

2026 年度シラバス

科目分類/Subject Categories			
学部等/Faculty	/大学院工芸科学研究科（博士前期課程）： /Graduate School of Science and Technology (Master's Programs)	今年度開講/Availability	/有 : /Available
学域等/Field	/物質・材料科学域 : /Academic Field of Materials Science	年次/Year	/1～2年次 : /1st through 2nd Year
課程等/Program	/機能物質化学専攻 : /Master's Program of Functional Chemistry	学期/Semester	/秋学期 : /Fall term
分類/Category	/授業科目 : /Courses	曜日時限/Day & Period	/ : /

科目情報/Course Information				
時間割番号 /Timetable Number				
科目番号 /Course Number	61960022			
単位数/Credits	2			
授業形態 /Course Type	講義 : Lecture			
クラス/Class				
授業科目名 /Course Title	Nano-Biomaterials and Laboratory : Nano-Biomaterials and Laboratory			
担当教員名 / Instructor(s)	/ベニス大学教員（機能物質化学専攻ダブル・ディグリープログラムコース） : Related teacher of Ca' Foscari University of Venice (Double Degree Program course in the Master's Program of Functional Chemistry)			
その他/Other	インターンシップ実施科目 Internship	国際科学技術コース提供科目 IGP	PBL 実施科目 Project Based Learning	DX 活用科目 ICT Usage in Learning
	実務経験のある教員による科目 Practical Teacher			
科目ナンバリング /Numbering Code				

授業の目的・概要 Objectives and Outline of the Course	
日	
英	The course will provide the basic knowledge and tools for designing, engineering and optimizing nanostructures and smart materials, mainly applied in the biomedical field. At the end of the course the student is expected to master the basic principle of designing, engineering and optimization of nanostructures and to screen the best device/technique for the related each application.

学習の到達目標 Learning Objectives	
日	
英	know the basic knowledge and tools for designing, engineering and optimizing nanostructures and smart materials master the basic principle of designing, engineering and optimization of nanostructures and to screen the best device/technique

学習目標の達成度の評価基準 / Fulfillment of Course Goals (JABEE 関連科目のみ)	
日	
英	

授業計画項目 Course Plan		
No.	項目 Topics	内容 Content

1	日 英	Introduction to bionanotechnology	Introduction to bionanotechnology
2	日 英	Biosensors and surface functionalization	Biosensors and surface functionalization
3	日 英	Bioimaging	Bioimaging
4	日 英	Drug delivery and theranostics	Drug delivery and theranostics
5	日 英	Rigenerative medicine	Rigenerative medicine
6	日 英	3D printing	3D printing
7	日 英	Non-medical field of applications	Non-medical field of applications
8	日 英	The Lab section (1)	Lecture on regulatory affairs of bionanomaterials, from PHASE 1 to the market
9	日 英	The Lab section (2)	Virtual Lab, from NPs synthesis to in vivo imaging (JOVE and recorded videos)
10	日 英	The Lab section (3)	Movie on Ethic, they grey zones of data
11	日 英	The Lab section (4)	Case Study presentations from students (10 min each on a specific application of bionanomaterials)
12	日 英	The Lab section (5)	Visit of Nanomnia Start-up, Lab experiments and lectures
13	日 英	Presentation and discussion (1)	Oral power point presentation on a case study
14	日 英	Presentation and discussion (2)	Oral power point presentation on a case study
15	日 英	Examination	Written examination

履修条件 Prerequisite(s)

日	
英	

授業時間外学習（予習・復習等）

Required study time, Preparation and review

日	
英	Biomolecular technology Chemistry of bionanomaterials and lab

教科書／参考書 Textbooks/Reference Books

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英	Nanobiotechnology: Bioinspired Devices and Materials of the Future, ISBN-10 : 1617378305, Humana Pr Inc., 2010
	Nanomedicine and Nanobiotechnology di Stergios Logothetidis, ISBN-10 : 3642432662, Springer 2014

成績評価の方法及び基準 Grading Policy	
日	
英	Written examination Oral power point presentation on a case study

留意事項等 Point to consider	
日	
英	