DETAILED SYLLABUS

FOR

DESTANCE EDUCATION

CERTIFICATE IN WELDER MECHINIC (CWM)

(YEARLY SYSTEM)

COURSE TIILE : CWM
DURATION : 02 YEARS
TOTAL DEGREE MARKS : 800
MODE : YEARLY

COURSE TITLE : CWM
DURATION : 1YEARS
MODE : YEAR
TOTAL DEGREE MARKS : 400

FIRST YEAR

Course Title	Paper Code	Marks				
		Theory		Practical		Total
		Internal	External	Inter-nal	External	
TRADE THEORY	CWM/Y/110	40	60	00	00	100
WORKSHOP CALU.& SECINCE	CWM/Y/120	40	60	00	00	100
ENGENEERING DRAWING	CWM/Y/130	40	60	00	00	100
PRACTICAL	CWM/Y/140	00	00	40	60	100

TRADE THEORY **CODE: CWM/Y/110**

S.NO.	THEORY
1 General discipline in the institute: -----	Elementary First Aid—Importance of Welding in Industy—Safety in Manual Metal Arc Welding — Safety in Oxy-Acetylene Welding and Cutting— Marking and Measuring Tools.
2 Gas Welding Hand Tools: ---	Uses Care and Maintenance—Various Welding Processes –
3 Different Process of metal joining---	Bolting-Riveting--Soldering-Brazing-etc
4 Oxy-Acetylene Cutting Equipment—	Principle and Application—their care and Maintenance.
5 Simple Electrical terms and their definition—	Uses of Electricity as applied to Welding Electricity -AC-DC- Type of electric Welding and application
6 Common Gases used for Welding—	Oxygen, Hydrogen, Acetylene. Coal gas etc. Types of oxy-acetylene flames—their setting—uses— various gas combinations—flame temperatures and their uses.
7 Nomenclature of welding joints—	Terms applied to each joints—Explanation with simple sketches-- Welding symbols
8 Principals of Arc Welding—	Necessity of Welding machines—Type of machines– construction—care and maintenance.
9 Acetylene—	Its properties—acetylene Generators carbide to water type—Working principle- care and maintenance. Comparison of two types of generators. Acetylene purifier—hydraulic back pressure valve.
10 Arc and its characteristics	-arc length types uses advantage and disadvantages. Polarity — types—method of identification-uses of each type.
11 Safety precaution in welder shop—	Steel rule type—punches Try square—Scriber-- and its uses. —
12 Chisel—	Type and construction Hacksaw Frame Blade- and its type---Hammer –Vice and Clams and its uses.
13 Oxygen--	Its properties Manufacturing methods oxygen cylinder—D.A. cylinder- Description-care and maintenance.
14 Welding positions—	Flat--Horizontal—vertical and over-head-slope and. rotation electrodes—type—object of flux coating— Criteria for choice of electrodes

15 Regulators—

-Types---Construction and uses. Care and maintenance. Welding blow pipes—types-- care and maintenance. Difference between H.P &L.P. system.

16 Effect of Moisture on Electrodes—

Necessity and importance of baking electrodes before use—storage condition and handling of electrodes for better welding quality.

17 Fault in gas welding—

Definition of faults, their effects—causes—corrections. Manifold system ---operations—limitation--- care and maintenance.

18 Arc Blow—

Definition—its causes and effects—method of overcome in practice— Fault in arc welding –causes and correction of each fault.

19 Welding Technique—

Right hand—left hand explanation—method—linde welding—application.

20 Sheet Metal Shop Safety rules—

Measuring tools—marking tools—sheet metal hammers—Pullers—punches. Grooves—rivet set and uses-type of sheets—soft solder and soldering process.

21 Development of Parallel line method

Examples Taper tray and different elbow and pipes—hand liver shears—Guillotine shearing machine-circular cutting—machine parts.

21 Method employed to control distortion in **Gas welding—**

Stress relieving-outdoor method—edge preparation—methods –applications.

22 Welding of M.S. Pipes—

Difference between pipe and plate welding—pipe development 90 degree and 45 degree branch pipe.

23 Specification for filler rods and wires For gas welding—

Effect of atmosphere on Metals. Use of welding flux and rod for different methods—effect of alloying element on weld ability.

24 Resistance welding—

Principle of Resistance welding –types application, Advantages—laser beam welding and cutting --Principle of laser beam.

25 Modern welding Process—

Submerged Arc welding-- Principle of Process Equipment used weld Procedure—advantage—Advantages limitations.

WORKSHOP CALCULATION & SCIENCE **CODE: CWM/Y/120**

(MACHINAL TRADE ONLY)

1 UNITS:-

Introduction--Definition--classification of units—interrelationship between Metric and British System of units

2 SIMPLIFICATION:-

Introduction--fractions--decimal fractions--lowest common multiple, LCM.

3 SQUARE ROOT:-

Square and square root--symbol of root--method of finding out the squire root of a number--factorization method--division method.

4 RATIO AND PROPORTION:-

Introduction--ratio--proportion-

5 PERCENTAGE:-

Introduction--percentage method

6 ALGEBRA:-

Introduction-careful consideration of subject items--addition and subtraction--multiplication and division--algebraic formulae- factorization—equations

7 MENSURATION:-

Introduction-rectangle--square--parallelogram— rhombus--trapezium--triangles--circle

8 TRIGONOMETRY:-

Definition--formula--measurement of angles--

9 METALS:-

Introduction--properties of metal--types of metals--ferrous metals— cast iron-steel- ferrous metals

10 HEAT TREATMENT:-

Introduction--purposes of heat treatment--processes of heat treatment

11 FORCE:-

Newton's law of motion--space diagram--vector diagram

12 MOMENT AND LEVER:-

Moment--unit--lever

13 SIMPLE MACHINES:-

Efficiency of machine--effort and load—mechanical advantage--velocity ratio--out and in put

14 WORK, POWER AND ENERGY:-

Work--unit of work--power--unit of power- energy--uses of energy--

15 FRICTION:-

Introduction--advantage and disadvantage of friction—normal reaction--limiting friction

16 VELOCITY AND SPEED:-

Rest and motion--speed--velocity--acceleration—motion under gravity

ENGINEERING DRAWING **CODE CWM/Y/130**

(MACHINAL TRADE ONLY)

1 INTRODUCTION, DRAWING INSTRUMENTS AND MATERIALS:-

Introduction—Drawing—drawing board—set-square— instrument box—pencil—rubber—drawing sheet--

2 CONVENTIONS FOR LINES, MATERIALS AND BREAKS:-

Introduction—convention for lines—grouping of lines—conventional breaks

3 FREE HAND LETTERING AND SKETCHING:-

Introduction—lettering—type of lettering—free hand sketching--

4 GEOMETRICAL DRAWING:-

Introduction—points—line—curved line—angle—circle—square—rectangle--

5 SCALE:-

Introduction—plain scale—diagonal scales—comparative scales— venire scales--

6 ISOMETRIC PROJECTION:-

Introduction—isometric projection—axis—lines--

7 ORTHOGRAPHIC PROJECTION AND IDENTIFICATION OF SURFACES:-

Introduction—projection—pictorial projection—orthographic projection—first angle projection—third angle projection--

8 BLUE PRINT READING:-

Introduction—blue print—some important conventions— diameter—radius—

9 WELD AND WELDED JOINTS:-

Introduction—lap joint—butt joint—edge joint—corner joint—tee joint--

10 HAND TOOLS:-

Hammers—files—pipe wrench—pliers—spanner—hacksaws— drilling machines—screw driver—tester—chisel—try-square—vice—etc.

PRACTICAL **CODE: CWM/Y/140**

1 Introduction of Trade and safety precautions
2 Welding shop tools
3 Welding process and their classification
4 gases used in welding
5 High pressure and low pressure
6 gas welding fault
7 Type of welding joints
8 gas welding of various metals
9 Soldering and brazing
10 Metal cutting by gas flame
11 Hard facing
12 Heat and Temperature
13 Pipe welding - gas & arc
14 Electric arc welding
15 Resistance welding
16 Arc welding of different Metals