

**K. D. K. COLLEGE OF ENGINEERING, NAGPUR**  
**DEPARTMENT OF MECHANICAL ENGINEERING**  
**Session 2021 - 2022**

**Format F1 - Teaching Plan**

Department :- Mechanical Engineering  
 Sub. Code No. :- BEME804T  
 Semester :- VIII Semester

Subject :- **Automation In Production**  
 Period /Week :- 04

Lecture No.	Teaching Code Unit	Contents
1.	101.	Automation -Definition, types, reasons for automating, arguments for and against automation.
2.	102.	Organization and information processing in manufacturing.
3.	103.	Automated Flow Lines- Methods of work part transport, Transfer mechanisms, Buffer storage.
4.	104.	Analysis of flow lines -General terminology and analysis,
5.	105.	analysis of transfer lines without storage,
6.	106.	partial automation, automated flow lines with storage buffers, manual assembly lines. Line Balancing Problem, Methods of line balancing.
7.	107.	Automated Assembly Systems -Types, part delivery system
8.	201.	Numerical Control Production Systems -Basic concepts, coordinate system and machine motion
9.	202.	Types of NC systems -Point to point, straight cut and continuous path. Machine control unit and other components,
10.	203.	Part programming, tape formats,
11.	204.	NC words, method of part programming,
12.	205.	manual part programming:
13.	206.	APT programming, Directed numerical control
14.	207.	Computer numerical control. Adaptive control.
15.	208.	Applications of NC
16.	301.	: Industrial Robotics -Introduction, robot anatomy
17.	302.	accuracy and repeatability and other specifications, end effectors, sensors
18.	303.	introduction to robot programming, safety monitoring
19.	304.	Robot applications -Characteristics of robot applications,
20.	305.	work cell layout,
21.	306.	robot applications in material handling, processing ,assembly and inspection.
22.	401.	Automated material handling & storage: Automated Guided Vehicle Systems -Types: Driverless, trains,
23.	402.	AGVS pallet trucks, AGVS unit-load carriers. Vehicle guidance & routing
24.	403.	Traffic control & safety, System management, Analysis of AGVS systems, AGVS applications.
25.	404.	Automated Storage & Retrieval System
26.	405.	Types: Unit load AS/RS, mini load AS/RS,
27.	406.	man on board AS/RS, automated item retrieval system,
28.	407.	deep lane AS/RS - Basic components & special features of AS/RS.
29.	408.	Carousel storage systems, work in process quantitative analysis.
30.	501.	<b>Automated inspection &amp; Group technology:</b> Automated inspection principles & methods -100% automated inspection,
31.	502.	off-line & on -line inspection, distributed inspection & final inspection;
32.	503.	Sensor technologies
33.	504.	automated inspection, coordinate. measuring Machine Construction, operation & benefits,
34.	505.	Machine vision image acquisition & digitization,
35.	506.	image processing & analysis, interpretation, machine vision applications;
36.	507.	Group Technology: Part families, parts classification & coding, Opitz classification systems production.
37.	508.	Flow analysis; Machine cell design -composite pat concept, types of cell design, best machine arrangement, benefits of group technology.
38.	601.	Computer aided manufacturing - Manufacturing planning, manufacturing control
39.	602.	Computer integrated manufacturing.
40.	603.	Flexible manufacturing systems - Components, Types of systems, FMS layout configuration computer functions
41.	604.	data files, system reports, FMS benefits.
42.	605.	Computer aided process planning - Retrieval CAPP systems, generative CAPP systems, benefits of CAPP.

**DR P R GAJBHIYE**

**Subject Teacher**