

<<Last Updated:2024/03/16>>

Course Schedule Information

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| Course Code | 88A076 |
| Semester | Winter Term |
| Day and Period | Other |
| Course Name (Japanese) | 化学基礎工学：分子集合体の基礎と応用 |
| Course Name | Introduction to Chemical Engineering Science: Basics and Applied Aspect of Molecular Self-Assembly |
| Capacity | 0 |
| Room | Online |
| Course Numbering Code | 88INES9U105 |
| Required/Optional | 学部1年次、特別聴講学生対象科目 On-demand/オンデマンド授業 |
| Type of Class | Lecture Subject |
| Credits | 1.0 |
| Student Year | 1 |
| Instructor | UMAKOSHI Hiroshi, MATSUBAYASHI Nobuyuki, NISHIYAMA Norikazu |
| Course of Media Class | Not Applicable |

※About Course of Media Class

"Course of Media Class" are classes in which more than half of the classes are held in places other than classrooms by making advanced use of various media.

Undergraduate students can include up to 60 credits in media class course as requirements for graduation.

Even if this is not the case, we may hold classes using the media.

Detailed Syllabus Information

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| Course Subtitle | Diversity of "Molecular Self-Assemblies" that Play an Active Role in Advanced Materials (Bio/Medical/Nano Materials) | |
| Language of the Course | English | |
| Learning Methods | Listening and watching face-to-face/online class: Listening and watching a lecture, video, or demonstration, face-to-face or via online (e.g., attending a face-to-face lecture, watching an on-demand video) Reading: Reading books and academic papers (e.g., summarizing an academic paper, reading information on a website) Presentation: Writing papers, making presentations, and creating works (e.g., report writing, oral/poster presentation, creation of works, portfolio development) | |
| Course Objectives | A variety of molecular self-assemblies that constitute the chemical processes are rich in diversity, such as micelles, bicelles, nanoemulsions, liposomes, vesicles, hexagonal assemblies, cubic assemblies, and lamellar assemblies. Molecular assemblies are not only used as important nano-chemical materials, but also applied to bio-/biomedical fields, such as nanocarriers in DDS, food engineering, and cosmetics. Series of lectures will be given focusing on cutting-edge research on the basics and applications of molecular assemblies from a chemical engineering perspective. | |
| Learning Goals | 1 | Students will be able to understand diversity of molecular self-assemblies |
| | 2 | Students will be able to understand three approaches (in Silico, Soft, Hard) systematically |
| | 3 | Students will be able to contrast the strategy of Chemical Engineering and Chemical Engineering Science |

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| | 4 | Students will be able to imagine how they could pioneer a new philosophy of their own |
| Requirements, Prerequisites | Nothing Special (Students do not have to study prior to this lecture.If possible, taking another course titled "Chemical Engineering Science" before and after the course will cultivate a broader perspective and way of thinking.) | |
| Attendance and Student Conduct Policy | Brief-Report, Brief Essay and Mini-examination are required. | |
| Class Plan | 1st | Title:Course Outline and Introduction of Molecular Self-Assembly |
| | | Basic Concept of Chemical Engineering Science) and Diversity of Molecular Self-Assembly in Advanced Science |
| | | Instructor : |
| | | Independent Study Outside of Class : If students read through the "Relating documents" before attending the on-demand type lecture, the students will deepen their understanding. |
| | 2nd | Title:"in-Silico" Molecular Self-Assembly: Fundamentals |
| | | Fundamentals of Molecular Self-Assembly Revealed by Computational Chemistry |
| | | Instructor : |
| | | Independent Study Outside of Class : If students read through the "Relating documents" before attending the on-demand type lecture, the students will deepen their understanding. |
| | 3rd | Title:"in-Silico" Molecular Self-Assembly: Application |
| | | Application of Molecular Self-Assembly Based on Computational Chemistry |
| | | Instructor : |
| | | Independent Study Outside of Class : If students read through the "Relating documents" before attending the on-demand type lecture, the students will deepen their understanding. |
| | 4th | Title:"Soft" Molecular Self-Assembly: Fundamentals |
| | | Fundamentals of meso-Scale Physicochemical Properties of Molecular Self-Assembly |
| | | Instructor : |
| | | Independent Study Outside of Class : If students read through the "Relating documents" before attending the on-demand type lecture, the students will deepen their understanding. |
| | 5th | Title:"Soft" Molecular Self-Assembly: Application |
| | | Design of Molecular Self-Assembly Based on meso-Scale Physicochemical Properties |
| | | Instructor : |
| | | Independent Study Outside of Class : If students read through the "Relating documents" before attending the on-demand type lecture, the students will deepen their understanding. |
| | 6th | Title:"Hard" Molecular Self-Assembly: Fundamentals |
| | | Fundamentals of Molecular Self-Assembly from the Viewpoint of Material Chemical Engineers |
| | | Instructor : |
| | | Independent Study Outside of Class : If students read through the "Relating documents" before attending the on-demand type lecture, the students will deepen their understanding. |
| | 7th | Title:"Hard" Molecular Self-Assembly: Application |
| | | Design of Functional Nano Materials Utilizing Molecular Self-Assembly |
| | | Instructor : |
| | | Independent Study Outside of Class : If students read through the "Relating documents" before attending the on-demand type lecture, the students will deepen their understanding. |
| Textbooks | Relating documents will be provided at each lecture. | |

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| Reference | References will be provided at each lecture in a "Further Reading" document. | | | | | |
| Grading Policy *Hover the mouse over the number of a learning goal to view the full text of it. | Evaluation Methods | Self-Feedback | Mini-Essay | Final exam | | |
| | Learning Goals1 | ○ | ○ | ○ | | |
| | Learning Goals2 | ○ | ○ | ○ | | |
| | Learning Goals3 | ○ | ○ | ○ | | |
| | Learning Goals4 | ○ | ○ | ○ | | |
| Allocation of Marks | 60% | 20% | 20% | | | |
| Additional Information on Grading | Brief-Report (Lecture (2)-(7)): 60%, Mini-Essay (Lecture (1)): 20%, Mini-Examination: 20% | | | | | |
| Reasonable Accommodation | <ul style="list-style-type: none"> • If you need reasonable accommodation to participate in this class due to disability (including intractable disease and chronic condition), please contact the office for students with disabilities (e.g., Educational Affairs Section, Academic Affairs Section, Student Affairs Section) at your school/faculty or graduate school, or the Disability Advisory and Support Service Office of the Health and Counseling Center. • For more information, please visit the following website or contact the Disability Advisory and Support Service Office of the Health and Counseling Center. Website : https://acs.hacc.osaka-u.ac.jp Tel : 06-6850-6107 E-mail : campuslifekenkou-ac@office.osaka-u.ac.jp | | | | | |
| Special Note | All the lectures will be given "on-demand" by using Osaka University CLE. So, students will be able to join to this course at any time during the "Winter" term (in OU academic calendar). However, students will have to pay their attentions to "Deadline" of "Brief-Report", "Mini-Essay", and "Mini-Examination". All of them would be automatically closed after the deadline. | | | | | |
| Office Hours | Friday 17:00-18:00 (JST) But, "commenting" at the "free comment column" at "Brief-Report" and "Mini-Essay" is recommended because this class will be held at "on-demand" style | | | | | |
| Course Conducted by Instructors with Practical Experience | | | | | | |

Instructor(s)

| Instructor Name | Name (hiragana) | Affiliation, Title, Course | Office | Extension | E-mail |
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| Hiroshi UMAKOSHI | うまこし ひろし | Professor, Bio-Inspired Chemical Engineering Gr., Grad. Sch. of Engineering Science | C-329 | 6287 | umakoshi.hiroshi.es@osaka-u.ac.jp |

Cautions for Students

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