

## 2025 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	/独立専攻：/Fibro/BBM	年次/Year	/1～2年次：/1st through 2nd Year
課程等/Program	/先端ファイブ科学専攻：/Master's Program of Advanced Fibro-Science	学期/Semester	/秋学期：/Fall term
分類/Category	/授業科目：/Courses	曜日時限/Day & Period	/集中：/Intensive

科目情報/Course Information				
時間割番号 /Timetable Number	65119922			
科目番号 /Course Number	65160213			
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	インテリジェントテキスタイル：Intelligent Textiles			
担当教員名 / Instructor(s)	/(芳田 哲也)/(Lieva Van Langenhove)/(PRINIOTAKIS Georgios)：YOSHIDA Tetsuya/Lieva Van Langenhove/PRINIOTAKIS Georgios			
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	M_AF6121			

授業の目的・概要 Objectives and Outline of the Course	
日	<p>Keywords: Definitions, sensing, data processing, actuation, storage, communication, concepts, release mechanisms, micro-encapsulation, electrotexiles, optical fibres</p> <p>Final competences:</p> <p>1 Know the concepts : passive smart, active smart, very smart; evolution; sensing, data processing, actuation, storage, communication; examples; smart suits of the future; mechanical actuators, chemical actuators, concepts, release mechanisms; colour change; micro-encapsulation; electrotexiles, optical fibres; functional textiles; smart textiles.</p> <p>2 Obtain an understanding of functional textile materials; obtain knowledge of smart and functional textile materials and structures and their basic materials, to convert classical devices into fibre based structures.</p>
英	<p>Keywords: Definitions, sensing, data processing, actuation, storage, communication, concepts, release mechanisms, micro-encapsulation, electrotexiles, optical fibres</p> <p>Final competences:</p> <p>1 Know the concepts : passive smart, active smart, very smart; evolution; sensing, data processing, actuation, storage, communication; examples; smart suits of the future; mechanical actuators, chemical actuators, concepts, release mechanisms; colour change; micro-encapsulation; electrotexiles, optical fibres; functional textiles; smart textiles.</p> <p>2 Obtain an understanding of functional textile materials; obtain knowledge of smart and functional textile materials and structures and their basic materials, to convert classical devices into fibre based structures.</p>

学習の到達目標 Learning Objectives	
日	Obtain an understanding of functional textile materials.

英	Obtain an understanding of functional textile materials.
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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	Definition, evolution and functions of Smart Textiles 1	Definition, evolution and functions of Smart Textiles 1
	英	Definition, evolution and functions of Smart Textiles 1	Definition, evolution and functions of Smart Textiles 1
2	日	Definition, evolution and functions of Smart Textiles 2	Definition, evolution and functions of Smart Textiles 2
	英	Definition, evolution and functions of Smart Textiles 2	Definition, evolution and functions of Smart Textiles 2
3	日	Electroconductive textiles 1	Electroconductive textiles 1
	英	Electroconductive textiles 1	Electroconductive textiles 1
4	日	Electroconductive textiles 2	Electroconductive textiles 2
	英	Electroconductive textiles 2	Electroconductive textiles 2
5	日	Sensors: electrical, optical 1	Sensors: electrical, optical 2
	英	Sensors: electrical, optical 1	Sensors: electrical, optical 1
6	日	Sensors: electrical, optical 1	Sensors: electrical, optical 2
	英	Sensors: electrical, optical 1	Sensors: electrical, optical 2
7	日	Actuators: mechanical, chemical, thermal, optical, electrical 1	Actuators: mechanical, chemical, thermal, optical, electrical 1
	英	Actuators: mechanical, chemical, thermal, optical, electrical 1	Actuators: mechanical, chemical, thermal, optical, electrical 1
8	日	Actuators: mechanical, chemical, thermal, optical, electrical 2	Actuators: mechanical, chemical, thermal, optical, electrical 2
	英	Actuators: mechanical, chemical, thermal, optical, electrical 2	Actuators: mechanical, chemical, thermal, optical, electrical 2
9	日	Energy: batteries, energy scavenging (from heat, light, deformation) 1	Energy: batteries, energy scavenging (from heat, light, deformation) 2
	英	Energy: batteries, energy scavenging (from heat, light, deformation) 1	Energy: batteries, energy scavenging (from heat, light, deformation) 1
10	日	Energy: batteries, energy scavenging (from heat, light, deformation) 1	Energy: batteries, energy scavenging (from heat, light, deformation) 2
	英	Energy: batteries, energy scavenging (from heat, light, deformation) 2	Energy: batteries, energy scavenging (from heat, light, deformation) 2
11	日	Communication: textile antennae 1	Communication: textile antennae 1
	英	Communication: textile antennae 1	Communication: textile antennae 1
12	日	Communication: textile	Communication: textile antennae 2

		antennae 2	
	英	Communication: textile antennae 2	Communication: textile antennae 2
13	日	Components of smart textiles, textile integration 1	Components of smart textiles, textile integration 1
	英	Components of smart textiles, textile integration 1	Components of smart textiles, textile integration 2
14	日	Components of smart textiles, textile integration 2	Components of smart textiles, textile integration 2
	英	Components of smart textiles, textile integration 1	Components of smart textiles, textile integration 2
15	日	Components of smart textiles, textile integration 3	Components of smart textiles, textile integration 3
	英	Components of smart textiles, textile integration 3	Components of smart textiles, textile integration 3

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	Initial competences: • Bsc level in mathematics, organic chemistry, physical chemistry, general process engineering, textile technology and materials engineering
英	Initial competences: • Bsc level in mathematics, organic chemistry, physical chemistry, general process engineering, textile technology and materials engineering

教科書／参考書 Textbooks/Reference Books	
日	Fibres to Smart Textiles -Advances in Manufacturing, Technologies, and Applications 1st Edition-, Edited ByAsis Patnaik, Sweta Patnaik, ISBN 9781138332515
英	Fibres to Smart Textiles -Advances in Manufacturing, Technologies, and Applications 1st Edition-, Edited ByAsis Patnaik, Sweta Patnaik, ISBN 9781138332515

成績評価の方法及び基準 Grading Policy	
日	End-of-term evaluation Examination methods in case of periodic evaluation during the first examination period: Written Examination Examination methods in case of periodic evaluation during the second examination period: Written Examination During exami
英	End-of-term evaluation Examination methods in case of periodic evaluation during the first examination period: Written Examination Examination methods in case of periodic evaluation during the second examination period: Written Examination During exami

留意事項等 Point to consider	
日	Teaching language is English. Intensive course
英	Teaching language is English. Intensive course