

GOVERNMENT POLYTECHNIC, NUAPADA
Academic Lesson Plan for Summer semester- 2024-25

Name of the teaching faculty: Er. Michael Suveer Department: Mechanical Engineering
Semester: 6th Subject: Industrial Robotics and Automation
No. of periods per week: 4 Total Periods: 60
End semester exam: 80 Class test: 20
Total Marks : 100

Sl. No.	Week	Period	Topic to be covered
1.	1 st	1 st	Fundamental of Robotics: Definition, Robot anatomy(parts) and its working.
2.		2 nd	Do
3.		3 rd	Robot Components: Manipulator, End effectors, Construction of Links, Types of Joints.
4.		4 th	Do
5.	2 nd	1 st	Classification of Robots: Cartesian, Cylindrical, Spherical, Scara, Vertical articulated
6.		2 nd	Do
7.		3 rd	Structural characteristics of robots: Mechanical rigidity, Effects of structure on control work envelope and work volume.
8.		4 th	Do
9.	3 rd	1 st	Robot work volumes, comparison
10.		2 nd	Advantages and disadvantages of robots
11.		3 rd	Robotic Drive System and Controller: Actuators- hydraulic, pneumatic
12.		4 th	Do
13.	4 th	1 st	Electrical drives, Linear actuator, Rotary drives.
14.		2 nd	Do
15.		3 rd	AC servo motor, DC servo motor, Stepper motors, Conversion between linear & rotary motion
16.		4 th	Do
17.	5 th	1 st	Feedback devices, Potentiometers, Optical encoders, DC tachometers
18.		2 nd	Do
19.		3 rd	Robot controller, Level of controller, Open & Closed Loop Controller
20.		4 th	Microprocessor based control system, Robot control path, point to point, continuous path control & sensor based path control, controller programming
21.	6 th	1 st	Sensors: Requirements of a sensor
22.		2 nd	Do
23.		3 rd	Principles & applications of sensors
24.		4 th	Do
25.	7 th	1 st	Classification of sensors- Position sensors(Encoders, Resolvers, Piezo Electric)
26.		2 nd	Do
27.		3 rd	Range sensors(Triangulation Principle)
28.		4 th	Do
29.	8 th	1 st	Range sensors(Structured lighting approach)

30.		2 nd	Proximity sensing, Force and Torque sensing.
31.		3 rd	Introduction to Machine Vision
32.		4 th	Do
33.		9 th	1 st
34.		2 nd	Do
35.		3 rd	Image processing and analysis.
36.		4 th	Do
37.		10 th	1 st
38.		2 nd	Do
39.		3 rd	Videocon Camera- Construction, Applications of Robot vision system
40.		4 th	Inspection, Identification, Navigation, Serving
41.		11 th	1 st
42.		2 nd	Do
43.		3 rd	Forward Kinematics, Inverse Kinematics & Differences.
44.		4 th	Do
45.		12 th	1 st
46.		2 nd	Do
47.		3 rd	Deviations and problems, Teach Pendant programming
48.		4 th	Do
49.		13 th	1 st
50.		2 nd	Do
51.		3 rd	Motion commands, Sensor commands, End effector commands & Simple programs
52.		4 th	Do
53.		14 th	1 st
54.		2 nd	Automation and Industrial Applications
55.		3 rd	Do
56.		4 th	Basic elements of automated system
57.		15 th	1 st
58.		2 nd	Levels of Automation
59.		3 rd	Applications of Robots in Machining
60.		4 th	Welding, assembly and material handling

The lesson plan prepared by the concerned faculty

Micheal Suveer

Mic'hael Suveer

GOVERNMENT POLYTECHNIC, NUAPADA
Academic Lesson Plan for Summer semester- 2024-25

Name of the teaching faculty: Er. Michael Suveer
 Semester: 4th
 No. of periods per week: 4
 End semester exam: 80
 Total Marks: 100

Department: Mechanical Engineering
 Subject: Manufacturing Technology
 Total Periods: 60
 Class test: 20

Sl. No.	Week	Period	Topic to be covered
1.	1 st	1 st	Composition of various tool materials
2.		2 nd	Composition of various tool materials
3.		3 rd	Physical tool materials
4.		4 th	Uses of such tool materials.
5.	2 nd	1 st	Cutting action of various and tools such as Chisel, hacksaw blade
6.		2 nd	Cutting action of various and tools such as dies and reamer
7.		3 rd	Turning tool geometry
8.		4 th	Purpose of tool angle
9.	3 rd	1 st	Machining process parameters (Speed, feed and depth of cut)
10.		2 nd	Coolants and lubricants in machining and purpose
11.		3 rd	Do
12.		4 th	Construction and working of lathe and CNC lathe
13.	4 th	1 st	Major components of a lathe and their function
14.		2 nd	Operations carried out in a lathe
15.		3 rd	Safety measures during machining
16.		4 th	Difference with respect to engine lathe
17.	5 th	1 st	Major components of a lathe and their function
18.		2 nd	Draw the tooling lay out for preparation of a hexagonal bolt & bush
19.		3 rd	Applications of shaper
20.		4 th	major components of shaper
21.	6 th	1 st	Automatic table feed mechanism
22.		2 nd	construction & working of tool head
23.		3 rd	Quick return Mechanism
24.		4 th	Specification of shaper
25.	7 th	1 st	Application area of a planer and its difference with respect to shaper
26.		2 nd	Do
27.		3 rd	Major components and their functions
28.		4 th	The table drive mechanism
29.	8 th	1 st	Working of tool and tool support
30.		2 nd	Clamping of work through sketch.
31.		3 rd	Types of milling machine and operations performed by them
32.		4 th	Do
33.	9 th	1 st	CNC milling machine
34.		2 nd	Explain work holding attachment
35.		3 rd	Construction & working of dividing Head
36.		4 th	Do
37.	10 th	1 st	Procedure of simple and compound indexing
38.		2 nd	Illustration of different indexing methods
39.		3 rd	Major components and their function
40.		4 th	Do

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36.		4 th	Do
37.	10 th	1 st	Procedure of simple and compound indexing
38.		2 nd	Illustration of different indexing methods
39.		3 rd	Major components and their function
40.		4 th	Do

41.	11 th	1 st	Construction and working of slotter machine
42.		2 nd	Construction & working of deviding Head
43.		3 rd	Do
44.		4 th	Do
45.	12 th	1 st	Tools used in slotter
46.		2 nd	Do
47.		3 rd	Significance of grinding operations
48.		4 th	Manufacturing of grinding wheels
49.	13 th	1 st	Do
50.		2 nd	Specification of grinding wheel
51.		3 rd	Do
52.		4 th	Surface and centerless grinder
53.	14 th	1 st	Classification of drilling Machines
54.		2 nd	Working of drilling Machines
55.		3 rd	Do
56.		4 th	Boring
57.	15 th	1 st	Broaching
58.		2 nd	Surface finishing
59.		3 rd	Do
60.		4 th	Do

The lesson plan prepared by the concerned faculty

Michael Suveer

Michael Suveer

GF, MECHANICAL DEPARTMENT

GOVERNMENT POLYTECHNIC, NUAPADA
Academic Lesson Plan for Summer semester- 2024-25

Name of the teaching faculty: Er. Michael Suveer

Department: Mechanical Engineering

Semester: 4th

Subject: : WORKSHOP PRACTICE-III

No. of periods per week: 6

Total Periods: 90

End semester exam: 50 Sessional: 50 Total Marks: 100

Sl. No	Week	Period	Topic to be covered
1	1 st	1 st	Job in evolving drilling, boring
2		2 nd	Do
3		3 rd	Do
4		4 th	Do
5		5 th	Do
6		6 th	Do
7	2 nd	1 st	Do
8		2 nd	Do
9		3 rd	Do
10		4 th	Do
11		5 th	Do
12		6 th	Do
13	3 rd	1 st	Do
14		2 nd	Do
15		3 rd	Do
16		4 th	Internal/External threading on Turning jobs
17		5 th	Do
18		6 th	Do
19	4 th	1 st	Do
20		2 nd	Do
21		3 rd	Do
22		4 th	Do
23		5 th	Do
24		6 th	Do
25	5 th	1 st	Do
26		2 nd	Do
27		3 rd	Do
28		4 th	Do
29		5 th	Do
30		6 th	Do
31	6 th	1 st	Job in evolving use of Capstan and turret lathe (Taper Turning & Chamfering)
32		2 nd	Do
33		3 rd	Do
34		4 th	Do
35		5 th	Do
36		6 th	Do
37	7 th	1 st	Do
38		2 nd	Do
39		3 rd	Do
40		4 th	Do
41		5 th	Do
42		6 th	Do
43	8 th	1 st	Do
44		2 nd	Do

45		3 rd	Do
46		4 th	All gear lathe, CNC Lathe Trainer Practice
47		5 th	Do
48		6 th	Do
49	9 th	1 st	Do
50		2 nd	Do
51		3 rd	Do
52		4 th	Job involving all turning process on MS Rod & aluminum rod for jobs using CNC Lathe trainer.
53		5 th	Do
54		6 th	Do
55	10 th	1 st	Do
56		2 nd	Do
57		3 rd	Do
58		4 th	Do
59		5 th	Do
60		6 th	Do
61	11 th	1 st	Shaper Preparation of V Block on CI or MS Blocks
62		2 nd	Do
63		3 rd	Do
64		4 th	Do
65		5 th	Do
66		6 th	Do
67	12 th	1 st	Do
68		2 nd	Do
69		3 rd	Do
70		4 th	Do
71		5 th	Do
72		6 th	Do
73	13 th	1 st	Do
74		2 nd	Do
75		3 rd	Do
76		4 th	Milling Machine Preparation of Spur gear on CI or MS round
77		5 th	Do
78		6 th	Do
79	14 th	1 st	Do
80		2 nd	Do
81		3 rd	Do
82		4 th	Do
83		5 th	Do
84		6 th	Do
85	15 th	1 st	Do
86		2 nd	Do
87		3 rd	Do
88		4 th	Do
89		5 th	Do
90		6 th	Do

The lesson plan prepared by the concerned faculty

Michael Sweeney
Michael Sweeney

GF, MECHANICAL DEPARTMENT

GOVERNMENT POLYTECHNIC, NUAPADA

Academic Lesson Plan for Summer semester- 2024-25

Name of the teaching faculty: Er Michael Suveer

Department: Mechanical Engineering

Semester: 2nd

Subject: : Workshop Practice

No. of periods per week: 4

Total Periods: 60

Sl. No	Week	Period	Topic to be covered
1	1 st	1 st	Carpentry- Demonstration of different wood working tools/machines
2		2 nd	Do
3		3 rd	Demonstration of different wood working processes like planing, marking, chiseling, grooving, turning of wood etc
4		4 th	Do
5		5 th	Do
6		6 th	One simple job involving any one joint like Mortise & Tenon dovetail, bridle, halflap etc
7	2 nd	1 st	Do
8		2 nd	Do
9		3 rd	Do
10		4 th	Do
11		5 th	Fitting- Introduction to Fitting
12		6 th	Do
13	3 rd	1 st	Demonstration of different fitting tools and drilling machines and power tools
14		2 nd	Do
15		3 rd	Do
16		4 th	Demonstration of different operations like chipping, filing, drilling, tapping, sawing, cutting, etc.
17		5 th	Do
18		6 th	Do
19	4 th	1 st	One simple fitting job involving practice of chipping, filing, drilling, tapping, cutting, etc
20		2 nd	Do
21		3 rd	Welding: Introduction to Welding
22		4 th	Do
23		5 th	Demonstration of different welding tools and machines
24		6 th	Do

25	5 th	1 st	Do
26		2 nd	Demonstration on arc welding, gas welding, MIG, Mag welding, gas cutting, and rebuilding of broken parts with welding
27		3 rd	Do
28		4 th	One simple job involving butt and lap joint
29		5 th	Do
30		6 th	Do
31	6 th	1 st	Sheet Metal Working: Introduction
32		2 nd	Demonstration of different sheet metals, tools/machines
33		3 rd	Do
34		4 th	Demonstration of different sheet metal operations like sheet cutting, beending, edging and curling, lancing, soldering, brazing and riveting
35		5 th	Do
36		6 th	Do
37	7 th	1 st	Do
38		2 nd	One simple job involving sheet metal operations and soldering and riveting
39		3 rd	Do
40		4 th	Do
41		5 th	Electrical House Wiring: Introduction
42		6 th	Practice on simple lamp circuits
43	8 th	1 st	Do
44		2 nd	One lamp controlled by one switch by surface conduit wiring
45		3 rd	Do
46		4 th	Lamp circuits connection of lamp and socket by separate switches
47		5 th	Do
48		6 th	Connection of fluorescent lamp/tubelight
49	9 th	1 st	Do
50		2 nd	Simple lamp circuits install bedroom lighting
51		3 rd	Do
52		4 th	Simple lamp circuits install staircase wiring
53		5 th	Do
54		6 th	Demonstration: Demonstration of measurement of current, voltage, power and energy
55	10 th	1 st	Do
56		2 nd	Demonstration of advance power tools, pneumatic tools, electrical wiring tools and accessories
57		3 rd	Do
58		4 th	Tools for cutting and drilling
59		5 th	Do
60		6 th	Record submission

The lesson plan is prepared by concerned faculty

Michael Suvver
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GF, Mechanical department