagents | (7) Polymer-supported reagents | | | | | | | | | |
| (8) Polymer-supported catalysts | (8) Polymer-supported catalysts | | | | | | | | | |
| (9) Asymmetric reaction using polymer-supported catalyst | (9) Asymmetric reaction using po | lymer-supported o | catalyst | | | | | | | |
| (10) Solid phase peptide synthesis | (10) Solid phase peptide synthe | esis | | | | | | | | |
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| Self Preparation and Review | Self Preparation and Review | | | | | | | | | |
| | - | | | | | | | | | |
| Related subjects | Related subjects | | | | | | | | | |
| Organic Chamietry | Arganic Chemistry | | | | | | | | | |
| Polymer chemistry | Polymer chemistry | | | | | | | | | |
| Organic Chemistry | Organic Chemistry | | | | | | | | | |
| Polymer chemistry | Polymer chemistry | | | | | | | | | |
| Notes for textbook | Notes for textbook | | | | | | | | | |
| No taxtbook will be used | No textbook will be used | | | | | | | | | |
| No textbook will be used. | No textbook will be used. | | | | | | | | | |
| Notes for reference | Notes for reference | | | | | | | | | |
| | | | | | | | | | | |
| | | | | | | | | | | |
| Goals to be achieved | Goals to be achieved | | | | | | | | | |
| 1)To understand radical polymerization of vinyl monomers | 1)To understand radical polymer | ization of vinyl mo | nomers | | | | | | | |

2)To understand reactions of polymers

3)To understand the synthesis of optically active polymers

4)To understand the structure formation of peptides and proteins

1) To understand radical polymerization of vinyl monomers

2)To understand reactions of polymers

3)To understand the synthesis of optically active polymers

4) To understand the structure formation of peptides and proteins

Evaluation of achievement

The report on selected topics will be imposed.

The report on selected topics will be imposed.

Examination

レポートで実施 By R<u>eport</u>

Details of examination

Other information

B-502 6813 itsuno@ens.tut.ac.jp

B−403 6812

haraguchi@ens.tut.ac.jp

B-502 6813 itsuno@ens.tut.ac.jp

B-403

6812 haraguchi@ens.tut.ac.jp

Reference URL

http://ens.tut.ac.jp/chiral/index.html http://ens.tut.ac.jp/chiral/index.html

Office hours Any time

Any time

Relations to attainment objectives of learning and education

Key words

Polymer reaction, Optically active polymers, Polymeric catalyst, Asymmetric reactions, Peptide Polymer reaction, Optically active polymers, Polymeric catalyst, Asymmetric reactions, Peptide

(M44630080)Advanced Polymer Engineering[Advanced Polymer Engineering]

| Subject name[English] | Advanced Polyme | er Engineering[Adva | nced Polymer Engine | ering] | | | | |
|-----------------------------------|---------------------|---------------------------|---------------------|---------------|----------|--|--|--|
| Schedule number | M44630080 | Subject area | Advanced | Required or | Elective | | | |
| | | | Environmental | elective | | | | |
| | | | and Life | | | | | |
| | | | Sciences | | | | | |
| Time of starting a course | Fall2 term | Day of the week,period | Tue.2~2 | Credit(s) | 1 | | | |
| Faculty | Graduate Progran | n for Master's Degr | ee | Subject grade | 1~ | | | |
| Department Offered | Environmental and | d Life Sciences | Beggining | M1, M2 | | | | |
| | | grade | | | | | | |
| Charge teacher name[Roman | 吉田 絵里 YOSH | IIDA Eri | | | | | | |
| alphabet mark | | | | | | | | |
| Numbering | | | | | | | | |
| Objectives of class | | | | | | | | |
| Contents of class | | | | | | | | |
| Self Preparation and Review | | | | | | | | |
| Related subjects | | | | | | | | |
| Notes for textbook | | | | | | | | |
| Notes for reference | | | | | | | | |
| Goals to be achieved | | | | | | | | |
| Evaluation of achievement | | | | | | | | |
| Examination | | | | | | | | |
| Details of examination | | | | | | | | |
| Other information | | | | | | | | |
| Reference URL | | | | | | | | |
| Office hours | | | | | | | | |
| Relations to attainment objective | s of learning and e | ducation | | | | | | |
| Key words | | | | | | | | |

(M44630120)Advanced Molecular Life Science[Advanced Molecular Life Science]

| Subject name[English] | Advanced Molecu | ılar Life | Scien | ce[Ad | vanced Molecular Lif | e Science] | | | | |
|--|------------------------|--|---------|---------------|-----------------------|--------------------|--------------------|--|--|--|
| | M44630120 | Subie | ct are | a | Advanced | Required or | Elective | | | |
| | Envi | | | Environmental | elective | | | | | |
| | | | | | and Life | | | | | |
| | | | | | Sciences | | | | | |
| Time of starting a course | Fall1 term | Day | of | the | Thu.2~2 | Credit(s) | 1 | | | |
| | | week, | period | | | | | | | |
| Faculty | Graduate Progran | n for Ma | ister's | Degre | ee | Subject grade | 1~ | | | |
| Department Offered | Environmental an | d Life So | cience | es | | Beggining | M1, M2 | | | |
| | | | | | | grade | | | | |
| Charge teacher name[Roman | 田中 照通, 梅影 | 丑中 照通, 梅影 創 TANAKA Terumichi, UMEKAGE So | | | | | | | | |
| alphabet mark | | | | | | | | | | |
| Numbering | | | | | | | | | | |
| Objectives of class | | | | | | | | | | |
| This course will provide students with the opportunity to read recent important research papers on RNA engineering. | | | | | | | | | | |
| Therefore, the knowledge of bas | ic biotechnology, bi | iochemis | stry a | nd mo | lecular biology is ab | solutely necessary | . If you have not | | | |
| completed these subjects, you a | re NOT qualified for | r this co | urse. | The s | tudents will be requi | red to read, summ | arize and present | | | |
| two or more research papers. Th | e number of resear | ch papei | rs sho | uld be | presented will be d | ecided by number o | of students. | | | |
| This course will provide studer | nts with the oppo | rtunity | to rea | ad red | cent important rese | earch papers on I | RNA engineering. | | | |
| Therefore, the knowledge of bas | ic biotechnology, bi | iochemis | stry a | nd mo | lecular biology is ab | solutely necessary | . If you have not | | | |
| completed these subjects, you a | re NOT qualified for | r this co | urse. | The s | tudents will be requi | red to read, summ | arize and present | | | |
| two or more research papers. Th | e number of resear | ch papei | rs sho | uld be | presented will be d | ecided by number o | of students. | | | |
| Contents of class | | | | | | | | | | |
| This Class goes with the "Original Papers" of the recent RNA engineering published in the Nucleic Acids Research. At first, | | | | | | | | | | |
| students must access the HP of Nucleic Acids Research: http://nar.oxfordjournals.org/. | | | | | | | | | | |
| Next, pick two or more good rese | earch papers publish | ned after | r 2014 | in th | e Nucleic Acids Rese | earch. | | | | |
| After that, every student will giv | e a presentation o | f the ch | iosen | paper | . Students will be gi | ven 20 min for the | e presentation. In | | | |
| that duration, the student must e | explain plainly, but t | hrougho | ut the | nove | ty of the research. | | | | | |
| This Class goes with the "Original Papers" of the recent RNA engineering published in the Nucleic Acids Research. At first, students must access the HP of Nucleic Acids Research: http://nar.oxfordjournals.org/. Next, pick two or more good research papers published after 2014 in the Nucleic Acids Research. After that, every student will give a presentation of the chosen paper. Students will be given 20 min for the presentation. In that duration, the student must explain plainly, but throughout the novelty of the research. | | | | | | | | | | |
| Self Preparation and Review | | | | | | | | | | |
| . | | | | | | | | | | |
| Related subjects | | | | | | | | | | |
| Biotechnology, molecular biology | | | | | | | | | | |
| Biotechnology, molecular biology | | | | | | | | | | |
| Notes for textbook | | | | | | | | | | |
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| Notes for reference | | | | | | | | | | |
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| To understand cutting-edge block | achnology based on | | Iginee | ring. | | | | | | |
| Evaluation of appiavement | echnology based on | | Iginee | ning. | | | | | | |
| Presentation (100%) | | | | | | | | | | |
| Presentation (100%) | | | | | | | | | | |
| Examination | | | | | | | | | | |
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| Other | | | | | | | | | | |
| Details of examination | | | | | | | | | | |
| | | | | | | | | | | |
| Other information | | | | | | | | | | |
| So Umekage: ex.5832, umekage@ | ens.tut.ac.jp, G1-20 |)1 | | | | | | | | |

So Umekage: ex.5832, umekage@ens.tut.ac.jp, G1-201 Reference URL

Office hours

Please make an appointment. Please make an appointment.

Relations to attainment objectives of learning and education

Key words

RNA, biotechnology, molecular biology RNA, biotechnology, molecular biology

(M44630130)Advanced Applied Biochemistry and Biotechnology[Advanced Applied Biochemistry and Biotechnology]

| Subject name[English] | Advanced Appli | ed Biochemist | try an | d Biotechnology[Ad | vanced Applied | Biochemistry and | | | | |
|---|--|---|--|--|--|-------------------|--|--|--|--|
| | Biotechnology] | | | | | | | | | |
| Schedule number | M44630130 | Subject are | 8 | Advanced Environmental and Life Sciences | Required or elective | Elective | | | | |
| Time of starting a course | Fall2 term | Day of week,period | Credit(s) | 1 | | | | | | |
| Faculty | Graduate Progra | Graduate Program for Master's Degree Subject grade 1~ | | | | | | | | |
| Department Offered | Environmental and Life Sciences Beggining M1, M2 grade | | | | | | | | | |
| Charge teacher name[Roman alphabet mark] | 平石 明, 浴 俊彦 HIRAISHI Akira, EKI Toshihiko | | | | | | | | | |
| Numbering | | | | | | | | | | |
| Objectives of class | | | | | | | | | | |
| Applied Microbiology and B fermentation technology and envi 2. Molecular Biology and Genomic 1. Applied Microbiology and B fermentation technology and Genomic 2. Molecular Biology and Genomic Contents of class Applied Microbiology and Bioch 1) Introduction of microbiology – Fundamentals of bioenergetics 3) Modes of microbial energy-yie 4) Industrial microbiology and Genomic 1) Introduction of genome resear Molecular Biology and Genomics Applied Microbiology and Bioch 1) Introduction of genome resear Mapping and Sequencing techn 3) Functional genomics Applied Microbiology and Bioch 1) Introduction of microbiology - Fundamentals of bioenergetics Modes of microbial energy-yie Industrial microbiology and Genomic Industrial microbiology and Genomic Introduction of genome resear Molecular Biology and Genomic | iochemistry: Fun ironmental biotech s: Principle and c iochemistry: Fun ironmental biotech s: Principle and c iochemistry Biodiversity, taxon ding systems ch nology memistry Biodiversity, taxon ding systems vironmental biotec s ch nology | damentals of inclogy urrent progress damentals of inclogy urrent progress homy and physi hnology | micro s in ge <u>s in ge</u> iology | biology and bioene nome sciences will b biology and bioene <u>nome sciences will b</u> of microorganisms | rgetics and thei be discussed. rgetics and thei be discussed. | r applications to | | | | |
| 3) Functional genomics | | | | | | | | | | |
| Self Preparation and Review | | | | | | | | | | |
| Related subjects The knowledge of basic microbiol The knowledge of basic microbiol Notes for textbook For Applied Microbiology and Bio M. T. Madigan et al."Brock Biolog For Molecular Biology and Genon S. B. Primrose and R. M. Twyman | ogy, biochemistry ogy, biochemistry chemistry: ry of Microorganisu nics "Principles of Ge | and molecular and molecular ms" Prentice H mome Analysis | biolog biolog łall and C | y is absolutely requir y is absolutely requir ienomics" 3rd Ed. Bl | red. red. lackwell Science | | | | | |
| For Applied Microbiology and Bio M. T. Madigan et al."Brock Biolog For Molecular Biology and Genon S. B. Primrose and R. M. Twyman Notes for reference | chemistry: y of Microorganismics nics ı "Principles of Ge | ms" Prentice H mome Analysis | lall and C | ienomics" 3rd Ed. Bl | ackwell Science | | | | | |
| Goals to be achieved | | | | | | | | | | |
| The aims of the lesson are to ge | t basic knowledge | e of applied mid | crobiol | ogy, genomics and n | nolecular biology a | and to understand | | | | |

| the current technology in the field of these researches. | | | | | |
|---|--|--|--|--|--|
| The aims of the lesson are to get basic knowledge of applied microbiology, genomics and molecular biology and to understand | | | | | |
| the current technology in the field of these researches. | | | | | |
| Evaluation of achievement | | | | | |
| Grades for the course will be based on the average of the subjects score (Hiraishi and Eki). | | | | | |
| Interim report (30%) and term-end report (70%) for Applied Microbiology and Biochemistry (Hiraishi). | | | | | |
| Presentation (30%) and term-end report (70%) for Molecular Biology and Genomics (Eki). | | | | | |
| Grades for the course will be based on the average of the subjects score (Hiraishi and Eki). | | | | | |
| Interim report (30%) and term-end report (70%) for Applied Microbiology and Biochemistry (Hiraishi). | | | | | |
| Presentation (30%) and term-end report (70%) for Molecular Biology and Genomics (Eki). | | | | | |
| Examination | | | | | |
| 試験期間中には何も行わない | | | | | |
| None during exam period | | | | | |
| Details of examination | | | | | |
| | | | | | |
| Other information | | | | | |
| Prof. Akira Hiraishi (G503) Tel: 6913, e-mail: hiraishi@ens.tut.ac.jp | | | | | |
| Prof. Toshihiko Eki (G505) Tel: 6907, e−mail: eki@ens.tut.ac.jp | | | | | |
| Prof. Akira Hiraishi (G503) Tel: 6913, e−mail: hiraishi@ens.tut.ac.jp | | | | | |
| Prof. Toshihiko Eki (G505) Tel: 6907, e−mail: eki@ens.tut.ac.jp | | | | | |
| Reference URL | | | | | |
| | | | | | |
| Office hours | | | | | |
| Please make an appointment. | | | | | |
| Please make an appointment. | | | | | |
| Relations to attainment objectives of learning and education | | | | | |
| | | | | | |
| | | | | | |
| | | | | | |
| | | | | | |
| | | | | | |
| Key words | | | | | |
| microbiology, applied biochemistry, molecular biology, genomics | | | | | |
| microbiology, applied biochemistry, molecular biology, genomics | | | | | |

(M44630210)Advanced Life Science and Biotechnology I[Advanced Life Science and Biotechnology I]

| Subject name[English] | Advanced Life Science and Biotechnology I[Advanced Life Science and Biotechnology I] | | | | | |
|--|--|---------------------------|-----------------|---------------|----------|--|
| Schedule number | M44630210 | Subject area | Advanced | Required or | Elective | |
| | | | Environmental | elective | | |
| | | | and Life | | | |
| | | | Sciences | | | |
| Time of starting a course | Fall term | Day of the week,period | Intensive | Credit(s) | 2 | |
| Faculty | Graduate Program for Master's Degree | | | Subject grade | 1~ | |
| Department Offered | Environmental and Life Sciences | | | Beggining | M1, M2 | |
| | | | | grade | | |
| Charge teacher name[Roman alphabet mark] | S4系教務委員 4kei kyomu Iin-S | | | | | |
| Numbering | | | | | | |
| Objectives of class | | | | | | |
| This course will provide the students with the opportunity to study on selected subjects in the realm of advanced life science and biotechnology. | | | | | | |
| This course will provide the students with the opportunity to study on selected subjects in the realm of advanced life science and biotechnology. | | | | | | |
| Contents of class | | | | | | |
| The classes will be given by his/her supervisor. The students will be required to read textbooks and papers but the type and | | | | | | |
| contents of this course depend on his/her supervisor. | | | | | | |
| The classes will be given by his/her supervisor. The students will be required to read textbooks and papers but the type and contents of this course depend on his/her supervisor. | | | | | | |
| Self Preparation and Review | | | | | | |
| Related subjects | | | | | | |
| Advanced Life Science and Biotechnology II | | | | | | |
| Advanced Life Science and Biotechnology II | | | | | | |
| | | | | | | |
| Supervisor will recommend textb | boks and papers | lo students. | | | | |
| Supervisor will recommend textbooks and papers to students. | | | | | | |
| Notes for reference | | | | | | |
| Goals to be achieved | | | | | | |
| To acquire advanced knowledge on life science and biotechnology | | | | | | |
| To be able to report and discuss | the contents of t | extbooks and naners | he/she has read | | | |
| | | | | | | |
| To acquire advanced knowledge on life science and biotechnology | | | | | | |
| To be able to report and discuss the contents of textbooks and papers he/she has read | | | | | | |
| | | | | | | |
| Evaluation of achievement | | | | | | |
| The evaluation is based on the scores of reports presentations, and examination | | | | | | |
| The evaluation is based on the scores of reports, presentations, and examination. | | | | | | |
| Free evaluation is based on the scores of reports, presentations, and examination. | | | | | | |
| 試験期間中には何も行わない | | | | | | |
| None during exam period | | | | | | |
| Details of examination | | | | | | |
| Other information | | | | | | |
| | | | | | | |
| Supervisor | | | | | | |

Supervisor

Reference URL

Office hours

Students are encouraged visiting by appointment.

Students are encouraged visiting by appointment.

Relations to attainment objectives of learning and education

Key words

 $\label{eq:life_science_science} \mbox{Life_science, biotechnology, bioengineering, molecular biology, microbiology, genomics}$

Life science, biotechnology, bioengineering, molecular biology, microbiology, genomics
(M44630230)Advanced Environmental Technology I[Advanced Environmental Technology I]

| Subject name[English] | Advanced Enviror | nmental Techi | nologv | I[Advanced Environ | mental Technology | 1] |
|--|----------------------|----------------|---------|------------------------|--------------------|------------------|
| Schedule number | M44630230 | Subject are | A | Advanced | Required or | Flective |
| | 1111000200 | Cubject all | | Environmental | elective | LICOLIVE |
| | | | | and Life | 01000140 | |
| | | | | Solonooo | | |
| Time of starting a summer | E all da una | Dava of | 44 | Sciences | 0 | 0 |
| lime of starting a course | Fail term | Day of | the . | Intensive | Great(s) | 2 |
| F 11 | | week,period | 1 | | 0.1 | 1 |
| Faculty | Graduate Program | n for Master s | Degr | ee | Subject grade | ~ ₩.₩ |
| Department Offered | Environmental an | d Life Science | es | | Beggining | M1, M2 |
| | 。 <i></i> | | | | grade | |
| Charge teacher name Roman | 54 杀 教 務 安 貝 4 | kei kyomu lin- | -8 | | | |
| alphabet mark | | | | | | |
| Numbering | | | | | | |
| Objectives of class | | | | | | |
| This course will provide the st | tudents with the c | pportunity to | stud | v on the selected | subject in the rea | alm of advanced |
| environmental science and techn | nology | | | , | j | |
| This course will provide the st | tudents with the c | opportunity to | hute d | v on the selected | subject in the rea | alm of advanced |
| environmental science and techn | | | | , | | |
| Contents of class | юю бу . | | | | | |
| The places will be given by his | her cupersions Th | a studente …i | ll ha " | aquired to road tout | books and none | but the time and |
| ante classes will be given by his | mer supervisor. In | e students Wi | n be r | equired to read text | books and papers | but the type and |
| contents of this course depend of | on his/her supervise | or. | | | | |
| The classes will be given by his | her supervisor. Th | e students wi | ll be r | equired to read text | books and papers | but the type and |
| contents of this course depend of | on his/her supervise | or. | | | | |
| Self Preparation and Review | | | | | | |
| | | | | | | |
| Related subjects | | | | | | |
| Advanced Environmental Techno | logy II | | | | | |
| Advanced Environmental Techno | logy II | | | | | |
| Notes for textbook | | | | | | |
| Supervisor will recommend textb | ooks and papers to | students | | | | |
| Supervisor will recommend texts | ooks and papers to | students | | | | |
| Notes for reference | | | | | | |
| | | | | | | |
| Goals to be achieved | | | | | | |
| | an an deservatel a | tion on and to | ماممام | | | |
| To acquire advanced knowledge | | cience and Leo | snnoio | gy ha /aha haa waad | | |
| To be able to report and discuss | the contents of te | xtbooks and p | apers | ne/ sne nas read. | | |
| | | | | | | |
| To acquire advanced knowledge | on environmental se | cience and teo | chnolo | gу | | |
| To be able to report and discuss | the contents of te | xtbooks and p | apers | he/she has read. | | |
| | | | | | | |
| Evaluation of achievement | | | | | | |
| The evaluation is based on the s | cores of reports. pr | esentations. a | and ex | amination. | | |
| The evaluation is based on the s | cores of reports, pr | esentations, a | and ex | amination. | | |
| Examination | | , | | | | |
| 試験期間中には何も行わない | | | | | | |
| None during exam period | | | | | | |
| Details of examination | | | | | | |
| | | | | | | |
| | | | | | | |
| Uther information | | | | | | |
| Supervisor | | | | | | |
| Supervisor | | | | | | |
| Reference URL | | | | | | |
| | | | | | | |
| Office hours | | | | | | |
| Students are encouraged visiting | by appointment. | | | | | |
| Students are encouraged visiting | by appointment | | | | | |
| Relations to attainment objectives of learning and education | | | | | | |

Key words

Environmental science, environmental technology, eco-technology, environmental engineering Environmental science, environmental technology, eco-technology, environmental engineering

(M44630250)Advanced Environmental and Ecological Systems I[Advanced Environmental and Ecological Systems I]

| Subject name[English] | Advanced Enviro | onmental | and F | Ecolog | ical Systems I[Adva | anced Environmen | tal and Ecological |
|---|--|--|--|--|--|--|--|
| | Systems I | | | 6 | | | |
| Schedule number | M44630250 | M44630250 Subject area Advanced Environmental and Life | | Required or elective | Elective | | |
| Time of starting a course | Fall term | Day week.r | of | the I | Intensive | Credit(s) | 2 |
| Faculty | Graduate Progra | m for Ma | ster's | - Degro | ee | Subject grade | 1~ |
| Department Offered | Environmental a | nd Life So | cience | es | | Beggining | M1, M2 |
| Charge teacher name[Roman | S4系教務委員 | 4keikvom | nu Iin- | -S | | grade | |
| alphabet mark] | | | | _ | | | |
| Numbering | | | | | | | |
| This course will provide the st environmental and ecological sys This course will provide the st environmental and ecological sys Contents of class The classes will be given by his/ contents of this course depend of The classes will be given by his/ contents of this course depend of Self Preparation and Review Related subjects | udents with the tems. udents with the tems. /her supervisor. Th n his/her supervis /her supervisor. Th n his/her supervis | opportuni opportuni ne studer or. ne studer or. | ity to ity to nts wi | > stud | y on the selected y on the selected equired to read text equired to read text | subject in the re subject in the re books and papers books and papers | ealm of advanced ealm of advanced but the type and but the type and |
| Supervisor will recommend textbo Supervisor will recommend textbo Notes for reference | ooks and papers to ooks and papers to | o student o student | s. s. | | | | |
| Goals to be achieved To acquire advanced knowledge of To be able to report and discuss To acquire advanced knowledge of To be able to report and discuss Evaluation of achievement The evaluation is based on the so The evaluation is based on the so Examination 試験期間中には何も行わない None during exam period Details of examination Other information Supervisor | on environmental s the contents of te on environmental s the contents of te cores of reports, p cores of reports, p | science al extbook a science al extbook a resentati resentati | nd teo nd pa nd teo nd pa ons, a | chnolo pers h chnolo pers h and ex and ex | gy and ecological sys le/she has read. gy and ecological sys le/she has read. amination. amination. | stems | |
| Supervisor Reference URL | | | | | | | |
| Office hours Students are encouraged visiting | by appointment. | | | | | | |
| Students are encouraged visiting Relations to attainment objective | by appointment. as of learning and a | educatior | 1 | | | | |

Key words

Ecological systems, industrial ecology, environmental technology, materials flows Ecological systems, industrial ecology, environmental technology, materials flows

| (M44630270)Special | Topics in Inorgani | c Chemistry[Special | Topics in Inorga | nic Chemistry] |
|----------------------|---------------------|----------------------|---------------------|----------------|
| (IVITTOJUZ/U)ODUCIAI | I ODICS IN INOrgani | C Chemistry Lopeciai | I ODICS III IIIOIga | |

| Subject | Special Topics in Inorganic Chemis | try[Special Topic | s in Inorganic Chemis | stry] | | | | |
|-----------------------------------|---|--------------------|--------------------------|--------------------|----------------|--|--|--|
| name[Englisn] Schedule number | M44630270 Subject area Advanced Required or Electronic Advanced | | | | | | | |
| | | | and Life Sciences | 0.00010 | | | | |
| Time of starting a | Fall2 term | Day of the | Fri.2~2 | Credit(s) | 1 | | | |
| Course | Cueduste Dremen far Master's Da | week,period | | Cubic et | 1 | | | |
| Faculty | Graduate Program for Master's De | gree | | grade | 1~ | | | |
| Department Offered | Environmental and Life Sciences | | | Beggining grade | M1, M2 | | | |
| Charge teacher | 角田 範義 KAKUTA Noriyoshi | | | | | | | |
| name[Roman | | | | | | | | |
| alphabet mark] | | | | | | | | |
| Numbering | | | | | | | | |
| Objectives of class | | | | | | | | |
| The present class is in | ntended to provide this extended re | eadership with a | concise overview of | the application | s of inorganic | | | |
| chemistry in a world that | at is increasingly dominated by techn | nology and its ram | ifications, beneficial o | or otherwise. | | | | |
| The present class is in | ntended to provide this extended re | eadership with a | concise overview of | the application | s of inorganic | | | |
| chemistry in a world that | at is increasingly dominated by techr | nology and its ram | ifications, beneficial o | or otherwise. | | | | |
| Contents of class | | | | | | | | |
| based on the textbook | of "Inorganic Chemistry: An industria | al and Environmer | tal Perspective" by] | Γ.W.Swaddle. | | | | |
| | | | | | | | | |
| 1.Chemical Energetics | | | | | | | | |
| .Kinetics and Thermody | namics | | | | | | | |
| .Activities of Electrolyte | e Solutions | | | | | | | |
| .Equilibrium and Energy | | | | | | | | |
| .Temperature and Press | sure Effects on Equilibrium | | | | | | | |
| .Chemical Kinetics | | | | | | | | |
| Ionization Potential and | d Electron Affinity | | | | | | | |
| Electronegativity and E | Bond Energies | | | | | | | |
| .Electronegativity and C | Chemical Properties | | | | | | | |
| .Hard and Soft Acids ar | nd Bases | | | | | | | |
| .Multiple Bonding and It | s Chemical Consequences | | | | | | | |
| Explosives and Propella | ants | | | | | | | |
| | | | | | | | | |
| 2.Inorganic Solids as a l | Heterogeneous Catalysts | | | | | | | |
| 5 terms | | | | | | | | |
| 3.Silicates, Aluminates, | and Phosphates | | | | | | | |
| / termes | l Atur D-llution | | | | | | | |
| 4. The Atomosphere and 5 terms | Aunospheric Pollution | | | | | | | |
| 5 Nitrogen Phosphorus | and Potash in Agriculture | | | | | | | |
| 7 terms | | | | | | | | |
| 6 Sulfur and Sulfur Com | npounds | | | | | | | |
| 4 terms | | | | | | | | |
| | | | | | | | | |
| based on the textbook | of "Inorganic Chemistry: An industria | al and Environmer | ntal Perspective″ by] | T.W.Swaddle. | | | | |
| 1 Chemical Energetics | | | | | | | | |
| Kinetics and Thermody | mamics | | | | | | | |
| Activities of Flectrolute | e Solutions | | | | | | | |
| Fauilibrium and Energy | | | | | | | | |
| Temperature and Press | sure Effects on Equilibrium | | | | | | | |
| Chemical Kinetics | | | | | | | | |
| Jonization Potential and | d Flectron Affinity | | | | | | | |
| Electronegativity and F | Bond Energies | | | | | | | |
| Electronegativity and C | Chemical Properties | | | | | | | |
| LIGGE CHOSALIVILY AND C | | | | | | | | |

| .Hard and Soft Acids a .Multiple Bonding and I .Explosives and Propel | nd Bases ts Chemical Co lants | onsequences | | | | |
|---|-------------------------------------|---------------------------|--------------------|-------------------------|---------|----------|
| 2 Inorganic Solids as a | Heterogeneou | s Catalysts | | | | |
| 5 terms | | o outur, oto | | | | |
| 3.Silicates, Aluminates | , and Phosphat | es | | | | |
| 7 termes | • | | | | | |
| 4.The Atomosphere an | d Atmospheric | Pollution | | | | |
| 5 terms | | | | | | |
| 5.Nitrogen, Phosphorus | s, and Potash in | n Agriculture | | | | |
| 7 terms | | | | | | |
| 6.Sulfur and Sulfur Cor | npounds | | | | | |
| 4 terms | | | | | | |
| | | | | | | |
| Self Preparation and F | (eview | | | | | |
| Deleted and to de | | | | | | |
| Related subjects | | | | | | |
| Basic knowledges of pl | nysical chemist | try and inorganic chem | istry are required | | | |
| Terthock1 | Rock title | Inorganic Chemetry | istry are required | • | ISBN | 0-12- |
| TOXODONT | DOOK GOO | Inorganic Onemstry | | | IODIA | 678550-3 |
| | Author | T.W.Swaddle | Publisher | Academic Press | Publish | 1997 |
| | | | | | year | |
| Notes for textbook | | | | | | |
| | | | | | | |
| Notes for reference | | | | | | |
| Goals to be achieved | | | | | | |
| To understand basics | of "application | of inorganic chemistry | " | | | |
| To understand basics | of "application | of inorganic chemistry | | | | |
| Evaluation of achieven | nent | | | | | |
| 30% Homework report, | 70% pre-exami | ination or report | | | | |
| 30% Homework report, | 70% pre-exami | ination or report | | | | |
| Examination | | | | | | |
| 試験期間中には何も行 | テわない | | | | | |
| None during exam peri | od | | | | | |
| Details of examination | | | | | | |
| | | | | | | |
| Other information | | | | | | |
| Room # B−302, E−mail | : kakuta@ens.tu | ut.ac.jp, | | | | |
| Room # B−302, E−mail | : kakuta@ens.tu | ut.ac.jp, | | | | |
| Reference URL | | | | | | |
| Office hours | | | | | | |
| Anytime when I will be | | | | | | |
| Anytime when I will be | | | | | | |
| Relations to attainmen | nt objectives of | f learning and educatio | n | | | |
| | | | | | | |
| | | | | | | |
| | | | | | | |
| | | | | | | |
| Key words | | | | | | |
| Chemical enegetics, He | eterogeneous c | catalysts, silicate, Alum | ninate, Phosphate | s, pollution, Nitrogen, | Sulfur | |
| Chemical enegetics, He | eterogeneous c | atalysts, silicate, Alum | ninate, Phosphate | s, pollution, Nitrogen, | Sulfur | |

(M44630300)Applied Environmental Biology[Applied Environmental Biology]

| Subject | Applied Envi | ronmental Biology[A | Applied Environme | ntal Biology] | | | | | | |
|----------------------------------|--|------------------------|---------------------------|-------------------|--------------------|-----------------|--|--|--|--|
| name[English] Schedule number | M44630300 Subject area Advanced Required or Elective | | | | | | | | | |
| | 10144030300 | Environmental elective | | | | | | | | |
| | | | | and Life Sciences | | | | | | |
| Time of starting a course | Fall1 term | | Day of the week.period | Fri.2~2 | Credit(s) | 1 | | | | |
| Faculty | Graduate Pr | ogram for Master's | Degree | | Subject grade | 1~ | | | | |
| Department Offered | Environment | al and Life Sciences | S | | Beggining grade | M1, M2 | | | | |
| Charge teacher | 中鉢 淳 NA | KABACHI Atsushi | | | 8.200 | | | | | |
| name[Roman | | | | | | | | | | |
| alphabet mark] | | | | | | | | | | |
| Numbering | | | | | | | | | | |
| Objectives of class | | | | | | | | | | |
| The aim of this cou | rse is to lea | arn concepts of v | vhat life is, and | how we can use | the knowledg | e of biology in | | | | |
| environmental/agricult | iral sciences. | | | | | | | | | |
| | | | | | | | | | | |
| The aim of this cou | rse is to lea | arn concepts of v | vhat life is, and | how we can use | the knowledg | e of biology in | | | | |
| environmentai/ agricuiti | iral sciences. | | | | | | | | | |
| Contonto of alago | | | | | | | | | | |
| 1st week Biodiversity a | and evolution | | | | | | | | | |
| 2nd week Prokaryotic | renomes | | | | | | | | | |
| 3rd week:Eukaryotic ge | enomes | | | | | | | | | |
| 4th week:Plant-microb | e interactions | | | | | | | | | |
| 5th week:Agricultural p | ests and disea | ases | | | | | | | | |
| 6th week:Integrated pe | st managemer | nt | | | | | | | | |
| 7th week:Genetically m | nodified crops | | | | | | | | | |
| 8th week:Summary | | | | | | | | | | |
| | | | | | | | | | | |
| | | | | | | | | | | |
| 1st week:Biodiversity a | and evolution | | | | | | | | | |
| 2nd week:Prokaryotic | genomes | | | | | | | | | |
| 3rd week:Eukaryotic ge | enomes | | | | | | | | | |
| 4th week:Plant-microb | e interactions | | | | | | | | | |
| 5th week: Agricultural p | ests and disea | ases | | | | | | | | |
| 6th week:Integrated pe | st managemer | nt | | | | | | | | |
| /th week: Genetically m | nodified crops | | | | | | | | | |
| 8th week: Summary | | | | | | | | | | |
| | | | | | | | | | | |
| Calf December 17 | | | | | | | | | | |
| No proportion is the second | eview | lace review of hered | loute is highly as - | ommandad | | | | | | |
| No preparation is requir | ed but after (| class review of hand | louts is highly rec | ommended | | | | | | |
| Related subjects | sa, suc artor (| | | | | | | | | |
| | | | | | | | | | | |
| Notes for textbook | | | | | | | | | | |
| No textbooks are requir | red. | | | | | | | | | |
| No textbooks are requi | red. | | | | | | | | | |
| Reference1 | Book title | Molecular Biology | of the Cell | | ISBN | 978- | | | | |
| | | | | | | 0815344643 | | | | |
| | Author | Bruce Alberts | Publisher | Garland Science | Publish | 2014 | | | | |
| | | et al. | | | year | | | | | |
| Reference2 | Book title | Evolution | | | ISBN | 978- | | | | |
| | | | | | | 0879696849 | | | | |

| | Author | Nicholas H. | Publisher | Cold Spring | Publish | 2007 |
|---------------------------|-------------------|--------------------------|-----------------|------------------|---------|------------|
| | | Barton et al. | | Harbor | year | |
| | | | | Laboratory Press | | |
| Reference3 | Book title | Plant Physiology | | | ISBN | 978- |
| | Authory | Lincoln Toir | Dublishan | Simour | Dublich | 0878935659 |
| | Author | Eduardo Zeiger | Publisher | Associates Inc | Publish | 2010 |
| Notes for reference | | | | //3500/0203 110. | yoan | |
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| Goals to be achieved | | | | | | |
| (1) Understand the cor | ncept of evolut | ion and biodiversity. | | | | |
| (2) Can explain how ge | nomes are ana | lyzed. | | | | |
| (3) Can tell the differen | nce between pi | · rokaryotic and euka | ryotic genomes | | | |
| (4) Know various biolog | gical interaction | ns. | | | | |
| (5) Know important agr | ricultural pests | and diseases. | | | | |
| (6) Understand the cor | ncept of integra | ated pest manageme | ent. | | | |
| (7) Understand the tec | hnology for de | veloping genetically | modified crops. | | | |
| | | | | | | |
| (1) Understand the cor | ncept of evolut | ion and biodiversity. | | | | |
| (2) Can explain how ge | nomes are ana | lyzed. | | | | |
| (3) Can tell the differen | nce between pi | rokaryotic and eukai | ryotic genomes | | | |
| (4) Know various biolog | gical interaction | ns. | | | | |
| (6) Understand the cor | ocent of integra | and diseases. | ant | | | |
| (7) Understand the tec | hnology for de | veloning genetically | modified crops | | | |
| | interest for de | veroping genetically | | | | |
| Evaluation of achieven | nent | | | | | |
| Achievements are eval | uated by essay | /s/term papers. | | | | |
| Grade: Score range | | | | | | |
| A: 80-100 | | | | | | |
| B: 65-79 | | | | | | |
| C: 55–64 | | | | | | |
| D: 0-54 | | | | | | |
| Achievements are eval | uated by essay | /s/term papers. | | | | |
| Grade: Score range | | | | | | |
| A: 60-100 B: 65-79 | | | | | | |
| C: 55-64 | | | | | | |
| D: 0-54 | | | | | | |
| Examination | | | | | | |
| レポートで実施 | | | | | | |
| By Report | | | | | | |
| Details of examination | | | | | | |
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| Other information | | | | | | |
| Deference LIDI | | | | | | |
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| Office hours | | | | | | |
| Emails are welcome. | | | | | | |
| Emails are welcome. | | | | | | |
| Relations to attainmen | t objectives of | learning and educa | tion | | | |
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| Key worde | | | | | | |
| evolution biodiversity | genomes high | gical interactions | griculture | | | |
| evolution, biodiversity, | genomes. biolo | gical interactions. a | griculture | | | |

(M45610010)Seminar on Architecture and Civil Engineering I[Seminar on Architecture and Civil Engineering I]

| Subject name[English] | Seminar on A | rohitaatura and Civ | il Engineering IS | minar on Archit | oture and Civil | | |
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| | Engineering 1 | | | | | | |
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| Schedule number | M45610010 | Subject area | Advanced | Required or | Required | | |
| | | | Architecture | elective | | | |
| | | | and Civil | | | | |
| | | | Engineering | | | | |
| Time of starting a course | Year | Day of the | Intensive | Credit(s) | 3 | | |
| | | week,period | | | | | |
| Faculty | Graduate Progra | am for Master's Degre | ee | Subject grade | 1~ | | |
| Department Offered | Architecture an | d Civil Engineering | | Beggining | M1, M2 | | |
| - | | | | grade | | | |
| Charge teacher name[Roman | S5系教務委員, | 5系各教員 5kei kyo | mu Iin-S, 5kei kakuk | youin | I | | |
| alphabet mark] | | | | | | | |
| Numbering | | | | | | | |
| | | | | | | | |
| Objectives of class | | | | | | | |
| All the students are required to | attend all the ser | minars, which is arrar | nged by the laborate | ory supervisor for | the special study | | |
| subjects related to the current re | esearch activity of | f the laboratory. The | scheduled program | of the seminars is a | announced by the | | |
| supervisor at the guidance of the | seminar. | | | | | | |
| Contents of class | | | | | | | |
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| | | | | | | | |
| Self Preparation and Review | | | | | | | |
| | | | | | | | |
| Related subjects | | | | | | | |
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| | | | | | | | |
| Notes for textbook | | | | | | | |
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| Notes for reference | | | | | | | |
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| Coole to be achieved | | | | | | | |
| Goals to be achieved | | | | | | | |
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| Evaluation of achievement | | | | | | | |
| Report | | | | | | | |
| Examination | | | | | | | |
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| Details of exemination | | | | | | | |
| Details of examination | | | | | | | |
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| Other information | | | | | | | |
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| Office hours | | | | | | | |
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| Relations to attainment objective | s of learning and | education | | | | | |
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| Key words | | | | | | | |
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| M45610020)Seminar on | Architecture and | Civil Engineering II | Seminar on Architect | ture and Civil Engineering II |
|----------------------|------------------|----------------------|----------------------|-------------------------------|
| | | | | |

| Subject name[English] | Seminar on A Engineering II] | Architecture and Civ | il Engineering II[So | eminar on Archit | ecture an |
|---|---------------------------------|---------------------------|--|-------------------------|------------|
| Schedule number | M45610020 | Subject area | Advanced Architecture and Civil Engineering | Required or elective | Required |
| Time of starting a course | Year | Day of the week.period | Intensive | Credit(s) | 3 |
| Faculty | Graduate Progr | ram for Master's Degr | ee | Subject grade | 2~ |
| Department Offered | Architecture ar | nd Civil Engineering | | Beggining grade | M2 |
| Charge teacher name[Roman alphabet mark] | S5系教務委員 | , 5系各教員 5kei kyo | mu Iin−S, 5kei kakuk | youin | |
| Numbering | | | | | |
| Objectives of class | | | | | |
| All the students are required to | attend all the se | eminars, which is arra | nged by the laborat | orv supervisor for | the specia |
| subjects related to the current re | esearch activity o | of the laboratory. The | scheduled program | of the seminars is | announced |
| supervisor at the guidance of the | seminar. | | concarica program | | |
| Contents of class | | | | | |
| | | | | | |
| Self Preparation and Review | | | | | |
| Related subjects | | | | | |
| Notes for textbook | | | | | |
| Notes for reference | | | | | |
| Goals to be achieved | | | | | |
| Evaluation of achievement | | | | | |
| Report | | | | | |
| Examination | | | | | |
| その他 | | | | | |
| By Report | | | | | |
| Details of examination | | | | | |
| Other information | | | | | |
| Reference URL | | | | | |
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| Relations to attainment objective | es of learning and | d education | | | |
| Relations to attainment objective | es of learning and | d education | | | |
| Ornice nours | es of learning and | d education | | | |

(M45610030)Thesis Research on Architecture and Civil Engineering[Thesis Research on Architecture and Civil Engineering]

| Subject name[English] | Thesis Research | on Architecture and | Civil Engineering[T | hesis Research on | Architecture and | | |
|------------------------------------|--|-----------------------|----------------------|---------------------|-------------------|--|--|
| | Civil Engineering | | | | | | |
| Sebadula number | M15610030 Subject area Advanced Dequired as Dequired | | | | | | |
| Schedule number | 10145610030 | Subject area | Advanced | Required or | Required | | |
| | | | Architecture | elective | | | |
| | | | and Civil | | | | |
| | | | Engineering | | | | |
| Time of starting a course | 2Years | Day of the | Intensive | Credit(s) | 6 | | |
| | | week,period | | | | | |
| Faculty | Graduate Progra | m for Master's Degre | ee | Subject grade | 1~2 | | |
| Department Offered | Architecture and | I Civil Engineering | | Beggining | M1, M2 | | |
| | | | | grade | | | |
| Charge teacher name[Roman | S5系教務委員, | 5系各教員 5kei kyo | mu Iin−S, 5kei kakuk | youin | | | |
| alphabet mark] | | | | | | | |
| Numbering | | | | | | | |
| Objectives of class | | | | | | | |
| | ., | | | | | | |
| Research on architecture and civ | /il engineering | | | | | | |
| | | | | | | | |
| Contents of class | | | | | | | |
| It depends on the laboratory. All | students must pr | esent their thesis at | the end of the cou | rse and take a fina | al examination on | | |
| the thesis, as a requirement for t | the graduation of t | he master course. T | he study for the the | sis is planned and | conducted under | | |
| the guidance of the supervisor | 0 | | • | | | | |
| 0 | | | | | | | |
| | | | | | | | |
| Self Preparation and Review | | | | | | | |
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| Related subjects | | | | | | | |
| It depends on the laboratory | | | | | | | |
| Notes for textbook | | | | | | | |
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| Notes for reference | | | | | | | |
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| Goals to be achieved | | | | | | | |
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| Evaluation of aphievement | | | | | | | |
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| Evaluation is based on report. | | | | | | | |
| Examination | | | | | | | |
| その他 | | | | | | | |
| By Report | | | | | | | |
| Details of examination | | | | | | | |
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| Other information | | | | | | | |
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| Office hours | | | | | | | |
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| Relations to attainment objective | as of learning and | education | | | | | |
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| Key words | | | | | | | |
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(M45610030)Thesis Research on Architecture and Civil Engineering[Thesis Research on Architecture and Civil Engineering]

| Subject name[English] | Thesis Research | h on Architecture and | Civil Engineering | hesis Research on | Architecture and | | | |
|---|--------------------|---------------------------|--|-------------------------|---------------------|--|--|--|
| Subject Hame[Engish] | Civil Engineering] | | | | | | | |
| Schedule number | M45610030 | Subject area | Advanced Architecture and Civil Engineering | Required or elective | Required | | | |
| Time of starting a course | 2Years | Day of the week.period | Intensive | Credit(s) | 6 | | | |
| Faculty | Graduate Progra | am for Master's Degre | e | Subject grade | 1~ | | | |
| Department Offered | Architecture an | d Civil Engineering | | Beggining grade | M1, M2 | | | |
| Charge teacher name[Roman alphabet mark] | S5系教務委員 | ,5系各教員 5kei kyoi | mu Iin−S, 5kei kakuk | xyouin | 1 | | | |
| Numbering | | | | | | | | |
| Objectives of class | | | | | | | | |
| This thesis research on architect | ure and civil engi | neering is designated | to deepen the know | wledge and enhanc | e the skills of the | | | |
| students in their research fields t | hrough the self-c | priented endeavour wi | th the instruction of | f his/her superviso | r(s). | | | |
| Contents of class | <u> </u> | | | | | | | |
| The subjects and the contents of | of the thesis varv | depending on the la | boratory. All studer | its must present t | heir thesis at the | | | |
| end of the course and take a fir | al examination or | n the thesis, as a req | uirement for the gr | aduation of the ma | aster course. The | | | |
| study for the thesis is planned ar | d conducted und | er the guidance of the | e supervisor(s). | | | | | |
| Self Preparation and Review | | | | | | | | |
| | | | | | | | | |
| Related subjects | | | | | | | | |
| TBD by the laboratory | | | | | | | | |
| Notes for textbook | | | | | | | | |
| TBD by the laboratory | | | | | | | | |
| Notes for reference | | | | | | | | |
| Goals to be achieved | | | | | | | | |
| Evaluation of achievement | | | | | | | | |
| This credit is assigned for all the | process for the p | preparation and preser | ntation of the thesis | 5. | | | | |
| Examination | | | | | | | | |
| その他 | | | | | | | | |
| By Report | | | | | | | | |
| Details of examination | | | | | | | | |
| Other information | | | | | | | | |
| Refer to administration office. | | | | | | | | |
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| Refer to the URL of each laborat | ory | | | | | | | |
| Pafer to administration office | | | | | | | | |
| Relations to attainment objective | s of learning and | education | | | | | | |
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| Key words | | | | | | | | |

(M4561003T)Thesis Research on Architecture and Civil Engineering[Thesis Research on Architecture and Civil Engineering]

| Subject name[English] | Thesis Research on Architecture and Civil Engineering[Thesis Research on Architecture and | | | | | | |
|--|---|------------------------|-----------------------|-------------------|---------------------|--|--|
| | Civil Engineering] | | | | | | |
| Schedule number | M4561003T | Subject area | Advanced | Required or | Required | | |
| | | | Architecture | elective | | | |
| | | | and Civil | | | | |
| The station of the station of the state of t | X | Due of the | Engineering | 0 | 0 | | |
| lime of starting a course | Year | Day of the week.period | Intensive | Gredit(s) | 6 | | |
| Faculty | Graduate Progra | m for Master's Degr | ee | Subject grade | 2~ | | |
| Department Offered | Architecture and | l Civil Engineering | | Beggining | M2 | | |
| | | | | grade | | | |
| Charge teacher name[Roman | S5系教務委員 5 | ōkei kyomu Iin−S | | | | | |
| alphabet mark] | | | | | | | |
| Numbering | | | | | | | |
| Objectives of class | | | | | | | |
| This thesis research on architect | ture and civil engin | eering is designated | to deepen the know | vledge and enhanc | e the skills of the | | |
| students in their research fields t | through the self-or | riented endeavour wi | th the instruction of | his/her superviso | r(s). | | |
| Contents of class | | | | | | | |
| The subjects and the contents o | of the thesis vary | depending on the la | boratory. All studen | ts must present t | heir thesis at the | | |
| end of the course and take a fir | al examination on | the thesis, as a rec | uirement for the gr | aduation of the m | aster course. The | | |
| study for the thesis is planned ar | nd conducted unde | r the guidance of the | e supervisor(s). | | | | |
| Self Preparation and Review | | | | | | | |
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| Related subjects | | | | | | | |
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| Notes for textbook | | | | | | | |
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| Notes for reference | | | | | | | |
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| Goals to be achieved | | | | | | | |
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| Evaluation of achievement | | | | | | | |
| This credit is assigned for all the | process for the pr | reparation and prese | ntation of the thesis | | | | |
| Examination | | | | | | | |
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| By Report | | | | | | | |
| Details of examination | | | | | | | |
| Oth on information | | | | | | | |
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| Refer to the URL of each laborat | orv | | | | | | |
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| Refer to administration office | | | | | | | |
| Relations to attainment objective | s of learning and e | education | | | | | |
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| Key words | | | | | | | |
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(M45610040)Seminar on Architecture and Civil Engineering[Seminar on Architecture and Civil Engineering]

| Subject name[English] | Seminar on Architecture and Civil Engineering Seminar on Architecture and Civil | | | | | | | |
|--|---|-----------------------|-----------------------|----------------------|-------------------|--|--|--|
| | Engineering] | | | | | | | |
| Schedule number | M45610040 | Subject area | Advanced | Required or | Required | | | |
| | | | Architecture | elective | | | | |
| | | | and Civil | | | | | |
| | | | Engineering | | | | | |
| Time of starting a course | Year | Day of the | Intensive | Credit(s) | 6 | | | |
| | | week,period | | | | | | |
| Faculty | Graduate Progra | am for Master's Degr | ee | Subject grade | 2~ | | | |
| Department Offered | Architecture an | d Civil Engineering | | Beggining | M2 | | | |
| | 01万批改千号 | | T O EI : I I I | grade | | | | |
| Charge teacher name Roman | 55 杀 软 務 安 貝, | 5糸合纹貝 5Kei Kyo | mu lin-5, 5kei kakuk | youin | | | | |
| alphabet mark | | | | | | | | |
| Numbering | | | | | | | | |
| Objectives of class | | | | | | | | |
| All the students are required to | attend all the ser | minars, which is arra | nged by the laborate | ory supervisor for | the special study | | | |
| subjects related to the current re | esearch activity of | the laboratory. The | scheduled program | of the seminars is a | announced by the | | | |
| supervisor at the guidance of the | seminar. | | | | | | | |
| Contents of class | | | | | | | | |
| In each seminar, students purs | sue several resea | arch topics and/or | undertake projects | collectively and | solely under the | | | |
| instruction of the faculty member | rs of the departme | ent and/or those of o | other departments. | | | | | |
| Self Preparation and Review | | | | | | | | |
| | | | | | | | | |
| Related subjects | | | | | | | | |
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| Notes for textbook | | | | | | | | |
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| Notes for reference | | | | | | | | |
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| Goals to be achieved | | | | | | | | |
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| Evolution of achievement | | | | | | | | |
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| Examination | | | | | | | | |
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| Other Information | | | | | | | | |
| | | | | | | | | |
| Reference URL | | | | | | | | |
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| Office hours | | | | | | | | |
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| Relations to attainment objectives of learning and education | | | | | | | | |
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| Key words | | | | | | | | |
| | | | | | | | | |

(M45630010)Elasticity and Stability[Elasticity and Stability]

| Subject name[English] | Electicity and Sta | bility Flacticity and | Stability] | | | | |
|------------------------------------|---|-----------------------|---------------------|---------------------|---------------------|--|--|
| | M45630010 | | | Poguirod or | Flective | | |
| Schedule number | M43030010 | Subject area | Auvanceu | Required or | Elective | | |
| | | | and Civil | 01000140 | | | |
| | | | Engineering | | | | |
| Time of starting a course | Fall term | Dav of the | Tue.3~3 | Credit(s) | 2 | | |
| | | week.period | | | _ | | |
| Faculty | Graduate Program | n for Master's Degre | e | Subject grade | 1~ | | |
| Department Offered | Architecture and | Civil Engineering | | Beggining | M1, M2 | | |
| | | | | grade | | | |
| Charge teacher name[Roman | 松本 幸大 MATS | SUMOTO Yukihiro | | | | | |
| alphabet mark] | | | | | | | |
| Numbering | | | | | | | |
| Objectives of class | | | | | | | |
| This lecture is concerned with t | the static continuu | im mechanics of ela | astic 2-dimensional | bodies. The prima | ry purpose is to | | |
| encourage students to gain the | e fundamental cor | ncept and to raise | their potential ab | ilities for advance | ed and practical | | |
| applications in the future. | | | | | | | |
| This lecture is concerned with t | the static continuu | im mechanics of ela | astic 2-dimensional | bodies. The prima | ry purpose is to | | |
| encourage students to gain th | e fundamental cor | ncept and to raise | their potential ab | ilities for advance | ed and practical | | |
| applications in the future. | | | | | | | |
| Contents of class | | | | | | | |
| 1st – 6th week; Mechanics of ela | sticity | | | | | | |
| Tensor Analysis in Cartesian Coo | rdinates | | | | | | |
| Stresses and Equilibrium | | | | | | | |
| Strain-Displacement Relations | | | | | | | |
| Constitutive Equations in Isotropi | c Elastic Materials | | | | | | |
| 7th - 11th week; Mechanics of el | asticity for compos | ite material | | | | | |
| Orthotropic material | | | | | | | |
| Mixturing rule | | | | | | | |
| Laminate theory | ww.af.baua.awd.ulat | | | | | | |
| 12th - 15th week, Elastic buckli | ng of bars and plate | es | | | | | |
| | | | | | | | |
| Ist – 6th week; Mechanics of elas | sticity | | | | | | |
| Tensor Analysis in Cartesian Coo | rdinates | | | | | | |
| Stresses and Equilibrium | | | | | | | |
| Constitutive Equations in Instran | a Electic Materiale | | | | | | |
| 7th - 11th week: Mechanics of el | acticity for compos | ite material | | | | | |
| Orthotropic material | ascicity for compos | | | | | | |
| Mixturing rule | | | | | | | |
| Laminate theory | | | | | | | |
| 12th – 15th week; Elastic buckli | ng of bars and plate | es | | | | | |
| | | | | | | | |
| Self Preparation and Review | | | | | | | |
| - | | | | | | | |
| Related subjects | | | | | | | |
| | | | | | | | |
| Notes for textbook | | | | | | | |
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| Notes for reference | | | | | | | |
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| Goale to be achieved | | | | | | | |
| The primary purpose is to one | urare studente to | , gain the fundame | ntal concept and + | o raise their note | ntial abilities for | | |
| advanced and practical application | ne in the future | gain the fundame | ntar concept and t | o raise trielr pote | ntial aplitues for | | |
| The primary purpose is to enco | no in the luture. Durage students to | gain the fundame | ntal concept and t | o raise their note | ntial abilities for | | |
| advanced and practical applicatio | tions in the future. | | | | | | |

Evaluation of achievement

| Based on reports |
|--|
| Based on reports |
| Examination |
| レポートで実施 |
| By Report |
| Details of examination |
| |
| Other information |
| |
| Reference URL |
| http://www.st.ace.tut.ac.jp/ |
| http://sel.ace.tut.ac.jp/y-matsum/ |
| http://www.st.ace.tut.ac.jp/ |
| http://sel.ace.tut.ac.jp/y-matsum/ |
| Office hours |
| Please contact by email. |
| Please contact by email. |
| Relations to attainment objectives of learning and education |
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| |
| Key words |
| |

(M45630090)Coastal Hydraulics[Coastal Hydraulics]

| Subject | Coastal Hydr | aulics[Coastal Hydrau | ulics] | | | |
|---|--|--|--|---|------------------------------------|----------------------------------|
| Schedule number | M45630090 | | Subject area | Advanced Architecture and Civil Engineering | Required or elective | Elective |
| Time of starting a | Fall term | | Day of the | Tue.4~4 | Credit(s) | 2 |
| Faculty | Graduate Pro | gram for Master's De | egree | | Subject grade | 1~ |
| Department Offered | Architecture | and Civil Engineering | | | Beggining grade | M1, M2 |
| Charge teacher name[Roman alphabet mark] | 加藤 茂 KAT | O Shigeru | | | | 1 |
| Numbering | | | | | | |
| To understand the basic including numerical calc To understand the basic including numerical calc Contents of class Introduction of Coasta | c concept of co ulation. c concept of co ulation. I Engineering | astal engineering and | l the advanced kr | nowledge of coastal p | orocess, design orocess, design | and protection and protection |
| Shore Processes near-shore current, co Coastal Design design process, model Computation of Coasta sediment transport rate | oastal material, classification, j al Morphology ce, analytical co | beach property, sedir ohysical & numerical I mputation, numerical | ment transport, e models, etc. solutions, etc. | tc. | | |
| Introduction of Coasta water waves, wave the Shore Processes near-shore current, co Coastal Design design process, model Computation of Coasta accliment transport red | l Engineering pories, tides and pastal material, classification, j al Morphology | d water levels, wave b beach property, sedir ohysical & numerical i | preaking, etc. ment transport, e models, etc. | tc. | | |
| Self Preparation and Re Self preparation before references. Self preparation before references. Related subjects Basic knowledge of coas Basic knowledge of coast | the class an the class an the class an the class an stal engineering | d review after the d review after the is desirable. is desirable. | class are necess | sary using the distr sary using the distr | ibuted handout ibuted handout | and/or some and/or some |
| Notes for textbook No textbook is required No textbook is required | for this class. I for this class. I | _ecture handout will h _ecture handout will h | be distributed. | | | |
| Reference1 | Book title | Water Wave Mecha | nics for Enginee | rs and Scientists - | ISBN | |
| | Author | Robert G. Dean & Robert A Dalrymple | Publisher | World Scientific | Publish year | |
| Reference2 | Book title | Introduction to Coa | astal Engineering | and Management - | ISBN | |

| | | Advanced Series of | on OceanEngine | ering - Vol. 16 | |
|-------------------------|-------------------|------------------------|----------------|------------------|--------------|
| | Author | J. William | Publisher | World Scientific | Publish year |
| | | Kamphuis | | | |
| Reference3 | Book title | Basic Coastal Eng | ineering | | ISBN |
| | Author | Robert M. | Publisher | Kluwer Academic | Publish year |
| | | Sorensen | | Publishers | |
| Notes for reference | | | • | | · · · |
| | | | | | |
| Goals to be achieved | | | | | |
| Understanding the cond | cept and metho | dology for coastal er | igineering. | | |
| Understanding the cond | cept and metho | dology for coastal er | igineering. | | |
| Evaluation of achievem | ent | | | | |
| Reports & attendance | | | | | |
| Reports & attendance | | | | | |
| Examination | | | | | |
| レポートで実施 | | | | | |
| By Report | | | | | |
| Details of examination | | | | | |
| | | | | | |
| Other information | | | | | |
| Room : D-812 | | | | | |
| E-mail : s-kato@ace.tu | ıt.ac.jp. | | | | |
| Room : D-812 | | | | | |
| E-mail : s-kato@ace.tu | ıt.ac.jp. | | | | |
| Reference URL | | | | | |
| N/A | | | | | |
| N/A | | | | | |
| Office hours | | | | | |
| At any time. | | | | | |
| But please ask me the | visit time in adv | vance. | | | |
| At any time. | | | | | |
| But please ask me the | visit time in adv | vance. | | | |
| Relations to attainment | t objectives of | learning and education | on | | |
| N/A | | | | | |
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| N/A | | | | | |
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| Kev words | | | | | |
| Sediment transport. Cu | rrent. Waves, S | hore protection and | management | | |
| Sediment transport. Cu | irrent, Waves. S | Shore protection and | management | | |

(M45630190)Advanced Structural System Planning and Design I[Advanced Structural System Planning and Design I]

| | | | an and Desim IAd | | Custom Discusion | | |
|------------------------------------|--|-----------------------|----------------------|---------------------|------------------|--|--|
| Subject name[English] | Advanced Structural System Planning and Design ILAdvanced Structural System Planning | | | | | | |
| <u> </u> | and Design I | | | _ | - | | |
| Schedule number | M45630190 | Subject area | Advanced | Required or | Elective | | |
| | | | Architecture | elective | | | |
| | | | and Civil | | | | |
| | | | Engineering | | | | |
| Time of starting a course | Fall term | Day of the | Intensive | Credit(s) | 2 | | |
| - | | week.period | | | | | |
| Faculty | Graduate Program | n for Master's Degre | 1e | Subject grade | 1~ | | |
| Department Offered | Architecture and | Civil Engineering | | Beggining | M1 M2 | | |
| Dopar unent Onered | | | | modo | WIT, WIZ | | |
| Ohanna tarahan mana [Daman | 05 乙 | The film of the C | | grade | | | |
| Charge teacher name_Roman | 55米软粉安貝 5 | ikel kyomu lin-5 | | | | | |
| alphabet mark | | | | | | | |
| Numbering | | | | | | | |
| Objectives of class | i | | | | | | |
| It depends on the laboratory. T | The resistered stur | dents are required | to attend all the c | eminare which is | arranged by the | | |
| Le contrar anno an ion fan tha ann | | | | enninars, which is | | | |
| laboratory supervisor for the spe | scial study subjects | s related to the cur | rent research activi | ty of the laborator | y. The scheduled | | |
| program of the seminars is annou | inced by the superv | visor at the guidance | e of the seminar. | | | | |
| It depends on the laboratory. T | he resistered stud | dents are required | to attend all the s | eminars, which is | arranged by the | | |
| laboratory supervisor for the spe | ecial study subjects | s related to the cur | rent research activi | ty of the laborator | y. The scheduled | | |
| program of the seminars is annou | unced by the superv | visor at the guidance | e of the seminar. | | | | |
| Contents of class | | | | | | | |
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| Self Preparation and Review | | | | | | | |
| | | | | | | | |
| Related subjects | | | | | | | |
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| Notes for textbook | | | | | | | |
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| Notes for reference | | | | | | | |
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| Goals to be achieved | | | | | | | |
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| Evaluation of achievement | | | | | | | |
| Evaluation of admittoment | | | | | | | |
| | | | | | | | |
| Examination | | | | | | | |
| レポートで実施 | | | | | | | |
| By Report | | | | | | | |
| Details of examination | | | | | | | |
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| Other information | | | | | | | |
| | | | | | | | |
| Reference URL | | | | | | | |
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| Office hours | | | | | | | |
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| Relations to attainment objective | es of learning and e | ducation | | | | | |
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| Key words | | | | | | | |
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(M45630210)Advanced Environmental System Planning and Design I[Advanced Environmental System Planning and Design I]

| Subject name[English] | Advanced Environmental System Planning and Design I[Advanced Environmental System | | | | | | |
|-----------------------------------|---|-----------------------|----------------------|---------------------|------------------|--|--|
| | Planning and Design I] | | | | | | |
| Schedule number | M45630210 | Subject area | Advanced | Required or | Elective | | |
| | | | Architecture | elective | | | |
| | | | and Civil | | | | |
| | | | Engineering | | - | | |
| Time of starting a course | Fall term | Day of the | Intensive | Credit(s) | 2 | | |
| Easylta. | Graduata Bragran | week,period | | Subject mede | 1~ | | |
| Paculty Department Offered | Architecture and | Civil Engineering | | Subject grade | M1 M2 | | |
| | | Own Engineering | | grade | 1411, 1412 | | |
| Charge teacher name[Roman | S5系教務委員 5 | kei kyomu Iin-S | | 8 | | | |
| alphabet mark] | | | | | | | |
| Numbering | | | | | | | |
| Objectives of class | | | | | | | |
| It depends on the laboratory. T | he resistered stud | lents are required · | to attend all the s | eminars, which is | arranged by the | | |
| laboratory supervisor for the spe | cial study subjects | related to the cur | rent research activi | tv of the laborator | v. The scheduled | | |
| program of the seminars is annou | inced by the superv | isor at the guidance | e of the seminar. | | , | | |
| It depends on the laboratory. T | he resistered stud | lents are required | to attend all the s | eminars, which is | arranged by the | | |
| laboratory supervisor for the spe | cial study subjects | related to the cur | rent research activi | ty of the laborator | y. The scheduled | | |
| program of the seminars is annou | inced by the superv | visor at the guidance | e of the seminar. | | | | |
| Contents of class | | | | | | | |
| | | | | | | | |
| Self Preparation and Review | | | | | | | |
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| Related subjects | | | | | | | |
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| Notes for textback | | | | | | | |
| NOLOS TOP LEXEDOOK | | | | | | | |
| Notes for a former | | | | | | | |
| Notes for reference | | | | | | | |
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| Goals to be achieved | | | | | | | |
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| Evaluation of achievement | | | | | | | |
| | | | | | | | |
| Examination | | | | | | | |
| レポートで実施 | | | | | | | |
| By Report | | | | | | | |
| Details of examination | | | | | | | |
| | | | | | | | |
| Other information | | | | | | | |
| | | | | | | | |
| Reference URL | | | | | | | |
| | | | | | | | |
| Office hours | | | | | | | |
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| Relations to attainment objective | s of learning and e | ducation | | | | | |
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| Key words | | | | | | | |
| | | | | | | | |

(M45630230)Advanced Regional System Planning and Design I[Advanced Regional System Planning and Design I]

| Subject name[English] | Advanced Regional System Planning and Design I[Advanced Regional System Planning and | | | | | |
|------------------------------------|--|-----------------|--------|-----------------------|---|------------------|
| Sahadula numbar | Design I | Subject one | _ | Advanced | Paguirad or | Floativo |
| | WI43030230 | Subject are | a | Architecture | elective | LIECTIVE |
| | | | | and Civil | | |
| | | | | Engineering | | |
| Time of starting a course | Fall term | Day of | the | Intensive | Credit(s) | 2 |
| Franks. | Que durate Durama | week,period | D | | 0.11.1.1.1.1.1.1.1.1.1.1.1.1.1.1.1.1.1. | 1 |
| Faculty Department Offered | Architecture and | n for Master's | Degre | e | Subject grade | ∼ M1_M2 |
| | | | ing | | grade | WIT, WIZ |
| Charge teacher name[Roman | S5系教務委員5 | ikei kyomu Iin- | ·S | | | |
| alphabet mark] | | | | | | |
| Numbering | | | | | | |
| Objectives of class | | | | | | |
| It depends on the laboratory. T | he resistered stud | dents are req | uired | to attend all the s | eminars, which is | arranged by the |
| laboratory supervisor for the spe | cial study subjects | s related to th | e curi | rent research activit | ty of the laborator | y. The scheduled |
| program of the seminars is annou | nced by the superv | visor at the gu | idance | e of the seminar. | | |
| It depends on the laboratory. I | he resistered stud | dents are requ | uired | to attend all the s | eminars, which is | arranged by the |
| program of the seminars is appoint | nced by the super | visor at the gu | idance | of the seminar | Ly OF LITE INDUCATOR | y. The scheduled |
| Contents of class | | visor at the gu | laanoo | | | |
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| Self Preparation and Review | | | | | | |
| Delete d autor de | | | | | | |
| Related subjects | | | | | | |
| Natao far tarth a l | | | | | | |
| NOTES FOR TEXTDOOK | | | | | | |
| Natao fan mefanan ac | | | | | | |
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| Ocole to be estimat | | | | | | |
| Goals to be achieved | | | | | | |
| Evolution of achievement | | | | | | |
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| Eveningtion | | | | | | |
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| By Report | | | | | | |
| Details of examination | | | | | | |
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| Other information | | | | | | |
| | | | | | | |
| Reference URL | | | | | | |
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| Office hours | | | | | | |
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| Relations to attainment objective | s of learning and e | ducation | | | | |
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| Kev words | | | | | | |
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(M45630290)Seismic Design of Structures[Seismic Design of Structures]

| Subject name[English] | Seismic Design of | f Structures[Seismi | c Design of Structur | res] | | |
|--|------------------------|----------------------|--------------------------|---------------------|-----------------|--|
| Schedule number | M45630290 | Subject area | Advanced | Required or | Flective | |
| | | | Architecture | elective | | |
| | | | and Own | 5165478 | | |
| | | | anu UIVII Engineering | | | |
| Time of statistics - | Eall to me | Davi of 1 | | 0 | 0 | |
| lime of starting a course | Fall term | Day of the | Wed.2~2 | Gredit(s) | 2 | |
| | a i i i | week,period | | | | |
| Faculty | Graduate Progran | n for Master's Degre | ee | Subject grade | 1~ | |
| Department Offered | Architecture and | Civil Engineering | | Beggining | M1, M2 | |
| | | | | grade | | |
| Charge teacher name[Roman | 齊藤 大樹 SAITO | OH Taiki | | | | |
| alphabet mark] | | | | | | |
| Numbering | | | | | | |
| Objectives of class | | | | | | |
| The chiestive of this class is the | learn the evoluat | tion mothed of stra | intural parformanas | of the building b | and on dynamia | |
| he objective of this class is to | | | ictural performance | of the building ba | ased on dynamic | |
| | | | | 6 H I H H H I | | |
| ine objective of this class is to | b learn the evaluat | ion method of stru | ictural performance | of the building ba | ased on dynamic | |
| benavior and ultimate strength ar | d detormation capa | acity. | | | | |
| Contents of class | | | | | | |
| 1. Basic concept of seismic desig | n of building | | | | | |
| 2. Force-deformation characteris | tics of building mat | erials | | | | |
| 3. Seismic evaluation method for | existing buildings | | | | | |
| 3-1. Screening method 1 | | | | | | |
| 3-2. Screening method 2 | | | | | | |
| 4. Post-seismic quick risk assess | ment of damaged b | uilding | | | | |
| | Ū | 0 | | | | |
| 1 Pasia concert of aciemic desig | n of building | | | | | |
| 1. Basic concept of seismic desig | | | | | | |
| 2. Force-deformation characteris | tics of building mat | erials | | | | |
| 3. Seismic evaluation method for | existing buildings | | | | | |
| 3–1. Screening method 1 | | | | | | |
| 3-2. Screening method 2 | | | | | | |
| 4. Post-seismic quick risk assess | ment of damaged b | uilding | | | | |
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| Self Preparation and Review | | | | | | |
| | | | | | | |
| Palated subjects | | | | | | |
| | | | | | | |
| None | | | | | | |
| None | | | | | | |
| Notes for textbook | | | | | | |
| | | | | | | |
| Notes for reference | | | | | | |
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| Goals to be achieved | | | | | | |
| To understand structured destruct | brough losusing the | | mothed of starstar | al mombor and kull | ling | |
| To understand structural design t | inrough learning the | seismic evaluation | method of structura | a member and build | ling. | |
| i o understand structural design t | nrougn learning the | e seismic evaluation | method of structura | ai member and build | ing. | |
| Evaluation of achievement | | | | | | |
| Report | | | | | | |
| Report | | | | | | |
| Examination | | | | | | |
| レポートで実施 | | | | | | |
| By Report | | | | | | |
| Details of examination | | | | | | |
| | | | | | | |
| Othor information | | | | | | |
| | | · (D D D D) | | | | |
| Protessor Taiki Saito (D805), e-m | nail: tsaito@ace.tut.a | ac.jp (Room: D-805) | | | | |
| Professor Taiki Saito (D805), e-mail: tsaito@ace.tut.ac.jp (Room: D-805) | | | | | | |
| Reference URL | | | | | | |

http://www.rc.ace.tut.ac.jp/saito/index-e.html http://www.rc.ace.tut.ac.jp/saito/index-e.html **Office hours** Please contact by e-mail to make an appointment. Please contact by e-mail to make an appointment.

Relations to attainment objectives of learning and education

Key words