

# 上海交通大学研究生专业课程信息收集表

## Information Form for SJTU Graduate Profession Courses

课程基本信息 Basic Information				
*课程名称 Course Name	现代塑性成形技术与装备 Modern Technology and Equipment of Plastic Forming			
*学分 Credits	2	*学时 Teaching Hours	32 (1 学分=16 课时)	
*开课学期 Semester	春季学期 Spring	*是否跨学期 Cross-semester?	否 No	跨 Spanning over 个学期 Semesters (含夏季学期)。
*课程类型 Course Type	专业选修课 Program Elective Course	*课程分类 Course Type	全日制课程 For full-time students	
*课程性质 Course Category	专业课 Specialized Course	课程层次 Targeting Students	硕博共用 All graduates	
*授课语言 Instruction Language	中文 Chinese	主要授课方式 Teaching Method	课堂教学 In class teaching	
*成绩类型 Grade	等第制 Letter grading	主要考核方式 Exam Method	其它 Other	
*开课院系 School	050 材料科学与工程学院 School of Material Science and Engineering			
所属学科 Subject	材料科学与工程 Material Science and Engineering			
负责教师 Person in charge	姓名 Name	工号 ID	单位 School	联系方式 E-mail
	于沪平		塑性成形技术与装备 研究院	yuhp@sjtu.edu.cn
	刘娟		塑性成形技术与装备 研究院	liujuan@sjtu.edu.cn
课程扩展信息 Extended Information				
*课程简介 (中文) Course Description	<p>(分段概述课程定位、教学目标、主要教学内容、先修课程等；不少于 200 字。)</p> <p>现代塑性成形技术与装备是塑性成形方向研究生深入掌握了解塑性成形工艺本质的课程，通过本课程的学习和讨论，可以掌握在具体工艺中，如何综合分析缺陷的生产原因以及如何解决缺陷的方案；针对基本的冲压工艺，列举具体案例以了解和掌握零件成形的工艺拟订过程、模具设计等内容。课程中对冲裁、弯曲、拉深、自由锻、模锻等诸多均进行从原理到工艺的具体解析，并进行相关的工艺、模具诸方面的讲解；同时，也涉及到材料性能与</p>			

	成形性能的关系。致力于学生创造能力的提高。				
*课程简介 (English) Course Description	Metal forming is a basic course of metal plastic deformation technology and methods. This course includes the analysis and discussion of several basic plastic forming processes. It will describe the basic processes and dies of plastic forming technology and the key points in metal material forming. It will focus on the relationship between material properties and material processing properties, and the impact of each process on the environment and cost. The aim is to develop students' ability to design and optimize the forming processes for complex metal parts based on environmentally friendly and sustainable development.				
*教学大纲 (中文) Syllabus	周次	教学内容	授课学时	教学方式	授课教师
	1	绪论, 金属板料成形特点, 工艺简介, 设备特点比较; 适用领域; 最小阻力原理等	2	授课	于沪平
	2-3	冲裁工艺及模具, 断裂分离原理, 冲裁间隙的确定, 冲裁力的计算, 冲裁件的工艺性分析; 模具的基本结构	4	授课	于沪平
	4-5	弯曲件工艺, 最小弯曲半径概念; 弯曲方式; 回弹的因素及控制措施; 弯曲模具结构	4	授课	于沪平
	6	拉深工艺分析, 起皱及拉裂的原因及防止措施; 拉深系数的概念	2	授课	于沪平
	7-8	多次拉深工艺, 拉深系数调整原则; 模具工作部分的设计; 综合工艺解析; 简单模、连续模及复合模特点及分类; 连续模设计要点, 复合模设计要点	4	授课	于沪平
	9	绪论: 锻造工艺现状及发展趋势; 热锻工艺特点;	2	授课	刘娟
	10	自由锻成形机理和工艺规范制订; 工艺难点及缺陷分析; 案例及讨论	2	授课	刘娟
	11-12	模锻分类; 模锻图的制订步骤及方法; 锻件毛坯图的制订, 预锻与终锻模腔设计; 典型案例分析	4	授课	刘娟
	13-14	现代特种锻造: 辊锻、环轧、多向锻造、粉末锻造等及课堂讨论	4	授课	刘娟
	15-16	大塑性变形及晶粒控制、外场辅助成形: 电场、磁场等	4	授课	刘娟
*教学大纲 (English) Syllabus	Week	Content	Hours	Format	Instructor
	1	Introduction: sheet forming characteristics, process and equipment, applicable fields, principle of minimum resistance,	2	Teaching	Yu Huping

		etc			
	2-3	Blanking and die design, fracture separation principle, blanking clearance determination, blanking force prediction, technological analysis of blanking parts; die structure design	4	Teaching	Yu Huping
	4-5	Bending process, minimum bending radius; bending mode; springback control; bending die structure design	4	Teaching	Yu Huping
	6	Deep drawing process, Wrinkle and fracture prediction and measures; drawing coefficient	2	Teaching	Yu Huping
	7-8	Multiple drawing process, drawing coefficient adjustment; die design; comprehensive process analysis; simple die, drawing die classification; continuous die design, composite die design	4	Teaching	Yu Huping
	9	Research status and development trend of forging, characteristics of hot forging,	2	Teaching	Liu Juan
	10	open die forging forming mechanism and process specification for upsetting and stretching, large forging manufacturing	2	Teaching	Liu Juan
	11-12	Die forging: Classification of die forgings, drawing of die forgings draft, design of blank cavity and forming cavity, structural design of forging die	4	Teaching	Liu Juan
	13-14	Special forging: Precision die forging, roll forging, ring rolling, wedge rolling, radial forging, multiple forging, powder forging, etc.	4	Teaching	Liu Juan
	15-16	Super plastic deformation and	4	Teaching	Liu Juan

		grain control, electric and magnetic field assisted forming etc			
*课程要求 (中文) Requirements	(课程考核方式、考核标准等; 不少于 50 字) 1) 多次课后工艺设计作业, 占 25% 2) 课堂考勤及课堂讨论, 占 25% 3) 两人一组进行新工艺 PPT 展示, 占 25% 4) 小论文整理, 占 25%				
*课程要求 (English) Requirements	(须与中文一致, 翻译请力求信达雅。) Comprehensive scores including multiple assignments (25%), discussions (25%), presentation (25%) and essays (25%)				
*课程资源 (中文) Resources	1) 塑性成形工艺及模具设计, 高锦章主编, 机械工业出版社; 2) 冲压手册, 王孝培主编, 机械工业出版社; 3) 锻压工艺学, 王祖堂主编, 机械工业出版社; 4) 锻造工艺学, 吕炎, 机械工业出版社 5) 精密塑性成形工艺, 夏巨谔主编, 机械工业出版社				
*课程资源 (English) Resources	1) Gao Jinzhang, Plastic forming technology and die design, China machine press; 2) Wang Xiaopei, Stamping manual, China machine press; 3) Wang Zutang, Forging technology, China machine press; 4) Lv Yan, Forging technology, China machine press 5) Xia Jushen, Precision plastic forming process, China machine press				
备注 Note					