# MF5203 TOOLING FOR MANUFACTURING

## DETAILED SYLLABUS

### UNIT I INTRODUCTION

Manufacturing Processes-objectives of manufacturing processes-classification of manufacturing process- Objectives of Tool design-tool design process- Nature and scope of Tool engineering principles of economy for tooling-problems of economy in tooling-planning and tooling for economy Manufacturing principles applicable to process and tool planning-tool control-tool maintenance-tool materials and its selection.

### UNIT II TOOLING FOR METAL REMOVAL PROCESSES

Traditional machining processes -work and tool holding devices-tool nomenclatures-Mechanism of machining-force temperature and tool life of single point tool-multipoint tools -tool design-tool wear special processes-capstan and turret lathe-tooling layout of automats-tooling in NC and CNC machines-tooling for machining centres-CAD in tool design- Jigs and fixtures-design-Non-traditional material removal processes-mechanical, electrical thermal and chemical energy processes-principles operation-equipment-tooling parameters and limitations.

### UNIT III TOOLING FOR METAL FORMING PROCESSES

Classification of Forming processes- Types of presses-design of -blanking and piercing dies-simple, compound, combination and progressive dies- Drawing dies - Bending dies-forging dies-plastic moulding dies.

### UNIT IV TOOLING FOR METAL CASTING AND METAL JOINING PROCESSES

Tools and Equipment for moulding-patterns– pattern allowances – pattern construction-die casting tools- mechanization of foundries. Tooling for Physical joining processes Design of welding fixtures –Arc welding, Gas welding, Resistance welding, laser welding fixtures- Tooling for Soldering and Brazing Tooling for Mechanical joining processes.

## UNIT V TOOLING FOR INSPECTION AND GAUGING

Survey of linear and angular measurements-standards of measurement-design and manufacturing of gauges- measurement of form- Inspection bench centre-co-ordinate measuring machine-tooling in CMM.

## REFERENCES

1. Cyril Donaldson Tool Design, Tata McGraw Hill, 1976.

2. Hoffman E.G Fundamentals of tool design SME 1984.

3. Kalpak Jian S., Manufacturing Engineering and Technology Addison Wesley 1995.

4. L E Doyle Tool Engineering Prentice Hall 1950.

5. Wellar,J Non-Traditional Machining Processes, SME, 1984.

## OBJECTIVES

- To study the various design considerations for tooling.
- Develop knowledge in tooling and work holding devices.