MF5104 METAL CUTTING THEORY AND PRACTICE

DETAILED SYLLABUS

UNIT I INTRODUCTION

Need for rational approach to the problem of cutting materials-observation made in the cutting of metals-basic mechanism of chip formation-thin and thick zone modes-types of chips-chip breaker orthogonal Vs oblique cutting-force velocity relationship for shear plane angle in orthogonal cutting energy consideration in machining-review of Merchant, Lee and Shafter theories-critical comparison.

UNIT II SYSTEM OF TOOL NOMENCLATURE

Nomenclature of single point cutting tool- System of tool nomenclature and conversion of rake angles nomenclature of multipoint tools like drills, milling-conventional Vs climb milling, mean cross sectional area of chip in milling-specific cutting pressure.

UNIT III THERMAL ASPECTS OF MACHINING

Heat distribution in machining-effects of various parameters on temperature-methods of temperature measurement in machining-hot machining-cutting fluids.

UNIT IV TOOL MATERIALS, TOOL LIFE AND TOOL WEAR

Essential requirements of tool materials-development in tool materials-ISO specification for inserts and tool holders-tool life-conventional and accelerated tool life tests-concept of mach inability index economics of machining.

UNIT V WEAR MECHANISMS AND CHATTER IN MACHINING

Processing and Machining – Measuring Techniques – Reasons for failure of cutting tools and forms of wear-mechanisms of wear-chatter in machining-factors effecting chatter in machining-types of chatter mechanism of chatter.

REFERENCES

1. Bhattacharya .A., Metal Cutting Theory and practice, Central Book Publishers, India, 1984.

2. Boothroid D.G. & Knight W.A., Fundamentals of machining and machine tools, Marcel Dekker, Newyork, 1989.

3. Shaw.M.C.Metal cutting principles, oxford Clare don press, 1984.

OBJECTIVES

To make the students familiar with the various principles of metal cutting, cutting tool materials and its wear mechanisms during the machining operation.