Lesson Plan

Name of the faculty: Sh. Sandeep Dhandhi, Lecturer in Mechanical Engg.

Discipline: Mechanical

Semester: 5th Mechanical A & B

Subject: CNC Machines and Automation

Lesson Plan Duration: 15 weeks

Work Load (Lecture/ Practical) per week (in hours): Lecturers- 03, Practicals-02

Week	Theory		Practical	
	Lecture day	**Topic (including assignment / test)**	**Practical Day**	**Topic**
1st	1st	Introduction to NC, CNC & DNC	1st	Study of constructional detailof CNC lathe
	2nd	Their advantages, disadvantagesand applications.		
	3rd	Basic components of CNC machines.	2nd	Study of constructional detailof CNC lathe
2nd	1st	Machine Control Unit. Input devices	1st	Study of constructional detailof CNC milling machine
	2nd	selection of components to be machined on CNC machines.		
	3rd	Axis identification.	2nd	Study of constructional detail of CNC milling machine
3rd	1st	Design features, specification of CNC machines.	1st	Study the constructional details and working of Automatic tool changer and Multiple pallets
	2nd	Use of slideways, balls, rollers and coatings, motor and leadscrew, swarf removal, safety and guarding devices.		
	3rd	various cutting tools for CNC machines.	2nd	Study the constructional details and working of Automatic tool changer and Multiple pallets
4th	1st	Concept of CNC tool holder.	1st	Develop a part programme for following lathe operationsand make the job on CNC lathe. - Plain turning and facing operation - Taper turning operation - Circular interpolation
	2nd	different pallet systems and automatic tool changer system.		
	3rd	Management of a tool room.	2nd	Develop a part programme for following lathe operationsand make the job on CNC lathe. - Plain turning and facing operation - Taper turning operation - Circular interpolation
5th	1st	Control system	1st	Develop a part programme for the following milling operation and make the jobon CNC milling - Plain milling - Slot milling - Contouring - Pocket milling
	2nd	Open loop and Closed Loop system		
	3rd	concept of Actuators	2nd	Develop a part programme for the following milling operation and make the jobon CNC milling - Plain milling - Slot milling - Contouring - Pocket milling

6th	1st	Transducers and Sensors	1st	Preparation of work instructions for machine operator
	2nd	Tachometer		
	3rd	LVDT	2nd	Preparation of work instructions for machine operator
7th	1st	opto- interrupters		Preparation of preventive maintenance schedule for CNC machine.
	2nd	potentiometers of linear		
	3rd	angular position		Preparation of preventive maintenance schedule for CNC machine.
8th	1st	encoder	1st	Demonstration through industrial visit for awarenessof actual working of FMS in production.
	2nd	decoder		
	3rd	axis drives	2nd	Demonstration through industrial visit for awarenessof actual working of FMS in production.
9th	1st	Introduction to part programming		
	2nd	basic concepts of part programming		
	3rd	NC words		
10th	1st	part programming formats		
	2nd	simple programming for rational components		
	3rd	part programming using connedcycles		
11th	1st	subroutines and do loops, tool off sets		
	2nd	cutter radius compensation andtool wear compensation.		
	3rd	Common problems in CNC machines related to mechanical		
12th	1st	Electrical and pneumatic, electronic components.		
	2nd	Study of common problem and remedies.		
	3rd	Use of on- time fault finding diagnosis tools in CNC machines.		
13th	1st	Concept of automation		
	2nd	emerging trends in automation		
	3rd	automatic assembly		
14th	1st	Overview of FMS		
	2nd	Group technology		
	3rd	CAD/ CAM and CIM.		
15th	1st	Introduction to robot technology		.
	2nd	basic robot motion		
	3rd	Its applications.		