■■ 科目名	
応用化学特別講義	

■■ 講義題目	
Leading and Advanced Materials Chemistry and Engineering IB - 2022	

■■ 責任教員（所属）	
島田　敏宏（大学院工学研究院）	

■■ 担当教員（所属）	
島田　敏宏（大学院工学研究院） 三浦　章（大学院工学研究院）	

■■ 科目種別			■■ 他学部履修等の可否	可
■■ 開講年度	2022	■■ 期間	通年不定期	■■ 時間割番号	094556
■■ 授業形態	講義	■■ 単位数	1	■■ 対象年次	～
■■ 対象学科・クラス			■■ 補足事項	Other Instructor: Wenhao SUN (University of Michigan)

■■ ナンバリングコード	
CHEM_ELCOM 6411	

■■ 大分類コード	■■ 大分類名称
CHEM_ELCOM	総合化学院(共通科目)

■■ レベルコード	■■ レベル
6	大学院（修士・専門職）専門科目（発展的な内容の科目、研究指導科目）

■■ 中分類コード	■■ 中分類名称
4	集中講義

■■ 小分類コード	■■ 小分類名称
1	応用化学特別講義

■■ 言語	
英語で行う授業	

■■ 実務経験のある教員等による授業科目	

■■ キーワード

materials informatics, python

■■ 授業の目標

The course provides lectures combined with exercises. In the lecture, basic knowledge of statistical methods and machine learning for materials research. In the exercises, we start from basic python programming and instruct how to use various libraries and databases. Participants will understand and experience the flow from data to new useful findings. After the training, state-of-the-art results will be given by a professor outside (Prof. Wenhao Sun, Univ. Michigan, USA) in the course.

到達目標

1. Understanding the basics of data science and machine learning, especially about terminology.
2. Learning how to use libraries and databases for python.
3. Practical usage of packages for materials informatics.

授業計画

1. What can we expect from data-science approach in chemistry and materials science.
2. Exercises of python programming.
3. Basics of informatics and machine learning approach.
4. Exercises using chemical and materials informatics packages.

準備学習(予習・復習)等の内容と分量

Requirement: personal computer equipped with a keyboard and internet connection
Homework: After each day, homework will be assigned. Students are graded based on the submitted homeworks and the final report.

成績評価の基準と方法

Students are requested to submit their programs and results prepared during the course.

有する実務経験と授業への活用

他学部履修の条件

テキスト・教科書

None

講義指定図書

Any textbooks or websites on python language, pandas, and pymatgen

参照ホームページ

This course will be provided as part of the Hokkaido Summer Institute.
For more information (invited lecturers, course details, etc.), please visit the website below:
https://hokkaidosummerinstitute.oia.hokudai.ac.jp/en/courses/CourseDetail=G063

研究室のホームページ

https://www.eng.hokudai.ac.jp/labo/kotai/en/index.html
https://www.eng.hokudai.ac.jp/labo/inorgsyn/cover-e.htm

備考

Required Equipment for a class (Laptop, etc.)
A computer with python installed. Instruction of installation will be given to registered students prior to the course.

更新日時

2022/03/01 11:49:01

■■ Course Title	
Advanced-Applied Chemistry	
■■ Subtitle	
Leading and Advanced Materials Chemistry and Engineering IB - 2022	
■■ Instructor (Institution)	
SHIMADA Toshihiro (Faculty of Engineering)	
■■ Other Instructors (Institution)	
SHIMADA Toshihiro (Faculty of Engineering) MIURA Akira (Faculty of Engineering)	

■■ Course Type			■■ Open To Other Faculties / Schools	OK
■■ Year	2022	■■ Semester	Full Year (Irregular)	■■ Course Number	094556
■■ Type of Class	Lecture	■■ Number of Credits	1	■■ Year of Eligible Students	～
■■ Eligible Department / Class			■■ Other Information	

■■ Numbering Code	CHEM_ELCOM 6411
■■ Major Category Code	■■ Major Category Title
CHEM_ELCOM	Chemical Sciences and Engineering_Elective Course for Common Subjects
■■ Level Code	■■ Level
6	Specialized Subjects (advanced) in graduate level (Master's Course and Professional Course)
■■ Middle Category Code	■■ Middle Category Title
4	
■■ Small Category Code	■■ Small Category Title
1	
■■ Language Type	
Classes are in English.	
■■ Course list by the instructor with practical experiences	

■■ Key Words

materials informatics, python

■■ Course Objectives

The course provides lectures combined with exercises. In the lecture, basic knowledge of statistical methods and machine learning for materials research. In the exercises, we start from basic python programming and instruct how to use various libraries and databases. Participants will understand and experience the flow from data to new useful findings. After the training, state-of-the-art results will be given by a professor outside (Prof. Wenhao Sun, Univ. Michigan, USA) in the course.

Course Goals

1. Understanding the basics of data science and machine learning, especially about terminology.
2. Learning how to use libraries and databases for python.
3. Practical usage of packages for materials informatics.

Course Schedule

1. What can we expect from data-science approach in chemistry and materials science.
2. Exercises of python programming.
3. Basics of informatics and machine learning approach.
4. Exercises using chemical and materials informatics packages.

Homework

Requirement: personal computer equipped with a keyboard and internet connection
Homework: After each day, homework will be assigned. Students are graded based on the submitted homeworks and the final report.

Grading System

Students are requested to submit their programs and results prepared during the course.

Practical experience and utilization for classes

Condition of tasking the subject

Textbooks

None

Reading List

Any textbooks or websites on python language, pandas, and pymatgen

Websites

This course will be provided as part of the Hokkaido Summer Institute.
For more information (invited lecturers, course details, etc.), please visit the website below:
https://hokkaidosummerinstitute.oia.hokudai.ac.jp/en/courses/CourseDetail=G063

Website of Laboratory

https://www.eng.hokudai.ac.jp/labo/kotai/en/index.html
https://www.eng.hokudai.ac.jp/labo/inorgsyn/cover-e.htm

■■ Additional Information

Required Equipment for a class (Laptop, etc.)
A computer with python installed. Instruction of installation will be given to registered students prior to the course.

■■ Update

2022/03/01 11:49:01