

Engineering Program

Specialization Production and Computer Aided Manufacturing Technology
Course Number 020202142
Course Title **Machining Technology Workshop**
Credit Hours (2)
Theoretical Hours (0)
Practical Hours (6)

Brief Course Description:

Operating different kinds of machine tools (Drilling, Turning, Milling, Grinding) safely and be able to trouble shoot machining problems, Introduction to conventional machining operations: turning, milling, shaping, grinding. Cutting tools: drills, turning tools, milling tools, shaping tools and sharpening tools. Work piece fixing. Grinding wheels. CAD/CAM

Course Objectives:

At the end of this course student will be able to:

1. Setup and operate lathe machine
2. Straight & facing turning
3. Taper turning, knurling, & threading
4. Setup and operate milling machine
5. Milling Flat surface bevels, Grooves & keyways
6. Drilling & boring and chamfers
7. Dividing & indexing on milling machine
8. Setup and operate shaping machine
9. Planning flat surface bevels, Grooves & keyways
10. Grinding drills & turning tools

Detailed Course Description:

Number	Title	Content	Time
	Drilling	Types and mounting of twist drills Sharpening of twist drills Reaming Principles of safety for drilling processes	
	Turning	Mantling and dismantling [chucks (three, 4- jaw, collets, spindle, step), tailstock] Centering work piece in the chucks and between centers, face plate Install cutting tools Operate the machine External & internal turning process ~ Straight turning & facing ~ boring ~ Taper turning ~ Threading ~ knurling Different types of lathes and their components Cutting tools Mounting of work pieces on lathes Longitudinal, face, and internal turning Taper turning Internal and external thread cutting Eccentric Turning	
	Milling	Different types of milling machines and their components	

		<p>Milling cutting tools (milling cutters) and their uses</p> <p>Mounting and of milling cutters</p> <p>Manufacturing of flat surfaces of specified dimensions</p> <p>Grooving</p> <p>Using dividing tool</p> <p>Gear cutting</p> <p>Mantling and dismantling (cutter arbor, machine vice, vertical head, dividing –head)</p> <p>Install cutting tools with arbors, holders, adapters</p> <p>Operate the machine heads & movements</p> <p>Install work-piece with vises& holding devices</p> <p>Milling process</p> <p>< Flat surface bevels, and chamfers</p> <p>< Grooves & keyways</p> <p>< Drilling & boring</p> <p>< Dividing & indexing</p>	
	Shaping & planning	<p>Mantling and dismantling (machine vice)</p> <p>Install cutting tools with arbors, holders, adapters</p> <p>Operate the machine heads & movements</p> <p>Install work-piece with vises & holding devices</p> <p>Shaping process</p> <p>< Flat surface bevels, and chamfers</p> <p>< Grooves & keyways</p>	
	Grinding	<p>Balancing and Mantling grinding wheels</p> <p>Operate the machine</p> <p>Grinding process</p> <p>< Drills</p> <p>< Lathe tools</p> <p>Grinding wheels</p> <p>Mounting arrangements</p> <p>Grinding of flat surfaces</p> <p>External grinding of cylindrical surfaces</p> <p>Internal grinding of cylindrical surfaces</p>	

Evaluation Strategies:

Evaluation		Percentage	Date
Exams	Midterm	20%	
	Final Exam	50%	
Projects and Assignments and reports		30%	

Teaching Methodology:

- Lecturing
- Technical videos watching
- Workshop practicing

Text Books & References:

Text Books:

- Provided workshop manual and related supplemental sheets
- Groover, Fundamentals of Modern Manufacturing, 4th Ed
- قطع المعادن، شادي أبو سريس

References:

- تقنية التشغيل (عملي)، الإدارة العامة لتصميم وتطوير المناهج، المؤسسة العامة للتعليم الفني والتدريب المهني، المملكة العربية السعودية

- Kalpakjian, Manufacturing Engineering and Technology, 6th Edition in Si Units