

MNPE-09425068494

In Collaboration with

**Karnataka State Open
University**

Manasagangotri, Mysore-6

Syllabus
Certificate in Fitter & Fabricator

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Certificate in Fitter & Fabricator Program Structure (Face to Face)

ELIGIBILITY - 10th Class pass under 10+2 system.

COURSE PERIOD: SIX MONTHS

TOTAL MARKS : 600

TOTAL SEMESTER : 1

SUBJECT TITLE	SUBJECT CODE	MARKS		
		Theory	Practical	Total
BASIC FITTING WORKS	CFF-101	50	50	100
TURNING WORKS	CFF-102	50	50	100
MILLING WORKS	CFF-103	50	50	100
PIPE FABRICATION	CFF-104	50	50	100
WORKSHOP CALCULATION & SCIENCE	CFF-105	50	50	100
PRACTICAL	CFF-106		100	100

1 ST SEMESTER		
CODE	COURSE TITLE	CREDIT
CFF101	BASIC FITTING WORKS	3
CFF 102	TURNING WORKS	3
CFF 103	MILLING WORKS	3
CFF 104	PIPE FABRICATION	3
CFF 105	WORKSHOP CALCULATION & SCIENCE	3
CFF 106	PRACTICAL	3
TOTAL CREDIT :		18

DETAILED SYLLABUS

CFF 101: BASIC FITTING WORKS

Total Credit: 3

Block 1

Unit 1

- Safety precautions, use of protective clothing and elementary first aid.

Unit 2

- Functions and uses of various tools and equipment.

Unit 3

- Reasons for carrying out good housekeeping practices

Unit 4

- Care and use of tools, equipment and materials used in fitting

Block 2

Unit 1

- Selection and correct use of tools

Unit 2

- Criteria for selection of tool for different operation

Unit 3

- Proper handling and correct use of hand tools

Unit 4

- Types of measuring tools

Block 3

Unit 1

- Least count and errors
- Measurement procedures
- Safety precautions related to measuring tools

Unit-2

- Selection of marking media. Proper handling and use of marking and punching tools.
- Criteria for selection of grinder. Methods of holding the of tools and job. Safety consideration in grinding operation

Unit -3

- Types of files in grade shape and cut.
- Proper handling and correct use of different types of files.

- Types of drill bit and reamer. Calculation of cutting speed for the above operations. Type's proper coolant. Safety consideration for each operation.
- Types of tools used to make thread Calculation of tap drill size and die blank size. Types of the proper coolant. Safety consideration in tapping and dieing operations.

Unit -4

- Knowledge of limits, fits, tolerance. Systematic steps of different operation Safety consideration in each operation

CFF 102: TURNING WORKS

Total Credit : 3

Block 1

Unit 1

- State the safety precaution specific to turning on the lathe.
- Explain the principles workshop layout.

Unit 2

- State the purpose of turning.
- Describe the principle of the measuring instruments: its action, care and use for measurement setting up and assembly operations-
 - **Micrometer:** internal, external, depth.
 - **Vernier :** Caliper, depth, height.

Unit 3

- Identify types of lathe tools and their uses.

Unit 4

- Describe the geometry of the lathe tool including tool angles and its effect on turning for roughing and finishing operation

Block 2

Unit 1

- Type of cutting fluids & properties.

Unit 2

- Carry out Simple machining calculation
- Calculation of speed, feed & depth of cut using chart.

Unit 3

- Describe the basic method of Work holding devices – three jaw chuck, four jaw chuck, face plate, collect chuck etc.

Unit 4

- Describe the basic methods of supporting work – fixed steady, traveling steady.

Block 3

Unit 1

- Introduction to Lathe, description, types of Lathe – constructional features and functions.
- Specification of a Center Lathe.

Unit 2

- Lathe operations- turn, drill, face, chamfer, and part off knurl, threading, taper and form turn.

Unit 3

- Describe the different types of drills and taps used.
- Classification of steels, alloy steels and effect of alloying elements.

Unit 4

- Identify the turning fault & remedies.

CFF103: MILLING WORKS

Total Credit : 3

Block 1

Unit 1

- State the safety precaution specific to milling operations.
- Explain the principles workshop layout, blue print reading.

Unit 2

- Describe the principle of the measuring instruments: its action, care and use for measurement setting up and assembly operations-
 - Micrometer: internal, external, depth.
 - Vernier : Caliper, depth, height.

Unit 3

- State the purpose of Milling.

Unit 4

- Classification & properties of tool materials & selection criteria . ISO specification on carbide tools.

Block 2

Unit 1

- Basic knowledge of different tool materials (including their temperature ranges) in use.

Unit 2

Milling machine – Types, constructional features, Specifications - Merits and demerits

Unit 3

- Describe Work holding methods and work holding devices for milling operations.

Unit 4

- Type of dividing head and indexing method
- Nomenclature of milling cutters.

Block 3

Unit 1

- Classification of different types of milling cutters and their uses.
- Processes of milling – up milling, down milling, face milling and end milling.

Unit 2

- Describe horizontal milling operations-milling of flat surfaces, Gang and straddle milling, production of narrow slots, slotting and slitting of thin plates, key way cutting etc.

Unit 3

- Describe vertical milling operations- milling of sunk and recessed surfaces, woodruff cutters, use of shell end mills, face mills, face slot cutters, dovetail cutters etc.

Unit 4

- Cutting fluid, properties & applications.
- Selection of speed feed and depth of cut.
- Identify Milling fault & correction.

CFF104 : PIPE FABRICATION

Total Credit :3

Block 1

Unit 1

- Instruction to safety for piping

Unit 2

- Measurements for pipe fabrication work

Unit 3

- Common tools for pipe fabrication

Unit 4

- Important fittings of piping

Block 2

Unit 1

- Pipe size and schedule
- Pipe materials
- Piping joints

Unit 2

- Fabrication theory of pipe fittings

Unit 3

- Drafting symbols of piping
- Isometric drawing of piping

Unit 4

- Introduction of hydro test

CFF 105 : WORKSHOP CALCULATION & SCIENCE

Total Credit : 3

Block 1

Unit 1

Units- Introduction--Definition--classification of units—inter relationship between Metric and British System of units.

Unit 2

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

Unit 3

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

Unit 4

Ratio & Proportionate- Introduction--ratio—proportion.

Block 2

Unit 1

Percentage - Introduction--percentage method

Unit 2

Algebra - Introduction-careful consideration of subject items--addition and subtraction--multiplication and division--algebraic formula-factorization--equations

Unit 3

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

Unit 4

Trigonometry - definition--formula--measurement of angles.

Block 3

Unit 1

Electricity- Introduction--uses of electricity--molecule--atom--atomic structure- - electric current-AC. -DC.--ampere--EMF.--resistance--conductor--insulator--circuit

Unit 2

Electrical Power & Energy- Electric power--electric energy--

Unit 3

Effect of Electrical Current : Introduction---resistance --specific resistance— heating effect of electric current.

Unit 4

Electrical Machine - Introduction---DC. Generator--DC. Motor ratio of transformer

CFF 106 : PRACTICAL

Total Credit : 3

Block 1

Unit 1

- Use of protective clothing and boots
- Identify tools, equipment and material used in fitting

Unit 2

- Apply good housekeeping practices, proper handling of materials at work in safe manner
- Store/lay materials at work in safe manner

Unit 3

- Select proper tools for a particular task
- Read and interpret simple blue prints and drawing

Unit 4

- Practice of drilling machine.

Block 2

Unit 1

- Demonstrate the use of safety and work holding devices on metal cutting machines.
- Use and store of materials in a safe manner.
- Preparation of process planning sheet

Unit 2

- Practice on faceplate balancing
- Re-sharpen of plain turning tool on pedestal grinder and inspection
- Practical on work alignment, facing, turning, drilling chamfering, and parting off.
- Practical on Taper turning by compound slide method.

Unit 3

- Cut and chase screw threads.
- Practical on Knurling.

Unit 4

- Check measurements of components/machined parts, using micrometer and verniers
- Check roundness of component using the dial test indicator and vee blocks.
- Identifying different types of cutter used in Horizontal and Vertical milling machine

Block 3

Unit 1

- Practical on plan milling, slab milling.
- Use of tool holding devices
- Practices on dividing head
- Measure the job size with vernier caliper.

Unit 2

- Checking the flatness with tri-square
- Checking the squareness with tri-square
- Milling six faces of a cubical block to an accuracy of $\pm 0.1\text{mm}$.

Unit 3

- Practical of pipe fitting & joint
- Symbols of piping

Unit 4

- Practical of AC and DC electrical