



# SWARNANDHRA COLLEGE OF ENGINEERING & TECHNOLOGY (AUTONOMOUS)

Accredited by National Board of Accreditation, AICTE, New Delhi, Accredited by NAAC with "A" Grade – 3.32 CGPA, Recognized under 2(f) & 12(B) of UGC Act 1956, Approved by AICTE, New Delhi, Permanent Affiliation to JNTUK, Kakinada Seethampuram, W.G.DT., Narsapur-534280, (Andhra Pradesh)

## DEPARTMENT OF MECHANICAL ENGINEERING

### TEACHING PLAN

Course Code	Course Title	Semester	Branches	Contact Periods /Week	Academic Year	Date of commencement of Semester
19ME5ET03	TOOL DESIGN	V	Mechanical Engineering	5	2021-2022	1-10-2021

#### COURSE OUTCOMES

1	Explain the design requirements of single point and multi-point cutting tools.[K2 ]
2	Describe the importance of cutting tools and work holding device in design.[K2]
3	Explain jigs, illustrate the function of jigs for several operations and simple design of jigs.[K2]
4.	Illustrate the design principles of fixtures and describe the application of fixtures for machine tools and NC Machine. [K3]
5	Explain the fundamentals of die cutting operations and design of simple progressive and sets. [K2]

UNIT	Out Comes / Bloom's Level	Topics No.	Topics/Activity	Text Book / Reference	Contact Hour	Delivery Method	
I	Explain the design requirements of single point and multi-point cutting tools.[K2 ]	<b>DESIGN OF CUTTING TOOLS</b>					Chalk & Talk, PPT videos
		1.1	design of cutting tools introduction	T1, T2, R1	1	Chalk & Talk, PPT videos	
		1.2	Metal cutting process,	T1, T2, R1	1		
		1.3	Selection of tool materials	T1, T2, R1	1		
		1.4	Design of single points	T1, T2, R1	1		
		1.5	Design of single point tool	T1, T2, R1	1		
		1.6	multipoint cutting tool	T1, T2, R1	1		
		1.7	form tools	T1, T2, R1	1		
		1.8	milling cutter	T1, T2, R1	1		
		1.9	Milling cutters	T1, T2, R1	1		
		1.10	Broaches and chip breaker.	T1, T2, R1	1		
		1.11	Chip breaker.	T1, T2, R1	1		
	Course Syllabus Beyond	1.12	Advanced Metal cutting process,	T1, T2, R1	1		
<b>Total</b>					<b>11</b>		
II	o - s e f	<b>LOCATING AND CLAMPING METHODS</b>					





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	Course Syllabus	Beyond	1.12	Advanced Metal cutting process,	T1, T2, R1	1	
<b>Total</b>						<b>11</b>	
<b>II</b>	Describe the importance of cutting tools and work holding device in design. [K2]	<b>LOCATING AND CLAMPING METHODS</b>					
		2.1	locating and clamping methods introduction	T1, T2, R2	1	Chalk & Talk, Activity PPT videos	
		2.2	Basic Principles of Location	T1, T2, R2	1		
		2.3	Locating methods	T1, T2, R2	1		
		2.4	Principles of clamping	T1, T2, R2	1		
		2.5	Mechanical actuation	T1, T2, R2	1		
		2.6	Pneumatic actuation	T1, T2, R2	1		
		2.7	Hydraulic actuation	T1, T2, R2	1		
		2.8	Clamping force	T1, T2, R2	1	Chalk & Talk, PPT videos	
		2.9	Clamping force analysis	T1, T2, R2	1		
2.10	Design problems	T1, T2, R2	1				
	Course Beyond Syllabus		2.11	Design of Location methods	T1, T2, R2	1	
<b>Total</b>						<b>11</b>	
<b>III</b>	Explain jigs, illustrate the function of jigs for several operations and simple design of jigs. [K2]	<b>DESIGN OF JIGS</b>					
		3.1	design of jigs introduction	T1, T2, R1	1	Chalk & Talk, PPT videos	
		3.2	drill jigs	T1, T2, R1	1		
		3.3	Types of drill jigs	T1, T2, R1	1		
		3.4	General considerations in the designs	T1, T2, R1	1		
		3.5	drill jigs	T1, T2, R1	1	Chalk & Talk, PPT videos	
		3.6	Drill bushings	T1, T2, R1	1		
		3.7	Types of Drill bushings	T1, T2, R1	1		
		3.8	Design of Boxes,	T1, T2, R1	1		
		3.9	designs of Plate	T1, T2, R1	1		
		3.10	Design of Channel	T1, T2, R1	1		
3.11	Design of Angle plate	T1, T2, R1	1				
	Course Beyond Syllabus		3.12	Design analysis of jigs	T1, T2, R2	1	
<b>Total</b>						<b>12</b>	
<b>IV</b>	Illustrate the design principles of fixtures and describe the application of fixtures for machine tools and NC Machine. [K3]	<b>DESIGN OF FIXTURES</b>					
		4.1	Introductions of fixtures	T1, T2, R1	1	Chalk & Talk, PPT videos	
		4.2	Types of fixtures,	T1, T2, R1	1		
		4.3	General considerations in the designs	T1, T2, R1	1		
		4.4	Fixtures for lathe	T1, T2, R1	1		
		4.5	Fixtures for milling	T1, T2, R1	1	Chalk & Talk, PPT	
		4.6	Fixtures for boring	T1, T2, R1	1		
4.7	Fixtures for broaching	T1, T2, R1	1				





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		4.8	General considerations in fixtures	T1, T2, R1	1	Chalk & Talk PPT Videos Chalk & Talk
		4.9	Fixture design for NC Machine.	T1, T2, R1	1	
		4.10	Fixture design for NC Machine.	T1, T2, R1	1	
		4.11	Applications of NC machines	T1, T2, R1	1	
		4.12	Working of of NC machines	T1, T2, R1	1	
		4.13	Features of NC machines	T1, T2, R1	1	
		4.14	Direct Numerical controls	T1, T2, R2	1	
Course Beyond Syllabus		<b>Total</b>			<b>14</b>	
<b>DESIGN OF DIES</b>						
<b>V</b>	. Explain the fundamentals of die cutting operations and design of simple progressive and sets. [K2]	5.1	Introduction of dies	T1, T2, R2	1	Chalk & Talk, PPT videos
		5.2	Fundamentals of die cutting operations	T1, T2, R2	1	
		5.3	Cutting action in punch	T1, T2, R2	1	
		5.4	Cutting action in die	T1, T2, R1	1	
		5.6	die operations	T1, T2, R1	1	
		5.7	Die clearance	T1, T2, R1	1	
		5.8	Die applications	T1, T2, R1	1	
		5.9	General considerations in the designs	T1, T2, R1	1	
		5.10	Design of simple die	T1, T2, R2	1	
		5.11	Design of progressive die	T1, T2, R2	1	
		5.12	Design of simple die	T1, T2, R1	1	
		5.13	Design and analysis of dies	T1, T2, R1	1	
		Course Beyond Syllabus		5.14	Features of die casting	T1, T2, R2
<b>Total</b>					<b>14</b>	
<b>CUMULATIVE PROPOSED PERIODS</b>					<b>Total</b>	<b>62</b>

### Text Books:

S.No.	
T1	R.K. Jain and S.C. Gupta, Production Technology, Khanna Publishers, Edition 16 <sup>th</sup> , 2007
T2	Cyril Donaldson, Tool design, 5 <sup>th</sup> Edition, McGraw hill Publications, 2017
T3	S Kalpak Jian S R. Schmidt, Manufacturing- Engineering and Technology, Pearson publications, 7 <sup>th</sup> Edition, 2014

### Reference Books:

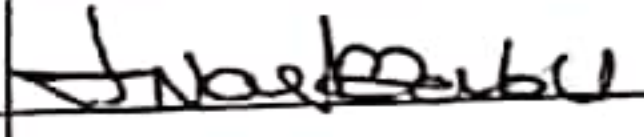
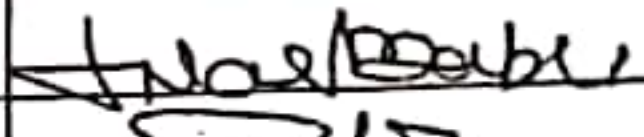
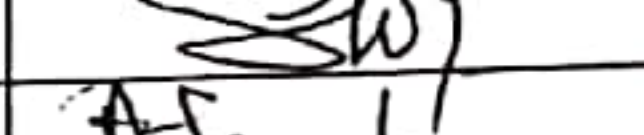
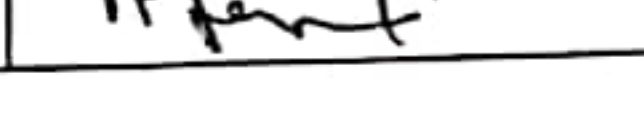




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S.No.	
R1	Manufacturing Technology Vol-II/P.N.Rao/Tata McGraw Hill 2013
R2	R.K. Jain and S.C. Gupta, Production Technology, Khanna Publishers, Edition 16 <sup>th</sup> 2017
R3	Elanchezhian & M. Vijayan Machine Tools, Anuradha Publications Editions 1 <sup>st</sup> 2008
Web Details	
1	<a href="https://nptel.ac.in/courses/112106179/">https://nptel.ac.in/courses/112106179/</a>
2	<a href="https://youtu.be/ljveGnQw2G0">https://youtu.be/ljveGnQw2G0</a>
3	<a href="https://nptel.ac.in/courses/1123106178/">https://nptel.ac.in/courses/1123106178/</a>

	Name	Signature with Date
i. Faculty	J.NARESH BABU	
ii. Course Coordinator	J.NARESH BABU	
iii. Module Coordinator	Dr. SANJEEV KUMAR	
iv. Programme Coordinator	Dr. A. GOPI CHAND	

  
Principal