LESSON PLAN

DISCIPLINE: MECHANICAL ENGINEERING **SEMESTER:** V

SUBJECT: CNC MACHINES AND AUTOMATION

LESSON PLAN DURATION: 15 WEEKS

WORK LOAD (LECTURE/PRACTICAL) PER WEEK: (3 lectures, 2 Practical)

WEEK	THEORY		PRACTICALS
	LECTURE NOS	TOPIC	TOPIC
1st	1	**Unit-1-** Introduction, Introduction to NC, CNC & DNC,	Practical-1 Study of constructional detail of CNC lathe.
	2	Advantages, disadvantages and its Applications.	
	3	Basic components of CNC machines, Machine Control Unit,	
2nd	4	Input devices, selection of components to be machined on CNC machines,	Practical-2 Study of constructional detail of CNC milling machine.
	5	Axis identification	
	6	**Unit-2-** Construction and Tooling	
3rd	7	Design features, specification of CNC machines,	Practical-3 Study the constructional details and working of Automatic tool changer and Multiple pallets
	8	use of slide ways, balls, rollers	
	9	coatings, motor and lead screw, swarf removal,	
4th	10	safety and guarding devices, various cutting tools for CNC machines,	Practical-4 Develop a part programme for following lathe operations and make the job on CNC lathe. - Plain turning and facing operation - Taper turning operation - Circular interpolation.
	11	Concept of CNC tool holder, different pallet systems	
	12	Automatic tool changer system, management of a tool room.	
5th	13	**SESSIONAL TEST –I**	Repeat Practical 1 to 4
	14	**Unit-3-** System Devices- Control System; Open Loop and Closed Loop System,	
	15	Concept of Actuators, Transducers and Sensors, Tachometer, LVDT,	
6th	16	Interrupters, potentiometers for linear and angular position	Repeat Practical 1 to 4
	17	Encoder and decoder and axis drives	
	18	**Unit-4-**Part Programming, Introduction to Part programming, Basic concepts of part programming,	
7th	19	NC words, part	Repeat Practical 1 to 4

		programming formats, simple programming for rational components, part programming using conned cycles,	
	20	subroutines and do loops, tool off sets, cutter radius compensation and tool wear compensation	
	21	**Unit-5** -Problems in CNC Machines, Common problems in CNC machines related to mechanical,	
8th	**22**	electrical and pneumatic, electronic components.	Practical-5 Develop a part programme for the following milling operation and make the job on CNC milling - Plain milling - Slot milling - Contouring - Pocket milling
	23	Study of common problems and remedies,	
	24	use of on-time fault finding diagnosis tools in CNC machines	
9th	**25**	**SESSIONAL TEST -II**	Practical-6- Preparation of work instructions for machine operator
	26	**Unit-6-** Automation and NC system	
	27	Concept of automation,	
10th	**28**	emerging trends in automation,	Practical-6- Preparation of preventive maintenance schedule for CNC machine.
	29	Automatic assembly.	
	30	Overview of FMS, Group technology,	
11th	**31**	CAD/CAM	Practical-7 Demonstration through industrial visit for awareness of actual working of FMS in production
	32	CIM	
	33	**Unit-7-** Robot Technology	
12th	**34**	Introduction to robot technology,	Repeat Practical 5 to 8
	35	basic robot motion	
	36	and its applications	
13th	**37**	**SESSIONAL TEST -III**	Repeat Practical 5 to 8
	38	**Revised Sessional Test -1**	
	39	**Revised Sessional Test -2**	
14th	**40**	**Revised Sessional Test -3**	Repeat Practical 5 to 8
	41	Seminar	
	42	Seminar	
15th	**43**	Any Other Quary	Repeat Practical