DR. BABASAHEB AMBEDKAR MARATHWADA UNIVERSITY

CIRCULAR NO.SU/Engg./T.E. Mech./Syllabus/63/2015

It is hereby inform to all concerned that, on the recommendation of the Faculty of Engineering & Technology, the Hon'ble Vice-Chancellor has accepted the ***"Minor changes in the Subject of Tool Engineering, T.E. Mechanical Part Second"*** on behalf of the Academic Council Under Section-14[7] of the Maharashtra Universities Act, 1994.

This is effective from the Academic Year 2015-16 & onwards as appended herewith.

All concerned are requested to note the contents of the circular and bring notice to the students, teachers and staff for their information and necessary action.

University Campus,
Aurangabad-431 004.
REF.NO.SU/ENGG./T.E.[MECH.]/
2015/12324-53
Date:- 15-09-2015.

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Director,
Board of College and
University Development.

Copy forwarded with compliments to:-

1] The Principals, affiliated concerned colleges,
Dr. Babasaheb Ambedkar Marathwada University

Copy to :-

1] The Controller of Examinations,
2] The In-Charge, E-Suvidha Kendra, [Professional Unit] Rajarshi Shahu Maharaj Pariksha Bhavan, Dr. Babasaheb Ambedkar Marathwada University,
3] The Section Officer, [Engineering Unit],
4] The Programmer [Computer Unit-1] Examinations,
5] The Programmer [Computer Unit-2] Examinations,
6] The Record Keeper.

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S*/-280915/-

DR. BABASAHEB AMBEDKAR MARATHWADA UNIVERSITY, AURANGABAD.

Revised Subject of Tool Engineering of

T.E.
Mechanical
Part Second

UNDER THE FACULTY OF ENGINEERING & TECHNOLOGY.

[Effective from 2015-16 & onwards]

L/3

MED354TOOL ENGINEERING

Teaching Scheme
Theory – 4 Hrs/week.

Examination Scheme
Theory -- 80 Marks (4 hrs)
Class Test: 20 Marks

Objectives:-

- Enhancing imagination, visualization, design and interpretation skills of tool and tooling.
- To understand the standard practice followed in industries for tool design.
- To understand the functioning of tools for tool manufacturing.

Unit 1

Theory of metal Cutting

Introduction, Mechanics of Machining - Geometry of single point cutting tool, Single point cutting tool Designation of cutting tools, ORS and ASA system,Importance of Tool angles, Mechanism of chip formation, Orthogonal and oblique cutting .Machining forces and Merchant's Circle Diagram, Cutting fluid, Wear of cutting tool and tool Life ,Cutting tools materials. **08**

Unit 2

Design of jigs & fixture

Introduction, process planning, need of fixtures, locating & clamping - principle of location, locating elements principle for clamping purposes, clamping devices, design principles common to jigs & fixtures. Drilling Jigs :- Design principles, drill bushes, design principles for drill bushings, Types of drilling jigs - Template jig, plate type jig, swinging leaf jig, Box type jig, channel type jig Milling Fixtures: - Essential features of a milling fixtures, Design principles for milling fixtures, Indexing jig & fixtures, Turning fixtures, Automatic clamping devices **12**

Unit 3

Design of cutting tools

Introduction, types, geometry, Nomenclature and design of Drills , Milling ,Reamers, Taps & Broaches **05**

Unit 4

Press tool Design

Introduction of Press operations, Press working equipment - Classification, Rating of a press, Press tool equipments, arrangement of guide posts. Press selection, press working terminology, Types of dies - Simple dies, inverted die, compound dies, combination dies, progressive dies, Transfer dies, multiple dies. Principle of metal cutting, strip layout, Centre of Pressure, clearance, angular clearance, cutting forces, method of reducing cutting forces, Die block, Die block thickness, Die opening, Fastening of die block, back up plate, Punch, Methods of holding punches, Strippers, Stoppers, Stock stop, Stock guide, Knock outs, Pilots. Design of Blanking & Piercing die design - compound & progressive dies. **10**

Unit 5

Bending Forming & Drawing dies

Bending - Bending Terminology, V- Bending, Air bending, bottoming dies Wiping dies, spring back & its prevention, channel dies. Design Principles - Bend radius, Bend allowance, width of die opening, bending pressure. Drawing Dies – Introduction Metal flow during drawing, Design consideration - Radius of draw die, Punch radius, Draw clearance, Drawing speed, Calculating blank size, Number of draws Drawing pressure, Blank holding pressure. Introduction to Forging Dies.. **05**

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Pattern of Question Paper
Unit of syllabus are divided into two section .A Section consists-Unit 1 and 2. B - Section consists-Unit 3,4 and 5.
Question paper should cover entire syllabus.

RECOMMENDED BOOKS:

1. Donladson, Lecain and Goold, "Tool design", Tata McGrawhill.
2. M.H.A. Kempster, "Introduction to Jigs and fixtures design".
3. P .H. Joshi, "Jigs & Fixtures".
4. Wilson, "Fundamentals of tool design", A.S.T.M.E.
5. P C Sharma, "A Textbook Of Production Engineering". S. Chand publishers.
6. A. B. Chattopadhyay, "MACHINING AND MACHINE TOOLS"

REFERENCE BOOKS:

1. Fundamentals of Metal Machining By Geoffery Boothroyd
2. Hoffman, "Introduction to Jigs and fixtures".
3. Dolyle, "Manufacturing processes and material for engineers".
4. G. Kuppuswamy, "Principles of metal cutting", university press.
5. Richard Kibbe, John E.Neely, Meyer, White, "Machine tool practices".
6. Production Technology-HMT –Tata McGraw-Hill Publishing Ltd.
7. Metal Cutting Theory & Cutting Tool Desing By V. Arshinov, g. Alekseev
8. Techniques of Press Working Sheet Metal by Earry Reed.

3/3

MED374 Lab-X Tool Engineering

Teaching Scheme
Practical:- 2Hrs/Week
Practical/Oral Exam.- 25.

Examination Scheme
Term Work :-25 Marks

1. Prepare Single Point Cutting Tool from Soft material.
2. Demonstration of formation of various types of Chips
3. Handling and study of multipoint cutting tool.
4. Detail Drawing of different locating elements.
5. Detail Drawing of different Clamping elements.
6. Sheet on Multipoint Cutting Tools.
7. Design and Drawing of Jigs for giving components.
8. Design and Drawing of Fixtures for giving components.
9. Design and Draw a Press tool for giving components
10. Industrial Visit Report for study of Jigs & Fixtures/Press Tools