

Program : Diploma in Engineering and Technology	
Course Code : 2009	Course Title: Engineering Workshop Practice
Semester : 1 & 2	Credits: 1.5
Course Category: Engineering Science	
Periods per week: 3 (L: 0 T: 0 P: 3)	Periods per semester: 45 + 45

Course Objectives:

- To familiarize safety precautions practiced in the workplace.
- To prepare drawings models for fabrication.
- To identify various measuring, marking, holding, striking, and cutting tools & equipment.
- To practice electrical wiring and soldering.
- To prepare a drawing of models for fabrication.
- To operate machines, power tools, and equipment safely.

Course Prerequisites:

Topic	Course code	Course name	Semester
Trigonometry and other basic mathematics principles		Mathematics I & II	1 & 2
Principles of electrical conductivity and basics of electronics		Applied Physics I & II	1 & 2
Geometric constructions and projections		Engineering Graphics	1

Course Outcomes:

On completion of the course, the student will be able to:

CO _n	Description	Duration (Hours)	Cognitive Level
CO1	Identify the safety precautions, tools and devices required to make carpentry joints	18	Applying

CO2	Make use of various tools, machines, instruments and power tools used in the Fitting shop to make fitting joints	18	Applying
CO3	Make use of various tools, machines, instruments and power tools used in the Welding shop to make welding joint.	18	Applying
CO4	Utilize different sheet metal tools and measuring instruments to make sheet metal joints.	18	Applying
CO5	Make use of various tools and accessories to practice electrical wiring, motor connection and soldering	18	Applying

CO – PO Mapping

Course Outcomes	PO1	PO2	PO3	PO4	PO5	PO6	PO7
CO1	3						
CO2	3						
CO3	3						
CO4	3						
CO5	3						

3-Strongly mapped, 2-Moderately mapped, 1-Weakly mapped

Course Outline

Module Outcomes	Description	Duration (Hours)	Cognitive Level
CO1	Identify the safety precautions, tools and devices required to make carpentry joints		
M1.01	i) Explain safety precautions ii) Demonstrate various wood working Tools/equipment and power tools.	3	Understanding
M1.02	Demonstrate various wood working process like Marking, Planning, Cutting, Chiseling, Grooving.	3	Understanding
M1.03	Construct a simple joint like open halved joint	12	Applying
Contents: Awareness of safety measures : Personal safety, Machine safety and Job safety			

Marking and measuring tools: Steel rule -Measuring tape-straight edge mitre square- try square- bevel square -combination square- marking knife marking gauge- mortise gauge- wing compass- divider- outside and inside calipers.

Cutting tools: Hand saw- Tenon saw-firmer chisel- bevel edge firmer chisel parting chisel- mortise chisel- jack plane- wooden and metal- trying plane smoothing plane- rebate plane- spoke shave.

Boring tools: Bradawl ratchet brace- wheel brace.

Striking tools: Mallet-Claw hammer.

Holding devices: Carpenters Bench vice-bench stop-sash clamp-G-clamp.

Miscellaneous tools: Rasp cut file- scraper-pincers-ratchet and screw drivers Oil stone- Saw set.

Power tools: Circular saw- Planer machine- Router- Portable Drilling machine

Carpentry Practice: Measuring-Marking and Cutting practice- Planning practice-and Chiseling practice -Open halved joints (T joint/Cross halved Joint)

CO2	Make use of various tools, machines, instruments and power tools used in the Fitting shop to make fitting joints		
M2.01	i) Explain safety precautions ii) Demonstrate various tools, machines, instruments and power tools used in the Fitting shop.	3	Understanding
M2.02	Demonstrate various operations like Measuring, Marking, Cutting, and Filing.	3	Understanding
M2.03	Construct a simple fitting joint involving measuring, Marking, Cutting and Filing.	12	Applying

Contents:

Hand tools & Marking tools: Scriber- compass- dividers- outside and inside caliper- jenny caliper –Vernier height gauge-ordinary scribing block- universal scribing block- angle plate-V-block- centre punch- prick punch- try square bevel square- surface plate.

Cutting tools: Hack saw -solid and adjustable frames – blades -chisels – flat crosscut- half round- diamond point- side chisel- Files – single cut and double cut files rough- bastard-second cut- smooth Dead smooth files – flat- square pillar- round triangular- half round-knife- safe edge and needle files.

Striking tools: Hammer-Ball peen- straight peen- cross peen.

Holding devices: Vice-bench- pipe- hand- pin and tool makers vice Power tools: Chop saw- Drilling machine.

Fitting Practice: Measuring- Marking and Cutting - filing- simple joints exercises(L joint /T joint/V joint)

CO3	Make use of various tools, machines, instruments and power tools used in the Welding shop to make welding joint.		
M3.01	i) Explain safety precautions ii) Demonstrate various tools/equipment and protecting devices used in welding shop.	3	Understanding

M3.02	Demonstrate an Arc welding machine, electrodes, earthing cable, poles etc. and practice on welding machine	3	Understanding
M3.03	Construct Straight line welding and Butt joint Welding.	12	Applying
<p>Contents: Familiarization of welding tools: Study of various tools and equipment used in the welding shop-Face shield/helmet-Apron-Gloves-Goggles-Wire brush Chipping hammer-Tongs-Steel rule-Scriber-Try square-File-Angle grinder Arc Welding Machine-Electrode-Electrode holder- Earth clamp. Welding Practice: Edge preparation- straight line welding practice- Square butt joint</p>			
CO4	Utilize different sheet metal tools and measuring instruments to make sheet metal joints.		
M 4.01	i) Explain safety precautions ii) Demonstrate various tools/equipment used in sheet metal shop.	3	Understanding
M 4.02	Demonstrate Sheet Metal operations like sheet Cutting, Bending and Edging.	3	Understanding
M 4.03	Construct Simple joints involving sheet metal operations.	12	Applying
<p>Contents: Familiarization of Sheet metal tools: Scribers- dividers- trammel points- set square-punches – prick punches- centre punches – hand Grover- rivet- set chisels hammers- riveting hammers- ball peen hammers- mallet- snip- shear-spliers- hand reamers -files- stakes. Measuring instruments: Folding rule-common rule- steel rule-circumference rule-Vernier Calipers- micrometre- Standard wire gauge (SWG). Sheet Metal Practice : Sheet cutting- folding- locked grooved joint- Paned down and knocked up joint-Double grooved joint</p>			
CO5	Make use of various tools and accessories to practice electrical wiring, motor connection and soldering		
M5.01	i) Explain safety precautions ii) Demonstrate various tools and accessories required for Electrical wiring.	3	Understanding
M5.02	Explain wiring materials generally used.	3	Understanding
M5.03	Develop a circuit and wire up to control one lamp by one switch in conduit wiring.	3	Applying
M5.04	i) Develop a circuit and wire up for stair case for one lamp by two switches. ii) Make a connection of single phase /three phase induction motor with DOL starter.	6	Applying

M5.05	Demonstrate soldering iron and flex. Make simple circuit using soldering of electrical/ electronic components.	3	Applying
<p>Contents: Electrical Safety Precautions. Familiarization of Electrical wiring tools: Combination plier- Cutter- Nose plier- Wire stripper- Tester- Screw driver- Connector- Pocker- Hammer- Mallet-Wire gauge- Soldering Iron- Tweezer- desoldering pump- Ammeter- Voltmeter- Multi meter- Energy meter. Wiring Practice: Practice on simple lamp circuits- one lamp by one switch in conduit wiring, stair case for one lamp by two switches-Connection of single phase or three phase induction motor with DOL starter - simple circuit using soldering of electrical/ electronic components.</p>			

**Note: The CIA shall be arranged in both the semesters by the faculty in charge.
The ESE shall be conducted at the end of second semester**

Text / Reference

T/R	Book Title / Author
T1	S.K.Hajara Chaudhary, Workshop Technology, Median Promoters and publishers, New Delhi 2015.
T2	J B Gupta Electrical Installation Estimation and Costing, Kataria, S. K., & Sons
R1	B.S. Raghuwanshi, Workshop Technology, Dhanpat Rai and sons, New Delhi 2014
R2	K. Venkat Reddy, Work Practice Manual, BS Publications, Hyderabad 2014
R3	Kents Mechanical Engineering Hand Books, John Wileynand sons, New York