



UNIVERSITI TEKNOLOGI MARA

PST632: MOULD AND DIE DESIGN

Course Name (English)	MOULD AND DIE DESIGN APPROVED
Course Code	PST632
MQF Credit	4
Course Description	This course covers the basic principles employed to practically design a mould for a standard plastic injection moulding process. It begins with an overview of the injection moulding process, the machine and the basic functions of an injection mould. Throughout the semester, the students are required to design a product and its mould utilising computer aided drawing programmes. Consequently, this course will enable students to comprehend all aspects for a successfully injection mould design.
Transferable Skills	Computer Aided Drawing
Teaching Methodologies	Lectures, Lab Work, Demonstrations, Field Trip, Directed Self-learning
CLO	CLO1 Describe the tasks and requirements of a mould in injection moulding process. CLO2 Explain the procedures and principles involved in mould and die design. CLO3 Design a simple plastic product and its two-plate mould. CLO4 Present an own design mould CLO5 Describe the tasks and requirements of an extrusion die.
Pre-Requisite Courses	No course recommendations
Topics	
1. Review of Injection Moulding Process 1.1) Steps in injection mouldings 1.2) Parameters setting	
2. Injection Moulding Machine 2.1) Machine types 2.2) Machine components 2.3) Specifications and selection	
3. Functions of an Injection Mould 3.1) Fundamental tasks 3.2) Mechanical tasks	
4. Product design for Injection Moulding 4.1) Filling and Packing: wall thickness distribution 4.2) Cooling consideration: wall thickness 4.3) Ejection consideration: undercut and draft angle 4.4) Cooling consideration: wall thickness 4.5) Pressure, Volume and Temperature relationships 4.6) Cavity/Impression Shrinkage	
5. Material for Injection Moulds 5.1) Material properties 5.2) Material selections	
6. Mechanical Consideration 6.1) Force, stress and deformations 6.2) Mould base selection	
7. Mould making techniques 7.1) Casting and Hobbing 7.2) Machining processes	

<p>8. Design of Feed System</p> <p>8.1) Locating Ring and Sprue Bush selection 8.2) Gating 8.3) Runner 8.4) Cavity layout 8.5) Design considerations: Type, location and dimensions</p>
<p>9. Venting of moulds</p> <p>9.1) Active and Passive venting system 9.2) Design considerations: Type, location and dimensions</p>
<p>10. Cooling System</p> <p>10.1) Standard cooling components 10.2) Design considerations: Type, location and dimensions</p>
<p>11. Ejection</p> <p>11.1) Types of ejector 11.2) Ejection force and contact area calculation 11.3) Ejector pin selections 11.4) Design considerations: Type, location and dimensions</p>
<p>12. Mould Maintenance</p> <p>12.1) Maintenance requirements 12.2) Mould cleaning processes</p>
<p>13. Die Design. Types of die, component and function</p> <p>13.1) Types of extrusion die: Profile, Sheet/Film, Blown film 13.2) General design considerations</p>

Assessment Breakdown	%
Continuous Assessment	60.00%
Final Assessment	40.00%

Details of Continuous Assessment	Assessment Type	Assessment Description	% of Total Mark	CLO
	Individual Project	Students are required to design a simple plastic product and its two plate mould using computer aided drawing software.	40%	CLO3
	Presentation	Powerpoint presentation	10%	CLO4
	Test	Past year examinations	10%	CLO1

Reading List	Recommended Text	Reference Book Resources
	<ul style="list-style-type: none"> • Georg Menges, Walter Michaeli, Paul Mohren 2001, <i>How to Make Injection Molds</i>, 3rd Ed., Hanser Verlag [ISBN: 1-56990-282-8] • Peter Jones, <i>The Mould Design Guide</i>, 1st Ed., Smithers Rapra Technology Limited Shawbury, UK [ISBN: 9781847350879] • Herbert Rees 2001, <i>Understanding Injection Mold Design</i>, Hanser Verlag [ISBN: 1-56990-311-5] 	<ul style="list-style-type: none"> • Potsch, G., Michaeli, W. 1995, <i>Injection Molding: an Introduction</i>, Ed., , Hanser, Munich, New York. [ISBN:] • , <i>Arburg Injection Moulding Guide</i>, Ed., , [ISBN:] • Robert A. Malloy 1994, <i>Plastic Part Design for Injection Molding</i>, Hanser Verlag [ISBN: 1569901295] • Erhard, G. 2006, <i>Designing with Plastics</i>, Hanser, Munich, New York.

Article/Paper List	This Course does not have any article/paper resources
Other References	This Course does not have any other resources