GANPAT UNIVERSITY

FACULTY OF ENGINEERING & TECHNOLOGY

Programme	Diploma Engineering		Branch	Automobile	
Semester	IV		Version	1.0.0.0	
Effective from Academic Year	2019-20		Effective for the batch Admitted in		June 2018
Subject code	1AU2404	Subject Name	AUTOMOBILE MANUFACTURING TECHNOLOGY		

Teaching scheme						Examination scheme (Marks)			
(Per week)	Lecture(DT)		Practical(Lab.)		Total		CE	SEE	Total
	L	TU	P	TW					
Credit	3	0	1	0	4	Theory	40	60	100
Hours	3	0	2	0	5	Practical	30	20	50

Pre-requisites:

Student must have knowledge of workshop practices, work shop tools, manufacturing processes like metal working, metal joining, metal casting, engineering drawing and production drawing. Students also have knowledge of limits, fits and tolerance.

Course Learning Outcomes:

The course content should be taught and implemented with an aim to develop different skills leading to the achievement of the following competencies and course learning outcomes:

After completions of this course, students will able to:

1. Describe various manufacturing processes and its application.
2. Describe principles of metal working processes, metal joining processes, metal casting and its application.
3. Identify defects and its causes in metal working processes, Casting process and welding processes.
4. Developing the skill of manufacturing. Ability to convert the engineering drawing in to production drawing.
5. Explain working principle of conventional and non-conventional Machine Tool and operations carried out on each Machine tool.

Make the job as per given manufacturing drawing. The practical should be carried out in such a manner that students are able to acquire different learning out comes in cognitive, psychomotor and affective domain to demonstrate course learning outcomes.

Course Content

Name of UNIT	Unit Content	Unit Learning Outcomes	Marks	Hrs
Unit – I Introduction To Manufacturing Processes	1.1 Nature, role and scope of manufacturing process. 1.2 Classification of manufacturing processes. 1.3 Introduction and application of each process. 1.4 Types of production.	1.a Describe various manufacturing processes & its application	6	4
Unit– II Metal Working Processes	2.1 Hot and cold working processes. 2.2 Working principles and application of: Rolling, Drawing, Spinning, Forging, Bending, Extrusion, Piercing. 2.3 Common Defects observed in cold and hot working processes. 2.4 Remedial measures.	2a. Describe principles & its application of metal working processes. 2b. Explain Defects and its remedies in metal working processes.	10	8

Unit– III Metal Casting	3.1 Introduction to casting. 3.2 Introduction Of Pattern and Pattern Allowances. 3.3 Working principles of different methods of casting. 3.4 Casting defects and remedial measure.	3a. Explain various casting process. 3b. Explain Casting defects & Remedial measures.	8	6
Unit– IV Metal Joining	4.1 Introduction and classification of Metal Joining methods. 4.2 Working principles, application, and limitation of Gas Welding, Arc Welding & Resistance Welding. 4.3 Defects in Welding. 4.4 Remedial Measures. 4.5 Working principles & application of Brazing and Soldering. 4.6Safety precautions.	4a. Describe different metal joining processes 4b.Identify appropriate metal joining process for the given job.	8	6
Unit– V Basic Machine Tools	5.1 Introduction to Basic Machine Tools. 5.2 Working principle of each Machine Tool & List out and explain each operation carried out on each Machine tool like, Shaping, Milling, Drilling, Lathe, Grinding etc… 5.3 Factors affecting the selection of suitable Machine tool.	5a. Explain Working principle of each Machine Tool & operations carried out on each Machine tool. 5b.Describe Factors affecting the selection of suitable Machine tool.	20	14
Unit– VI Modern Manufacturing Tools & Techniques.	6.1 Need and Role of Automation in manufacturing of automobile industry. 6.2 Basic concepts of NC, CNC, DNC and introduction of their components. 6.3 Basic concepts of Flexible Manufacturing System, Basic concepts of Group Technology 6.4, Benefits of FMS and GT. 6.5 Application of Automated Material handling tools like AGVs, and Robots.	6a. Justify need and role of automation in automobile manufacturing industries 6b. Explain basic concept of NC, CNC, DNC, FMS, and GT. 6c. Explain automated material handling tools.	8	7

List of Practical

No.	Unit	Name of Practical
1	**Unit– II**	Demonstrate forging process.
2	**Unit– III**	Demonstrate casting procedure.
3	**Unit– IV**	Prepare a job using gas cutting and gas welding.
4	**Unit– IV**	Prepare a job using arc welding.
5	**Unit– IV**	Demonstrate brazing and soldering and operation.
6	**Unit– V**	Demonstrate and Prepare a job on centre lathe as per the given drawing. (Including facing, plain turning, taper turning, knurling, threading, grooving, chamfering operation on lathe machine etc).

7	**Unit– V**	Demonstrate and Prepare a job having plain and inclined surfaces on shaping machine with minimum two holes as per given drawing.
8	**Unit– V**	Demonstrate and Prepare a job using milling operations including use of indexing head on milling machine as per given drawing.
9	**Unit– V**	Demonstrate surface finishing operations on Grinding machine.
10	**Unit– VI**	Demonstrate working of CNC Lathe machine.

List of Instruments / Equipment / Trainer Board	
1	Lathe Machine
2	Milling Machine
3	Grinding Machine
4	Drilling Machine
5	Shaping Machine
6	Casting Equipments
7	Single point Cutting tool and multi point cutting tool
8	Bench vice
9	Welding machine
10	Furnace
11	CNC lathe machine

List of Reference Books			
No	Title of Reference Books	Authors	Publication
1	Production Technology	R. K. Jain & S.C.Gupta	Khanna Publ.
2	Production Technology	O.P.Khanna	Dhanpat Rai and Sons
3	Workshop Technology Vol-I, Vol-II	Hazra Choudhary	Media promotors and publishers pvt. Limited,
4	Workshop Technology Vol-I, Vol-II	Raghuwanshi	Dhanpat Rai and Sons
5	A Textbook Of Workshop Technology : Manufacturing Processes	R.S. Khurmi And J.K. Gupta	S. Chand Limited
6	Automation, Production Systems, and Computer-integrated Manufacturing	Automation, Production Systems, and Computer-integrated Manufacturing	Prentice Hall

Link of Learning Web Resource	
1	http://www.youtube.com/watch?v=Kmb5tivQ_bY
2	http://www.youtube.com/watch?v=Kmb5tivQ_bY
3	http://www.youtube.com/watch?v=h-c4_Ukqgx4
4	http://www.youtube.com/watch?v=OOyAaWT6WQU
5	http://www-old.me.gatech.edu/jonathan.colton/me4210/casting.pdf
6	http://me.emu.edu.tr/majid/MENG364/2_casting.pdf

CO'S AND PO'S MAPPING

PO'S/CO'S		CO1	CO2	CO3	CO4	CO5
PO1	An ability to apply knowledge of mathematics and engineering science.	**NONE**	**SLI**	**NONE**	**SLI**	**NONE**
PO2	An ability to demonstrate, develop and conduct experiments, as well as to analyze and interpret data.	**MED**	**SUB**	**MED**	**MED**	**SUB**
PO3	An ability to design a system component, or process to meet desired needs within realistic constraints such as economic, environmental, social, political, ethical, health and safety, manufacturability and sustainability.	**SLI**	**SLI**	**SLI**	**SLI**	**SLI**
PO4	An ability to perform with multidisciplinary teams.	**SLI**	**MED**	**SLI**	**SLI**	**SLI**
PO5	Use of appropriate modern tool and application software that pertain to Automobile engineering technology systems.	**MED**	**SUB**	**MED**	**MED**	**SUB**
PO6	An ability to identify, formulates, execute and solve engineering problems.	**SLI**	**SLI**	**MED**	**SLI**	**SLI**
PO7	An ability to communicate and present effectively in both verbal and written forms.	**SLI**	**MED**	**MED**	**MED**	**MED**
PO8	The broad education necessary to understand the impact of engineering solutions in global, economic, environmental and societal context.	**SLI**	**MED**	**MED**	**SLI**	**MED**
PO9	Recognition of need for self-improvement, and an ability to engage in life-long learning.	**MED**	**MED**	**SLI**	**SLI**	**MED**
PO10	Ability to aware about the contemporary issues.	**SLI**	**SLI**	**SLI**	**SLI**	**SLI**
PO11	An ability to use the techniques, skills, and modern engineering tools necessary for engineering practice.	**MED**	**MED**	**MED**	**SUB**	**SUB**
PO12	Demonstrate to analyse and apply unconventional processes, automation, robotics Nanotechnology, Computer-Aided-Design & Manufacturing and knowledge in Automobile Engineering, Thermodynamics, Refrigeration & Air Conditioning and Jet Propulsion & Rocket Engineering to analyse and solve complex problems and to work professionally in such systems and plants.	***MED***	**MED**	**SLI**	**SUB**	**SUB**