

## 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	65119921			
科目番号 /Course Number	65160211			
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	テクニカルテキスタイルの製造技術：Technical Textile Manufacturing Technology			
担当教員名 / Instructor(s)	/大谷 章夫/(Cornelia Sennewald)：OHTANI Akio/Cornelia Sennewald			
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_AF6131			

授業の目的・概要 Objectives and Outline of the Course	
日	<p>Concentrating on manufacturing technical textiles is a key issue.</p> <p>Keywords: Manufacturing, weaving, knitting, braiding processes, testing, properties, structures, constructions, applications</p> <p>Final competences:</p> <p>1 Terms:</p> <ul style="list-style-type: none"> <li>• viscose processes, polyester, polyamide</li> <li>• weaving, knitting, braiding processes</li> <li>• applications</li> <li>• testing, properties</li> <li>• fundamentals, structures</li> <li>• fundamentals, constructions</li> </ul> <p>2 Insights:</p> <ul style="list-style-type: none"> <li>• concentrating on manufacturing technical textiles is a key issue</li> </ul> <p>3 Skills:</p> <ul style="list-style-type: none"> <li>• be able to give an overview of the manufacturing of technical textiles</li> </ul>
英	<p>Concentrating on manufacturing technical textiles is a key issue.</p> <p>Keywords: Manufacturing, weaving, knitting, braiding processes, testing, properties, structures, constructions, applications</p> <p>Final competences:</p> <p>1 Terms:</p> <ul style="list-style-type: none"> <li>• viscose processes, polyester, polyamide</li> </ul>

	<ul style="list-style-type: none"> <li>• weaving, knitting, braiding processes</li> <li>• applications</li> <li>• testing, properties</li> <li>• fundamentals, structures</li> <li>• fundamentals, constructions</li> </ul> <p>2 Insights:</p> <ul style="list-style-type: none"> <li>• concentrating on manufacturing technical textiles is a key issue</li> </ul> <p>3 Skills:</p> <ul style="list-style-type: none"> <li>• be able to give an overview of the manufacturing of technical textiles</li> </ul>
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学習の到達目標 Learning Objectives	
日	Be able to give an overview of the manufacturing of technical textiles.
英	Be able to give an overview of the manufacturing of technical textiles.

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	
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授業計画項目 Course Plan			
No.		項目 Topics	内容 Content
1	日	PART A - Introduction 1	All textiles are made of fibres or yarns. For technical textiles, special products with special mechanical properties are used. Typical examples are viscose, polyester and polyamide, aramide, carbon, glass and metal fibres and yarns. • Man-made fibre sp
	英	PART A - Introduction 1	All textiles are made of fibres or yarns. For technical textiles, special products with special mechanical properties are used. Typical examples are viscose, polyester and polyamide, aramide, carbon, glass and metal fibres and yarns. • Man-made fibre sp
2	日	PART A - Introduction 2	All textiles are made of fibres or yarns. For technical textiles, special products with special mechanical properties are used. Typical examples are viscose, polyester and polyamide, aramide, carbon, glass and metal fibres and yarns. • Market overview
	英	PART A - Introduction 2	All textiles are made of fibres or yarns. For technical textiles, special products with special mechanical properties are used. Typical examples are viscose, polyester and polyamide, aramide, carbon, glass and metal fibres and yarns. • Market overview
3	日	PART A - Man-made fibres from cellulosic materials 1	• Viscose fibres: Chemical reactions, production technology, products, properties.
	英	PART A - Man-made fibres from cellulosic materials 1	• Viscose fibres: Chemical reactions, production technology, products, properties.
4	日	PART A - Man-made fibres from cellulosic materials 2	• Lyocell fibres: Basics, production technology, products, properties.
	英	PART A - Man-made fibres from cellulosic materials 2	• Lyocell fibres: Basics, production technology, products, properties.
5	日	PART A - Synthetic man-made fibres 1	• Spinning processes and machines • Plant design
	英	PART A - Synthetic man-made fibres 1	PART A - Synthetic man-made fibres 1
6	日	PART A - Synthetic man-made fibres 2	• Polyester and polyamide: chemistry, processes, properties, applications.
	英	PART A - Synthetic man-made fibres 2	• Polyester and polyamide: chemistry, processes, properties, applications.
7	日	PART A - High-performance	• Carbon, aramide, glass, steel

		fibres 1	
	英	PART A - High-performance fibres 1	<ul style="list-style-type: none"> <li>Carbon, aramide, glass, steel</li> </ul>
8	日	PART A - High-performance fibres 2	<ul style="list-style-type: none"> <li>Production processes, properties, applications</li> </ul>
	英	PART A - High-performance fibres 2	<ul style="list-style-type: none"> <li>Production processes, properties, applications</li> </ul>
9	日	PART B - Introduction 1	<p>A lot of textiles are used in technical applications. Some prominent examples are geotextiles, medical textiles and textiles in automotive engineering.</p> <ul style="list-style-type: none"> <li>definition, reasons for global expansion, global and European market developments</li> </ul>
	英	PART B - Introduction 1	<p>A lot of textiles are used in technical applications. Some prominent examples are geotextiles, medical textiles and textiles in automotive engineering.</p> <ul style="list-style-type: none"> <li>definition, reasons for global expansion, global and European market developments</li> </ul>
10	日	PART B - Introduction 2	<p>A lot of textiles are used in technical applications. Some prominent examples are geotextiles, medical textiles and textiles in automotive engineering.</p> <ul style="list-style-type: none"> <li>systematics of application fields</li> </ul>
	英	PART B - Introduction 2	<p>A lot of textiles are used in technical applications. Some prominent examples are geotextiles, medical textiles and textiles in automotive engineering.</p> <ul style="list-style-type: none"> <li>systematics of application fields</li> </ul>
11	日	PART B - Overview of the manufacturing of technical textiles, the basic properties of the fabrics and their application 1	<ul style="list-style-type: none"> <li>the methods and the manufacturing technologies for yarns for technical textiles</li> <li>warp knitting technology, including stitch-bonding technology for non crimp fabrics, but also spacer fabrics and special articles</li> </ul>
	英	PART B - Overview of the manufacturing of technical textiles, the basic properties of the fabrics and their application 1	<ul style="list-style-type: none"> <li>the methods and the manufacturing technologies for yarns for technical textiles</li> <li>warp knitting technology, including stitch-bonding technology for non crimp fabrics, but also spacer fabrics and special articles</li> </ul>
12	日	PART B - Overview of the manufacturing of technical textiles, the basic properties of the fabrics and their application 2	<ul style="list-style-type: none"> <li>weft knitting technology, especially such with weft and warp insertion</li> <li>weaving</li> <li>braiding</li> </ul>
	英	PART B - Overview of the manufacturing of technical textiles, the basic properties of the fabrics and their application 2	<ul style="list-style-type: none"> <li>weft knitting technology, especially such with weft and warp insertion</li> <li>weaving</li> <li>braiding</li> </ul>
13	日	PART B - Overview of the manufacturing of technical textiles, the basic properties of the fabrics and their application 3	<ul style="list-style-type: none"> <li>tailored fibre placement</li> <li>nonwoven production</li> </ul>
	英	PART B - Overview of the manufacturing of technical textiles, the basic properties of the fabrics and their application 3	<ul style="list-style-type: none"> <li>tailored fibre placement</li> <li>nonwoven production</li> </ul>
14	日	PART B - Methods for developing technical textiles as well as intellectual property protection 1	<ul style="list-style-type: none"> <li>methods for solution finding and evaluation of such solutions</li> <li>protecting intellectual property</li> </ul>
	英	PART B - Methods for developing technical textiles as well as intellectual property protection 1	<ul style="list-style-type: none"> <li>methods for solution finding and evaluation of such solutions</li> <li>protecting intellectual property</li> </ul>
15	日	PART B - Methods for developing technical textiles as well as intellectual property protection 2	<ul style="list-style-type: none"> <li>patent search project</li> <li>case study "developing technical textiles"</li> </ul>

	英	PART B - Methods for developing technical textiles as well as intellectual property protection 2	<ul style="list-style-type: none"> <li>• patent search project</li> <li>• case study “developing technical textiles”</li> </ul>
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履修条件 Prerequisite(s)	
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授業時間外学習（予習・復習等） Required study time, Preparation and review	
日	Initial competences: <ul style="list-style-type: none"> <li>• Bsc level in mathematics, organic chemistry, physical chemistry, general process engineering, textile technology and materials engineering</li> </ul>
英	Initial competences: <ul style="list-style-type: none"> <li>• Bsc level in mathematics, organic chemistry, physical chemistry, general process engineering, textile technology and materials engineering</li> </ul>

教科書／参考書 Textbooks/Reference Books	
日	Advanced Technical Textile Products 1st Edition, By Xiaoming Tao, ISBN 9780415479233 by CRC Press
英	Advanced Technical Textile Products 1st Edition, By Xiaoming Tao, ISBN 9780415479233 by CRC Press

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