

Special Subjects of the Department of Functional Molecular Science

Field	Subject Code	Subject	Credit	Content of subject	
Functional Biomolecular Science	20DFM001	Functional Biomolecular Science	2	1. Basic and applications of solution and solid-state NMR spectroscopy in structural analyses of biomolecules 2. Basic of microscopy, Single-molecule imaging, Optical tweezers, Magnetic tweezers, Super resolution microscopy, High-speed atomic force microscopy 3. Functional mechanisms of biomacromolecules including glycoproteins, membrane proteins, and multidomain proteins, Working mechanisms of motor proteins, Molecular basis of protein assembly	Ryota Iino Koichi Kato Katsuyuki Nishimura
Complex Catalysis	20DFM002	Complex Catalysis	2	Molecular structures and functions of complex catalysts will be overviewed based on the understanding the features of transition metal catalysis, Lewis acid-Lewis base catalysis, and organo catalysis in catalytic molecular transformations.	Yasuhiro Uozumi Norie Momiyama
Quantum dynamics	20DFM003	Quantum dynamics	2	Lecture on principles of direct observation and control of ultrafast quantum dynamics of matter (in femto- and attosecond time scale) by using light and recent experimental trials in the relevant field.	Kenji Ohmori
Photo-physics	20DFM004	Photo-physics	2	Laser technologies, photo-electronics, photo-material science, basic knowledges of optics and electromagnetic radiation from relativistic electron beams (synchrotron radiation, free electron lasers) will be described.	Members of dept. of functional molecular science
Molecular Functional Materials	20DFM005	Molecular Functional Materials	2	In this lecture, one of the following topics will be delivered : Solid state physics and fundamental knowledge of electronic properties measurement and device physics for molecular solids.	Masahiro Hiramoto Tetsuro Kusamoto
Common Courses	90DFM001	Exercise on Functional Molecular Science I	4	Discussion, experimental instructions, and/or theoretical studies for the student to perform the individual fundamental and applied research in the field of functional molecular science. This program is provided by appropriate teaching stuffs based on the research subject.	
	90DFM002	Exercise on Functional Molecular Science II	4		
	90DFM003	Exercise on Functional Molecular Science III	4		
	90DFM004	Exercise on Functional Molecular Science IV	4		
	90DFM005	Exercise on Functional Molecular Science V	4		
	90DFM006	Seminar on Functional Molecular Science I	4	Small size seminar to gain scientific knowledge, competence for scientific consideration, discussion, and research performance, and origina scientific conceptions in the field of fundamental and applied functional molecular science. This program is provided by appropriate teaching stuffs molecular science. This program is provided by appropriate teaching stuffs based on the research subject of the individual student.	
	90DFM007	Seminar on Functional Molecular Science II	4		
	90DFM008	Seminar on Functional Molecular Science III	4		
	90DFM009	Seminar on Functional Molecular Science IV	4		
	90DFM010	Seminar on Functional Molecular Science V	4		
	10DFM001	English for scientific research	2	The principal aim of this course is to improve academic reading, acadimic writing, listenig, and speaking in English for scientific research.	Sechrist, Jeremiah S Members of dept. of functional molecular science