SHAMBHUNATH INSTITUTE OF ENGINEERING & TECHNOLOGY

MANUFACTURING SCIENCE & TECHNOLOGY-II (NME-503)

SESSION- 2017-18, (5th SEMESTER)

By: Abhilash Gupta

Lecture Number	Unit Number	Topics to be covered	Status remark
01	I	Introduction	
02	I	Mechanics of metal cutting	
03	I	Geometry of tool and nomenclature	
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05	I	ASA system	
06	I	Orthogonal vs. Oblique cutting.	
07	I	Mechanics of chip formation	
08	I	Types of chips.	
09	I	Shear angle relationship	
10	I	Cutting forces	
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12	I	Merchant's force circle diagram	
13	I	Power required.	
14	I	Numerical	
15	I	Heat generation and cutting tool temperature,	
16	I	Cutting fluids/lubricants	
17	I	Tool materials.	
18	I	Tool wear	
19	I	Tool life & Machinability.	
20	I	Brief introduction to machine tool vibration and surface finish	
21	I	Economics of metal cutting.	
22	II	Lathe: Principle, construction, types, Operations	
23	II	Turret/capstan, Semi/Automatic	
24	II	Tool layout	
25	II	Shaper: Construction, operations & drives.	
26	II	Slotter: Construction, operations & drives.	
27	II	Planer: Construction, operations & drives.	
28	II	Milling: Construction, Milling cutters, up & down milling.	
29	II	Dividing head & indexing.	
30	II	Max chip thickness & power required.	

31	**II**	Drilling and boring	
32	**II**	Reaming tools.	
33	**II**	Geometry of twist drills.	
34	**III**	Grinding: Grinding wheels, abrasive & bonds	
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36	**III**	Cutting action. Grinding wheel specification. Grinding wheel wear - attritions wear, fracture wear, Dressing and Truing	
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38	**III**	Max chip thickness and Guest criteria.	
39	**III**	Surface and cylindrical grinding. Centerless grinding	
40	**III**	Super finishing: Honing, lapping and polishing.	
41	**III**	Introduction to Limits, Fits, Tolerances and IS standards	
42	**III**	Limit-gauges	
43	**III**	Surface-Roughness.	
44	**IV**	**Metal Joining:** Survey of welding and allied processes. Gas welding and cutting, process and equipment	
45	**IV**	Arc welding: Power sources and consumables. TIG & MIG processes and their parameters	
46	**IV**	Resistance welding - Spot, Seam & Projection	
47	**IV**	Other welding processes such as Atomic Hydrogen, Submerged arc, Electro slag,	
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49	**IV**	Friction welding.	
50	**IV**	Soldering & Brazing. Adhesive bonding.	
51	**IV**	Thermodynamic and Metallurgical aspects in welding and weld, Weldability	
52	**IV**	Shrinkage/Residual stress in welds. Distortions & Defects in welds and remedies.	
53	**IV**	Weld decay in HAZ.	
54	**V**	**Introduction to Unconventional Machining and Welding:** Need & benefits, application and working principle of EDM, ECM	
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56	**V**	LBM, EBM	
57	**V**	USM. AJM, WJM.	
58	**V**	Similarly, non-conventional welding applications such as LBW, USW	
59	**V**	EBW, Plasma-arc welding,	
60	**V**	Diffusion welding, Explosive welding/cladding.	
61	**V**	Introduction to Hybrid machining processes	