

群馬工業高等専門学校		開講年度	令和05年度 (2023年度)		授業科目	Advanced Engineering Materials	
科目基礎情報							
科目番号	131			科目区分	専門 / 選択		
授業形態	授業			単位の種別と単位数	学修単位: 2		
開設学科	環境工学専攻			対象学年	専1		
開設期	後期			週時間数	2		
教科書/教材	Handouts and electronic files						
担当教員	ルカノフ アレクサンダー,Olaf Karthaus,橋本 修一						
到達目標							
As part of promoting internationalization of our KOSEN, this lecture will be given in English. A wide range of topics will be covered from basic engineering materials to advanced materials from cutting-edge research fields.							
<input type="checkbox"/> To be able to understand principles by listening lectures given in English.							
<input type="checkbox"/> To be able to ask questions and answer queries in English regarding lecture materials.							
<input type="checkbox"/> To be able to grasp and understand topics related to advanced materials research that are attracting attention worldwide.							
ルーブリック							
	理想的な到達レベルの目安			標準的な到達レベルの目安		未到達レベルの目安	
評価項目1	To understand the contents of lectures on materials in English sufficiently.			To understand the contents of lectures on materials in English.		The content of the lectures is poorly understood.	
評価項目2	To be able to ask questions and respond appropriately in English.			Excellent performance in asking questions or answering queries in English.		Poor performance in asking questions or answering queries in English.	
評価項目3	To be able to grasp and fully understand topics related to advanced materials research that are attracting worldwide attention.			To be able to grasp and understand topics related to advanced materials research that are attracting worldwide attention.		Poor performance in grasping and understanding topics related to advanced materials research that are attracting worldwide attention.	
学科の到達目標項目との関係							
教育方法等							
概要	All the lectures on advanced materials are given in English in order to promote students performance in international atmosphere. In addition to lectures by a full-time teachin staff, lectures by foreign researchers (remote lectures by part-time lecturers) will be conducted. A wide range of topics will be covered, from basic scicence and engieering on materials to introductory advanced materials.						
授業の進め方・方法	The lectures will be given by full-time lecturer using slides and handouts. Foreign researchers will give remote lectures in real time using Teams, Zoom, etc.						
注意点	Students are expected to actively involved in asking questions in English during the lecture time and try to deepen their own understanding.						
授業の属性・履修上の区分							
<input type="checkbox"/> アクティブラーニング		<input type="checkbox"/> ICT 利用		<input type="checkbox"/> 遠隔授業対応		<input type="checkbox"/> 実務経験のある教員による授業	
授業計画							
		週	授業内容		週ごとの到達目標		
後期	3rdQ	1週	Learn about Engineering Materials in English		To understand expressions in scientific English.		
		2週	Nanomachines and Nanorobotics as Next Generation Drugs for Precision Medicine		To understand nanomachines and nanorobotics as next generation drugs for precision medicine.		
		3週	Metabolic Labeling of Genomic DNA in the Living Cell		To understand metabolic labeling of genomic DNA in the living cell.		
		4週	Sensors and Bioindicators for Environmental Monitoring		To understand sensors and bioindicators for environmental monitoring.		
		5週	Sustainable Ecotechnologies for Environmental Protections.		To understand sustainable ecotechnologies for environmental protections.		
		6週	Environmental Chemistry: Accumulation and Transformation of the Pollutants in Nature		To understand environmental chemistry: accumulation and transformation of the pollutants in nature.		
		7週	Single-Molecule Tracking and Imaging of Molecular Dynamics in Living Cells		To understand single-molecule tracking and imaging of molecular dynamics in living cells.		
		8週	Nanobiotechnological Approaches for Purification of Industrial Contaminated Effluents		To nanobiotechnological approaches for purification of industrial contaminated effluents.		
	4thQ	9週	Nanotechnology-Based Drug Delivery Systems		To understand nanotechnology-based drug delivery systems.		
		10週	Self-Organization to Fabricate Polymer Microstructures		To understand self-organization to fabricate polymer microstructures.		
		11週	Non-Linear Dynamic Processes in Polymer Solutions to Prepare Ordered		To understand non-linear dynamic processes in polymer solutions to prepare ordered.		
		12週	Biomimetics of Pollen Particles		To understand biomimetics of pollen particles.		
		13週	Hybrid Materials containing Natural Polymers		To understand hybrid materials containing natural polymers.		
		14週	Plastic Degradation and Microplastics		To understand plastic degradation and microplastics.		
		15週	Biomimetics of Flower Petals		To understand biomimetics of flower petals.		

		16週					
評価割合							
	試験	発表	相互評価	態度	ポートフォリオ	レポート	合計
総合評価割合	40	0	0	0	0	60	100
基礎的能力	10	0	0	0	0	20	30
専門的能力	20	0	0	0	0	20	40
分野横断的能力	10	0	0	0	0	20	30
	0	0	0	0	0	0	0