NARSIMHA REDDY ENGINEERING COLLEGE
UGC AUTONOMOUS INSTITUTION
Maisammaguda (V), Kompally - 500100, Secunderabad, Telangana State, India
UGC - Autonomous Institute
Accredited by NBA & NAAC with 'A' Grade
Approved by AICTE
Permanently affiliated to JNTUH

Year/Sem: III/I

Course Title: Metrology and machine Tools

Course: ME3103PC

Course Objectives: The course content Enables students to

1. Acquire the knowledge of engineering metrology and its practice which is having increasing importance in industry.
2. Specifically make the student to improve applications aspects in the measurements and control process of manufacture.
3. Impart the fundamental aspects the metal cutting principles and their applications in the studyingbehavior of various machining processes.
4. Train in knowing the fundamentals parts of various machine tools and their kinematic scheme.
5. Discuss various principles of jigs and fixtures which will be used to hold and guide the work piece and Cutting tools in various machine tools

Course Out Comes:

At the end of the course the student would be able to

1) CO1**:** Identify techniques to minimize the errors in measurement.

2) CO2: Identify methods and devices for measurement of length angle gear and thread parameters surface roughness and geometric features of parts.

3) CO3: Understand working of lathe, sharper, planer, drilling, milling and milling grinding machines.

4) CO4: Comprehend speed and feed mechanisms of machine tools.

5) CO5: Estimate machining times for machining operations on machine tools.

UNIT WISE QUESTION BANK

Unit-I

Part–A(Short Answer Questions)					
S No		**Question**	**BT**	**CO**	**PO**
1		Define lathe and types of operation?	L1	CO1	1,3,9
2		Discuss the variables affecting tool life?	L1	CO1	1,3,9
3		When are magnetic chucks used for lathe operations?	L1	CO1	1,3,9
4		Define taper. How is the amount of taper expressed?	L1	CO1	1,3,9
5		What is meant by eight tool layout of turret lathe?	L1	CO1	1,3,9
6		What do you mean by back back gear in lathe?	L2	CO1	1,3,9
7		Why lathe beds are made of cast iron? Explain.	L1	CO1	1,3,9
8		With neat figure explain the tool elements and tool angles for single point tool?	L1	CO1	1,3,9
9		What are advantages of lathe machine?	L2	CO1	1,3,9
10		What factors influence the life of a cutting?	L2	CO1	1,3,9
Part–B (Long Answer Questions)					
11	a)	Define cutting speed and depth of cut with respect to turning process also state units of measurement?	L2	CO1	1,3,9
	b)	Differentiated between capstan lathe and turret lathe?	L3	CO1	1,3,9
12		What is the working principle lathe machines and their applications?	L2	CO1	1,3,9
13	a)	What is the geometry single point tool and its advantages?	L2	CO1	1,3,9
	b)	Different of types of lathes and specification?	L2	CO1	1,3,9
14		What are the various types of automatic lathe? Explain their differences and applications ?	L3	CO1	1,3,9
15	a)	Explain about different of chips breakers with neat diagram?	L3	CO1	1,3,9

Unit-II

(Short Answer) Questions)				
S.No.	**Question**	**BT**	**CO**	**PO**
1	Define drilling machines?	L1	CO2	1,2
2	Different of types boring machine?	L1	CO2	1,2
3	State that differences single house planning machine?	L	CO2	1,2
4	Describe a tapping attachment in drilling machine?	L2	CO2	1,2
5	List out explain various drilling machine operations with neat sketch?	L2	CO2	1,2
6	What is a jig boring machine?	L2	CO2	1,2
7	Write the principle of working shaper with neat sketch?	L3	CO2	1,2
8	State that difference between honing and lapping?	L1	CO2	1,2
9	Write the principle of working slotting machine?	L1	CO2	1,2
10	List and explain various drilling operations with neat sketch?	L2	CO2	1,2
part–B (Long Answer Questions)				
11	Discuss problem faced in a drilling operation with their causes and possible?	L3	CO2	1,2
12	What are vertical boring machines? Where are they be preferred are why?	L3	CO2	1,2
13	Write the principle of working of sharper with neat sketch?	L3	CO2	1,2
14	State that difference between honing and lapping?	L3	CO2	**1,2**
15	Describe tapping attachments in drilling machine?	L3	**CO2**	1,2
16	What is jigs boring machine? Detail the construction and working detail?	L3	**CO2**	1,2

Unit-III

Part–A(Short Answer Questions)					
S.No.		**Question**	**BT**	**CO**	**PO**
1		Explain face milling with neat sketch?	L1	CO3	1,9
2		Explain saddle milling with neat sketch?	L1	CO3	1,9
3		Explain dove tail milling with neat sketch?	L2	CO3	1,9
4		Describe a milling cutter?	L2	CO3	1,9
5		.Explain form of milling with neat sketch?	L2	CO3	1,9
6		Define the grinding ratio?	L2	CO3	1,9
7		What are factor contribute to increased production rate broaching?	L3	CO3	1,9
8		Define the finish ability?	L1	CO3	1,9
9		Define the sensitivity?	L1	CO3	1,9
10		Define the grind ability?	L2	CO3	1,9
Part–B (Long Answer Questions)					
11		Explain the classification of grinding machines?	L3	CO3	1,9
12	a)	Explain the principle of milling machines?	L3	CO3	1,9
	b)	What is the application of milling machines?	L3	CO3	1,9
13	a)	Explain types of abrasive bonds selections of grinding wheel?	L3	CO3	1,9
14	a)	What are advantages of grinding?	L2	CO3	1,9
	b)	What is the geometry milling cutters method?	L3	CO3	1,9
15		Define lapping and Explain the working principle of lapping?	L3	CO3	1,9
16		Explain the honing and its advantages and disadvantages?	L3	CO3	1,9

Unit IV

Part–A(Short Answer Questions)

S.No.	Question	BT	CO	PO
1	Define limits and tolerance?	L1	CO4	2,3
2	Explain types of fits?	L1	CO4	2,3
3	Differentiate hole shaft basis system?			
4	Define Limit gauges?	L2	CO4	2,3
5	Explain the various standards of linear measurement?	L2	CO4	2,3
6	What are the applications optical flats?	L2	CO4	2,3
7	What meant by unilateral and bilateral?			
8	What is the instrument s used for flat surface measurement?	L1	CO4	2,3
9	Explain the measurement of flatness using straight angles?	L1	CO4	2,3
10	Define the sine bar and its applications?	L2	CO4	2,3

Part–B (Long Answer Questions)

11		Explain with help of a diagram the principle of working of a sine bar for angular measurement? List of the advantages and application.	L3	CO4	2,3
12		Define and explain about interchangeability and selectively?	L3	CO4	2,3
13		With a sketch explain the construction of auto collimator. What are its applications?	L3	CO4	2,3
14		Explain the briefly different types of fits with necessary sketch?	L2	CO4	2,3
15		Mention the materials used for the manufacturing of GO and NOGO gauges? Explain the deposition of tolerance on GO and NOGO gauges by taking references to work tolerances?	L3	CO4	2,3

Unit-V

Part–A(Short Answer Questions)				
S.No.	**Question**	**BT**	**CO**	**PO**
1	What is the Importance of Surface roughness?	L1	CO5	1,2
2	Define the terms roughness, waviness, lay, flaws and roughness width.	L1	CO5	1,2
3	What are the methods of measurements for Surface finish?	L2	CO5	1,2
4	What is the difference between surface roughness and surface waviness?	L2	CO5	1,2
5	Mention the geometrical characteristics of a surface?	L2	CO5	1,2
6	Define surface finish?	L2	CO5	1,2
7	What are the symbols for surface finish?	L3	CO5	1,2
8	Derive the expression for Best size of Wire'?	L1	CO5	1,2
9	Define position accuracy?	L1	CO5	1,2
10	Write the applications of features CMM?	L2	CO5	1,2

Part–B (Long Answer Questions)					
11		Write the difference between surface roughness and surface waviness?	L3	CO5	1,2
12	a)	Write its applications of surface roughness?	L3	CO5	1,2
	b)	Write the advantages and disadvantages of surface waviness?	L3	CO5	1,2
13		Comparison between RMS and CLA values	L3	CO5	1,2
14	a)	With the help of neat sketch explain about talyurf method for measuring surface finish?	L2	CO5	1,2
	b)	Write its advantages and application of surfaces finish	L3	CO5	1,2
15		What are the methods of measurement of surface finish and explain any one?	L3	CO5	1,2
16		What is the symbol for fully defining surface roughness? explain each them	L2	CO5	1,2