

## Lecture Plan

Name of Institute : Ambala College of Engineering and Applied Research  
 Name of the Faculty member : Gurpinder Singh  
 Discipline : Mechanical Engineering  
 Semester : 7<sup>th</sup>  
 Subject : Automation in Manufacturing (MCA -401)  
 Lesson Plan Duration : 15 weeks (from Sep 2021 to Jan 2022)  
 Work Load : L-3

Week	Theory		Practical	
	Lecture day	Topic (including assignment/ test)		
1 <sup>st</sup>	1	Production system, automation in production system		
	2	Manual labour in production system, automation principle and strategies		
	3	Manufacturing industries and products, manufacturing operations, product facilities		
2 <sup>nd</sup>	4	Product / production relationship, basic elements of an automation system		
	5	Advance automation function, level of automation		
	6	Robot anatomy and related attributes, joint and links		
3 <sup>rd</sup>	7	Common robot configuration, joint drive system		
	8	Sensors in robotics, robot control system, end effectors, processing operation, assembly and inspection, robot programming		
	9	Grippers and tools, applications of industrial robots, material handling		
4 <sup>th</sup>	10	Processing operation, assembly and inspection, robot programming		
	11	Part families, parts classifications and coding, production flow analysis, cellular Manufacturing- composite part concept		
	12	Part families, parts classifications and coding		
5 <sup>th</sup>	13	Production flow analysis		
	14	Cellular Manufacturing- composite part concept		
	15	Machine cell design, applications of group technology		
6 <sup>th</sup>	16	Grouping parts and machines by rank order clustering technique, Arranging machines in a G.T. cell.		
	17	Introduction, FMS components		
	18	flexibility in manufacturing – machine, product, routing		
7 <sup>th</sup>	19	Operation, types of FMS, FMS layouts		
	20	FMS planning and control issues		

	21	Deadlock in FMS, FMS benefits and applications.		
8 <sup>th</sup>	22	Introduction, manual process planning		
	23	Computer aided process planning – variant, generative		
	24	Decision logic decision tables, decision tree		
9 <sup>th</sup>	25	Introduction to artificial intelligence		
	26	Introduction, shop floor control features, major displays		
	27	Major reports, phases of SFC, order release, order scheduling		
10 <sup>th</sup>	28	Order progress, manufacturing control, methodology, applications		
	29	Shop floor data collections, Types of data collection system		
	30	Data input techniques, automatic data, collection system.		
11 <sup>th</sup>	31	Introduction, historical, background, basic components of an NC		
	32	Steps in NC, verifications of numerical control machine tool programs		
	33	classification of NC Machine tool		
12 <sup>th</sup>	34	Basics of motion control and feedback for NC M/C, automatically programmed tools,		
	35	NC part programming, part programming methods,		
	36	Modern machining system ,DNC, adaptive control.		
13 <sup>th</sup>	37	Functions of AGV, types of AGV		
	38	Safety consideration for AGV		
	39	Design of AGV		
14 <sup>th</sup>	40	Introduction to storage system, storage system performance		
	41	Storage location strategies, conventional storage method and equipment		
	42	automated storage system, , fixed aisle automated storage/ retrieval systems		
15 <sup>th</sup>	43	fixed aisle automated storage/ retrieval system,		
	44	Carousel storage systems		
	45	Analysis of storage system		

Gurpinder Singh  
(Signature of the teacher concerned with date)