

**JABATAN/DEPARTMENT OF MECHANICAL ENGINEERING  
RANGKA KURSUS/ COURSE OUTLINE/SSG**

1.	NAME OF COURSE	TOOL DESIGN																
	COURSE CODE	DJF51092 Version: 230419_2 Effective: Session I 2021/2022																
2.	SYNOPSIS	TOOL DESIGN exposes the students to the knowledge of datum concept, geometric tolerances and fundamentals to design tool based on clamping and locating principle. The topics also covers the principle of tool applications in metal and non-metal process. All the topics discussed will enable the students to plan and identify the use of tooling. They will also be exposed to the application of tooling in related industries.																
3.	CREDIT VALUE	2																
4.	PREREQUISITE/ CO-REQUISITE (IF ANY)	None																
	COURSE LEARNING OUTCOMES (CLO): Upon completion of this course, students should be able to:																	
	CLO1	Apply appropriately the concepts of tool design method and tooling material selection in designing tools. (C3, PLO2)																
	CLO2	Perform 3D design of mould, tool and die design using CAD software. (P4, PLO3)																
	CLO3	Demonstrate conviction towards environment and sustainability to complete assigned tasks during practical work sessions. (A3, PLO7)																
5.	PROGRAMME LEARNING OUTCOMES (PLO):																	
	PLO 2: Identify and analyse well-defined engineering problems reaching substantiated conclusions using codified methods of analysis specific to their field of activity (DK1 to DK4)																	
	PLO 3: Design solutions for well-defined technical problems and assist with the design of systems, components or processes to meet specified needs with appropriate consideration for public health and safety, cultural, societal, and environmental considerations (DK5)																	
	PLO 7: Understand and evaluate the sustainability and impact of engineering technician work in the solution of well-defined engineering problems in societal and environmental contexts (DK7)																	
6.	ASSESSMENT METHOD: The course assessment consists of:																	
	i. Continuous Assessment (CA) – 100%																	
	<table border="1"> <thead> <tr> <th>Assessment</th> <th>Quantity</th> <th>Percentage (%)</th> </tr> </thead> <tbody> <tr> <td>Quiz</td> <td>2</td> <td>10%</td> </tr> <tr> <td>Test</td> <td>1</td> <td>20%</td> </tr> <tr> <td>Project</td> <td>2</td> <td>50%</td> </tr> <tr> <td>Presentation</td> <td>2</td> <td>20%</td> </tr> </tbody> </table>			Assessment	Quantity	Percentage (%)	Quiz	2	10%	Test	1	20%	Project	2	50%	Presentation	2	20%
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	ii. Final Examination (FE) – None Final examination / Final assessment is carried out at the end of the semester.																	

TEACHING SCHEDULE:					
Topic No.	Topic/Content	Recommended Contact Hours	Assessment Method	Week	
7.	1.0	Tool Design Method 1.1 Apply tool design procedure a. The stage of tool design procedure 1.2 Apply drafting and design techniques in tooling drawing	2.5 hours Lecture		W1
	2.0	Tooling Material 2.1 Elaborate the properties of materials 2.2 Relate between heat treatment and tooling design 2.3 Use tool material in tooling design	2.25 hours Lecture	Quiz 1	W1 – W2
	3.0	Mould 3.1 Compare injection mould in plastic process 3.2 Apply mould design in initial considerations 3.3 Sketch types of injection mould 3.4 Complete mould designing 3.5 Perform 3D design of two-plate injection mould 3.6 Describe the sustainable elements to increases tool life and awareness of environment	17.25 hours Lecture	Test 1  Project 1	W2 – W8
	4.0	Tool and Die 4.1 Discuss Die cutting operations 4.2 Expose the types of Die in manufacturing process 4.3 Complete the Die designing 4.4 Perform 3D design of blanking dies 4.5 Describe the sustainable elements to increases tool life and awareness of environment	17 hours Lecture	Quiz 2  Project 2	W8 – W14
8.	REFERENCES	<p><b>Main reference supporting the course</b></p> <p>Kazmer, D. O. (2016). Injection Mold Design Engineering. Munich: Hanser Publications</p> <p><b>Additional references supporting the course</b></p> <p>Jones, P. (2008). The Mould Design Guide. Shawbury : Smithers Rapra Technology Limited</p> <p>Kibbe, R. R., Meyer, R. O., Stenerson, J., &amp; Curran, K. (2019). Machine Tool Practices. Upper Saddle River: Pearson.</p> <p>Nee, J. G., Dufraine, W., Evans, J. W., &amp; Hill, M. (2010). Fundamentals Of Tool Design. Dearborn (Michigan): Society of Manufacturing Engineers. Statics 4th Edition. John Wiley &amp; Sons, New York</p>			

Prepared by:



( KHAIRIL BIN CHE MAT )

Date : 25/08/2023

Verified by :



( Tandatangan dan Nama TPA/KJ/KPro/KK )

**MOHD HELMI BIN SALLEH**

Ketua Jabatan

Jabatan Kejuruteraan Mekanikal

Politeknik Muadzam Shah

Pahang Darul Makmur

Date : 25/08/2023