TOOLING FOR PRODUCTION

Course Code: 15ME2105

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Course Outcomes: At the end of the course, the student will be able to

CO1: Describe tool design methods and punch and die manufacturing techniques

CO2: Select material for cutting tools and gages; classify various cutting tools and gages and identify their nomenclature

CO3: Describe the principles of clamping, drill jigs and computer aided jig design

CO4: Design fixtures for milling, boring, lathe, grinding, welding; identify fixtures and cutting tools for NC machine tools

CO5: Explain the principles of dies and moulds design

UNIT-I (10-Lectures)

Tool design methods: Introduction, design procedure, statement of the problem, needs analysis – tentative design solutions, finished design, drafting and design techniques in tooling drawings, punch and die manufacturing techniques

UNIT- II (10-Lectures)

Tooling materials: Introduction, properties of tool materials, metal cutting tools, single point cutting tools, milling cutters, drills and drilling, reamer classification, taps, tap classification, the selection of carbide cutting tools, various heat treatments

Gauges and gauge design**:** Fixed gauges, gauge tolerances, the selection of material for gauges

UNIT- III (10-Lectures)

Design of jigs: Principles of clamping, drill jigs, chip formation in drilling, general considerations in the design of drill jigs, drill jigs and

modern manufacturing, computer aided jig design

UNIT- IV (10-Lectures)

Design of fixtures: Types of fixtures, vice fixtures, milling fixtures, boring fixtures, broaching fixtures, lathe fixtures, grinding fixtures, computer aided fixture design, welding fixtures, fixture design for NC machine tools, cutting tools for numerical control, tool holding methods for numerical control

UNIT- V (10-Lectures)

Design of dies and moulds: Die-design fundamentals, blanking and piercing die construction, pilots, strippers and pressure pads, presswork materials, bending dies, forming dies, drawing operations

Mould design: Splits in mould, split locking, two-cavity and multi-cavity moulds, design details of injection moulds

TEXT BOOK:

1. Donaldson Cyrll, George H.LeCain and Goold V.C., "*Tool Design*", TMH, 36th Reprint, 2006

REFERENCES:

1. Wilson F.W., "*Fundamentals of Tool Design*", ASTME, Prentice Hall, India, 2010
2. G.C. Sen and A. Bhattacharya, "*Principles of Machine Tools*", New Central Book Agency, Kolkata, 2009