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Bas c I fo at o					
* Course Name	Chinese				
	English Fundamental of Intelligent Manufacturing in Materials Processing				
* Credits	3	* Teaching Hours	48 1 =16		
* Semester	Fall	* Cross-semester?	No		
* Course Type	Program Core Course	* Course Type	For full-time students		
* Course Category	Specialized Course	Targeting Students	All graduates		
* Instruction Language	Chinese	Teaching Method	In class teaching		
* Grade	Letter grading	Exam Method	Essay		
* School					
Subject					
Person in charge	Name	ID	School	E-mail	
				ycai@sjtu.edu.cn	

E te ded I fo at o	
* ( ) Course Description	200 4.0 +
* English Course Description	The intelligent manufacturing of material processing based on information technology is an Interdisciplinary course. It integrates human sensory information (visual, auditory, tactile), experience knowledge (control of shape and performance), reasoning judgment (knowledge learning, reasoning and decision making), and process control and optimization. The course focuses on the elementary segments and nowadays frontiers of intelligent manufacturing. The core technologies, including cyber-physical system, artificial intelligence technology, industrial large data and cloud computing are systematically introduced. The structure and technical features

	of industrial 4.0 and intelligent factories are analyzed. Some application cases, such as the flexible manufacturing workshop and mixed (material adding + material reduction) intelligent system are studied as examples. The application status and prospect of intelligent manufacturing in the field of material hot processing are introduced.
* ( ) Syllabus	

[1] ◆ ◆ ◆ ◆	3		
[2] ◆ ◆ ◆ ◆	6		
[3] ◆ 3C(Computer, Communication, Control) ◆	6		
[4] 4.0 ◆ ◆ ◆ ◆ 4.0	9		
[5] ◆ ◆ ◆ ◆ ◆	9		
[6] ◆ ◆ ◆ ◆	9		
[7] ◆ ◆ ◆ +	6		

* English Syllabus	

Content	Hours	Mode	Instructor
[1] overview of intelligent manufacturing ◆ What is intelligent manufacturing? ◆ Features and development direction of Intelligent Manufacturing Technology ◆ Application status and Prospect of Intelligent Manufacturing in material hot processing ◆ The road of Intelligent Manufacturing in China	3	Lecture	Prof. Xueming Hua
[2] Intelligent manufacturing technology and system ◆ Architecture of intelligent manufacturing system ◆ Product life cycle management system ◆ Production execution system ◆ Information physical system	6	Lecture	Prof. Xueming Hua
[3] Information physical system ◆ Organic integration and deep collaboration of 3C (computer, communication, control) technology ◆ Real time perception, dynamic control and information mining of large engineering systems	6	Lecture	Prof. Xueming Hua
[4] Industry 4.0 and smart factories ◆ Industrial robot ◆ Flexible production line ◆ The Internet of things and digital workshop ◆ Industry 4.0 and intelligent factory	9	Lecture Technical visit	Prof. Xueming Hua
[5] Artificial intelligence technology ◆ The basic principles of artificial intelligence ◆ Knowledge representation and reasoning method ◆ Machine vision technology ◆ In depth learning technology ◆ The application of artificial intelligence in material processing	9	Lecture discussion	Prof. Yan Cai

	[6] Industrial big data and cloud computing ◆ Industrial big data ◆ Cloud computing technology ◆ Data mining technology ◆ The virtual manufacturing technology	9	Lecture practice	Prof. Yan Cai
	[7] Intelligent manufacturing application case ◆ The optimization of manufacturing process based on big data mining ◆ Flexible intelligent manufacturing workshop ◆ Intelligent manufacturing technology of mixing (additive + subtraction)	6	Lecture Discussion practice	Prof. Yan Cai

* Requirements	50 10%+ 30%+ 60%
* English Requirements	The course is assessed by comprehensive scoring method, with the specific proportion of 10% of usual performance + 30% of homework + 60% of course design. The usual performance includes attendance, classroom Q & A. The course design includes project scheme design and implementation, report and communication, and a complete written report.
* Resources	◆ . 2018 ◆ . 2017 ◆ . 2016 ◆ Ian Goodfellow, Yoshua Bengio . , 2017,
* English Resources	◆ Fang Wang, Zhongning Zhao. Intelligent manufacturing foundation and application, 2018, China Machine Press ◆ Jianrong Tan. Intelligent Manufacturing: key technologies and enterprise applications, 2017, China Machine Press ◆ Ming Chen. The way of Intelligent Manufacturing: digital chemical plant, 2016, China Machine Press ◆ Ian Goodfellow, Yoshua Bengio. Deep Learning, 2017, people's post and Telecommunications Press
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