16AE207 MANUFACTURING PROCESS FOR AUTOMOTIVE COMPONENTS

Hours Per Week :

L	T	P	C
3	-	2	4

Total Hours :

L	T	P
45	-	30

WA/RA	SSH/HSH	CS	SA	S	BS
2	40	2	5	2	2

Course Description and Objectives:

Course describes the basic theory of metal working and metal cutting principles such as foundry, welding, metal forming and metal cutting. It also includes CNC machine tools and surface finishing process. Objective of the course is to provide the basic knowledge of different manufacturing process in automobile industry.

Course Outcomes:

The student will be able to:

- follow the concept of foundry useful for automobile manufacturing components.
- understand the concept of welding and its types.
- know the metal cutting process for automobile component manufacture.
- understand the concept of metal forming.
- know the process involved in manufacturing surface coating and plastics.

SKILLS:

- ü *Handle casting process*
- ü *Perform forging and ,welding operations*
- ü *Operate different machine tools*
- ü *Program CNC machine*

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UNIT-1 **L-9, P-5**

CASTING : Casting terminology, Moulding sand, Types of patterns, Pattern materials, Pattern allowances, Cores – Elements of gating system. Investment casting, Die casting, Centrifugal casting, Casting defects.

UNIT-2 **L-10, P-5**

FORGING : Types of forging, Drop forging, Press and machine forging, Forging defects .

SHEET MATERIAL OPERATIONS : Shearing, Blanking, Piercing, Spinning, Drawing, Bending.

WELDING : Gas welding, Arc welding, TIG, MIG, Soldering and brazing.

UNIT-3 **L-9,P-5**

METAL CUTTING : Elements of metal casting, Chip formation, Types of chips, Tool geometry speed, Feed, Depth of cut.

LATHE : Working principle of lathe, Principle parts of lathe work holders, Turning operations.

SHAPER : Working principle, Principle part of shaper, Shaping operations.

UNIT-4 **L-9,P-5**

MILLING Principle of working, Column and knee type milling machine, Milling operations and cutters, Indexing Methods.

GRINDING : Theory of grinding, Cylindrical and surface grinding, Lapping and Honing.

UNIT-5 **L-8,P-5**

NUMERICAL CONTROL :NC elements, Structure of CNC Machine tools, CNC part programming, Manual part programming , Computer Aided part programming, DNC machine tools.

LIST OF EXPERIMENTS: Total hours: 30

List of experiments - Lathe:

1. Facing and chamfering
2. Step turning.
3. Drilling and taper turning.
4. Grooving, and knurling.
5. Thread cutting – External and internal.

List of experiments – special machines:

6. Internal and external dovetail machining in shaper.
7. Spur gear Milling.
8. Keyway slotting.
9. Pocket Milling.
10. Grinding.

TEXT BOOKS:

1. P.C. Sarma, “Production Technology”, 3rd Edition, S. Chand Publications , 2009.
2. M.P. Groover, “Automation, Production Systems and Computer Integrated Manufacturing”, 3rd Edition, PHI Publications, 2008.

REFERENCE BOOKS:

1. H.N. Gupta, R.C. Gupta and Arun Mittal, “Manufacturing Processes”, 2nd editon, New Age International, 2009.
2. AmitabaGhosh and A. Kumar Mallik, “Manufacturing Science”, 1st Edition, East West Publishers, 2009.
3. Kalpakjian, “Manufacturing Engineering and Technology”, 4th Edition., Pearson Education, 2005.

ACTIVITIES:

- *Facing and chamfering*
- *Step turning.*
- *Drilling and taper turning.*
- *Grooving, and knurling.*
- *Thread cutting – External and internal.*
- *Milling of spur gear.*
- *Keyway slotting.*