RGPV (	(DIPLO	OMA WIN	NG)		CULUM FOR THE DURSE	FORMA	Т-3	Sheet No. 1/3				
Branch			Med	chanical Engineeri	ng	Semester		V				
Course (	Code	503		Course Name	Manufacturing T	Techniques	and Sy	rstems				
Course C	Outcon	ne 1	Prep tools		ing given conventiona	Semester  echniques and machine The second of Conventional machine to the second of Convention of Co	Teach Hrs	Marks				
Learning	g Outc	ome 11			nd working of a given ool using neat sketches		10 10					
C	Conten	ts	Open Mac Open Spec Type princ	ventional Machining rations, specification hine, Types of I rations and applicate diffication and Apples of Boring machining	ns and applications. Volumes and applications. Willing Machines, Milling Dilling Machine: lications. Working prehine. Grinding Machine.	Definition, Parametrian Print	arts, and ciple of arts, of Boring action,	d Types, f Milling Milling perations, machine, Working				
Method	of Asse	essment		**	Progressive Test-I)	oo, worming printerpre, operation						
Learning			Paper pen Test (Part of Progressive Test-I)  Prepare a job as per given specification with safety precautions using given conventional machine tools.									
	Conten				5							
Method o								)				
Course C	Outcon	ne 2				Semester  ring Techniques and Systemational machine given etches  Introduction, classifications. Working Principle of the services, Milling Cutters and the achine: Definition, Parts, opening principle of Boring of Machine: Introduction, Very achine tools.  The conventional machine tools are semester practical examy the semester practical examy the semester of Unconventional machine, Working principle, O sketches  The conventional machine tools are semester practical examy the semester of Unconventional tional Machining, Working plications of Unconventional machine, Electric Discharge Ultra Sonic Machining, Working plications of Unconventional Machining, Electric Discharge Ultra Sonic Machining, Water of Unconventional machine tools.  The conventional machine tools are semester practical examy the semester practical	1					
Learning	g Outc	ome 21	unco	nventional machine	nd working of a given tool using neat sketch			20				
	Conten		Prince Mac Mac Mac Mac macl	nining and advantage ciple, Operating Parthining Methods-Electron beathining, Electron beathining, LASER Beathining	ges of Unconventional Mameters and Application of Chemical Machinian Machining, Ultra Somm Machining, Plasma	Machining, Wons of Unconving, Electric lonic Machini	Vorking ventiona Discharang, Abra	al ge asive Jet				
Method	of Asse	essment		ory exam (Part of en			1	1				
Learning	g Outc	ome 22	_		en specification with sa unconventional machin		12	10				
	Conten		Dem	onstration of prepar	ration of jobs on uncor	nventional ma	achine to	ools.				
Method o												
Course C	Outcon	ne 3	Writ	te a part program	for a given componen	t.		Marks				
Learning	g Outc	ome 31	Desc	ribe NC controls ar	nd its classifications		08	5				
Learning Outcome 31 Describe NC controls and its classifications 08  Numerical control, Computer Numerical control, Direct Numerical and part programming, applications and operations of machine tool. Classification of NC system,												

Contents				
Method of Assessment	Paper pen Test (Part of Progressive Test-II)	nt of NC systems, Applications of NC machin antages, Operation of NC m/c tool system, Basis system, Motion control in NC, Classification of eration, application and advantages ,DNC avantages and ACO and ACC adoptive control. The ester exam by the system of the system		
<b>Learning Outcome 32</b>	Explain working of NC, CNC, DNC and adaptive control	08	15	
	using block diagrams			
	Numerical control, Component of NC systems, Application	ns of NC	machine	
	tool, Advantages and Disadvantages, Operation of NC m/c	tool syste	em, Basic	
	length unit, NC co-ordinates system, Motion control in NC	, Classif	ication of	
	NC controls - CNC - operation, application and adv	antages	,DNC -	
Contents	components, functions and advantages and ACO and ACC a	adoptive	control.	
Method of Assessment	Theory exam (Part of end semester exam )			
Learning Outcome 33	Write a Part program using codes for preparatory and	06	10	
8	miscellaneous functions for a given component			
	Part programming-program format, steps in CAPP, Code	for pre	paratory	
Contents	and miscellaneous functions (G and M code), preparation	on of sn	nall part	
	program, NC word, CANNED Cycle.			
Method of Assessment	Assignment(Part of term work)			
Learning Outcome 34	Run a given part program on a simulator or a CNC	08	10	
	machine tool .			
Contents	Demonstration of execution of a part program on a Simulati	on		
35 (1 1 0 4	Software/CNC Machine tool.			
Method of Assessment	Laboratory test by observation(Part of lab work)	T 1	3.6 1	
Course Outcome 4	Explain the Flexible Manufacturing Systems,	Lleach	Marks	
000000000000000000000000000000000000000	• •		Warks	
	Robotics, CIM, Manufacturing, Artificial Intelligence		Warks	
	Robotics, CIM, Manufacturing, Artificial Intelligence and Machine Learning	Hrs		
Learning Outcome 41	Robotics, CIM, Manufacturing, Artificial Intelligence	Hrs		
	Robotics, CIM, Manufacturing, Artificial Intelligence and Machine Learning	Hrs 08	10	
	Robotics, CIM, Manufacturing, Artificial Intelligence and Machine Learning  Describe FMS, Robotics using suitable diagrams	Hrs 08	10	
	Robotics, CIM, Manufacturing, Artificial Intelligence and Machine Learning  Describe FMS, Robotics using suitable diagrams  Flexible Manufacturing Systems: Elements, Limitation	Hrs 08 ons, Fea	10 ature &	
	Robotics, CIM, Manufacturing, Artificial Intelligence and Machine Learning  Describe FMS, Robotics using suitable diagrams  Flexible Manufacturing Systems: Elements, Limitation Characteristics, New development.  Robotics: Introduction to robotics, Law of robotics, Elesystem, Industrial and Non Industrial applications, selestics.	Hrs  08  ons, Featherments of	10 ature & of Robot	
Learning Outcome 41  Contents	Robotics, CIM, Manufacturing, Artificial Intelligence and Machine Learning  Describe FMS, Robotics using suitable diagrams  Flexible Manufacturing Systems: Elements, Limitation Characteristics, New development.  Robotics: Introduction to robotics, Law of robotics, Elesystem, Industrial and Non Industrial applications, selections.	Hrs  08  ons, Featherments of	10 ature & of Robot	
Learning Outcome 41  Contents  Method of Assessment	Robotics, CIM, Manufacturing, Artificial Intelligence and Machine Learning  Describe FMS, Robotics using suitable diagrams  Flexible Manufacturing Systems: Elements, Limitation Characteristics, New development.  Robotics: Introduction to robotics, Law of robotics, Elesystem, Industrial and Non Industrial applications, selesystem, Industrial applica	Hrs  08  ons, Featherments of the certain critical critic	10 ature & of Robot iteria of	
Learning Outcome 41  Contents	Robotics, CIM, Manufacturing, Artificial Intelligence and Machine Learning  Describe FMS, Robotics using suitable diagrams  Flexible Manufacturing Systems: Elements, Limitation Characteristics, New development.  Robotics: Introduction to robotics, Law of robotics, Elements, Industrial and Non Industrial applications, selements, Industrial and Non Industrial applications, selements.  Theory exam (Part of end semester exam )  Describe CIM, JITM and Lean manufacturing.	Hrs  08  ons, Featherments of the control of the co	10 ature & of Robot iteria of 05	
Learning Outcome 41  Contents  Method of Assessment	Robotics, CIM, Manufacturing, Artificial Intelligence and Machine Learning  Describe FMS, Robotics using suitable diagrams  Flexible Manufacturing Systems: Elements, Limitation Characteristics, New development.  Robotics: Introduction to robotics, Law of robotics, Elesystem, Industrial and Non Industrial applications, selesystem, Industrial and Non Industrial applications, selesystem (Part of end semester exam )  Describe CIM, JITM and Lean manufacturing.  Computer Integrated Manufacturing: Concepts, Elements, by	Hrs  08  ons, Featherments of the control of the co	10 ature & of Robot iteria of 05	
Contents  Method of Assessment Learning Outcome 42	Robotics, CIM, Manufacturing, Artificial Intelligence and Machine Learning  Describe FMS, Robotics using suitable diagrams  Flexible Manufacturing Systems: Elements, Limitation Characteristics, New development.  Robotics: Introduction to robotics, Law of robotics, Elesystem, Industrial and Non Industrial applications, selesystem, Industrial and Non Industrial applications, selesystem, Industrial and Non Industrial applications, selesystem (Part of end semester exam.)  Describe CIM, JITM and Lean manufacturing.  Computer Integrated Manufacturing: Concepts, Elements, Erequirement.	Hrs  08  ons, Featherments of the control of the co	10 ature & of Robot iteria of 05 and basic	
Learning Outcome 41  Contents  Method of Assessment	Robotics, CIM, Manufacturing, Artificial Intelligence and Machine Learning  Describe FMS, Robotics using suitable diagrams  Flexible Manufacturing Systems: Elements, Limitation Characteristics, New development.  Robotics: Introduction to robotics, Law of robotics, Elements, Industrial and Non Industrial applications, selements, Industrial and Non Industrial applications, selements, Elements (Part of end semester exam)  Describe CIM, JITM and Lean manufacturing.  Computer Integrated Manufacturing: Concepts, Elements, El	Hrs  08  ons, Featherments of the control of the co	10 ature & of Robot iteria of 05 and basic	
Contents  Method of Assessment Learning Outcome 42  Contents	Robotics, CIM, Manufacturing, Artificial Intelligence and Machine Learning  Describe FMS, Robotics using suitable diagrams  Flexible Manufacturing Systems: Elements, Limitation Characteristics, New development.  Robotics: Introduction to robotics, Law of robotics, Elesystem, Industrial and Non Industrial applications, selesystem, Industrial and Lean manufacturing.  Computer Integrated Manufacturing: Concepts, Elements, Frequirement.  Just In Time Manufacturing: concepts, elements, Push Kanban concept, lean manufacturing.	Hrs  08  ons, Featherments of the control of the co	10 ature & of Robot iteria of 05 and basic	
Learning Outcome 41  Contents  Method of Assessment Learning Outcome 42  Contents  Method of Assessment	Robotics, CIM, Manufacturing, Artificial Intelligence and Machine Learning  Describe FMS, Robotics using suitable diagrams  Flexible Manufacturing Systems: Elements, Limitation Characteristics, New development.  Robotics: Introduction to robotics, Law of robotics, Elements, Industrial and Non Industrial applications, selements.  Theory exam (Part of end semester exam )  Describe CIM, JITM and Lean manufacturing.  Computer Integrated Manufacturing: Concepts, Elements, Frequirement.  Just In Time Manufacturing: concepts, elements, Push Kanban concept, lean manufacturing.  Theory exam (Part of end semester exam )	Hrs  08  ons, Featherments of the certification of	10 ature & of Robot iteria of 05 and basic system,	
Contents  Method of Assessment Learning Outcome 42  Contents	Robotics, CIM, Manufacturing, Artificial Intelligence and Machine Learning  Describe FMS, Robotics using suitable diagrams  Flexible Manufacturing Systems: Elements, Limitation Characteristics, New development.  Robotics: Introduction to robotics, Law of robotics, Elesystem, Industrial and Non Industrial applications, selesystem, Indus	Hrs  08  ons, Featherments of the certification of	10 ature & of Robot iteria of 05 and basic system,	
Learning Outcome 41  Contents  Method of Assessment Learning Outcome 42  Contents  Method of Assessment	Robotics, CIM, Manufacturing, Artificial Intelligence and Machine Learning  Describe FMS, Robotics using suitable diagrams  Flexible Manufacturing Systems: Elements, Limitation Characteristics, New development.  Robotics: Introduction to robotics, Law of robotics, Elesystem, Industrial and Non Industrial applications, selesystem, Industrial applications,	Hrs  08  ons, Featherments of the certification of	10 ature & of Robot iteria of of Robot iteria of os and basic system,	
Contents  Method of Assessment Learning Outcome 42  Contents  Method of Assessment Learning Outcome 43	Robotics, CIM, Manufacturing, Artificial Intelligence and Machine Learning  Describe FMS, Robotics using suitable diagrams  Flexible Manufacturing Systems: Elements, Limitation Characteristics, New development.  Robotics: Introduction to robotics, Law of robotics, Elesystem, Industrial and Non Industrial applications, selesystem, Industrial applications, Industrial applica	Hrs  08  ons, Featherments of the certain critical critic	10 ature & of Robot iteria of 05 and basic system, 05	
Learning Outcome 41  Contents  Method of Assessment Learning Outcome 42  Contents  Method of Assessment	Robotics, CIM, Manufacturing, Artificial Intelligence and Machine Learning  Describe FMS, Robotics using suitable diagrams  Flexible Manufacturing Systems: Elements, Limitation Characteristics, New development.  Robotics: Introduction to robotics, Law of robotics, Elements, Industrial and Non Industrial applications, selements, Industrial and Non Industrial applications, selements, Elements (Part of end semester exam)  Describe CIM, JITM and Lean manufacturing.  Computer Integrated Manufacturing: Concepts, Elements, Frequirement.  Just In Time Manufacturing: concepts, elements, Push Kanban concept, lean manufacturing.  Theory exam (Part of end semester exam)  Explain Artificial Intelligence and Machine Learning concepts.  Artificial Intelligence and Machine Learning: Introduction of Intelligence (AI), Vertical AI, Horizontal AI.	Hrs  08  ons, Featherments of the control of the co	10 ature & of Robot iteria of 05 and basic system, 05 ital ne	
Contents  Method of Assessment Learning Outcome 42  Contents  Method of Assessment Learning Outcome 43	Robotics, CIM, Manufacturing, Artificial Intelligence and Machine Learning  Describe FMS, Robotics using suitable diagrams  Flexible Manufacturing Systems: Elements, Limitation Characteristics, New development.  Robotics: Introduction to robotics, Law of robotics, Elesystem, Industrial and Non Industrial applications, selesystem, Industrial applications, Industrial applica	Hrs  08  ons, Featherments of the control of the co	10 ature & of Robot iteria of 05 and basic system, 05 ital ne	

Method of Assessment	Paper pen Test (Part of Progressive Test-II)									
Course Outcome 5	Explain a given Additive manufacturing method	Teach	Marks							
		Hrs								
Learning Outcome 51	Describe a given Additive manufacturing method using	08	20							
	diagrams.									
	Introduction, Advantages, Limitations, Classifications, History	•	*							
	of 3D printing, 3DP technology steps, 3D printing ap									
	Additive v/s subtractive Manufacturing processes, Example									
	Construction, Working and Applications of -Fused Deposition Modelin									
	(FDM), Stereo lithography (STL), Selective Laser Sintering (SLS), Multi Jo									
Contents	Fusion (MJF),Laminated object Manufacturing(LOM).	Fusion (MJF), Laminated object Manufacturing(LOM).								
	Additive Manufacturing/3D printing Equipments: Proc	ess Equ	ipment-							
	Design and process parameters, Governing Bonding Med	hanism,	Process							
	Design.									
Method of Assessment	Theory exam (Part of end semester exam )									
<b>Learning Outcome 52</b>	Prepare a STL file using given software for a given CAD	10	10							
	model of a component.									
Contents	Additive manufacturing process steps									
Method of Assessment	Laboratory test by observation (Part of Lab work)									
<b>Learning Outcome 53</b>	Prepare a given job using 3D printing machine or	10	10							
	simulator.									
Contents	Demonstration of preparation of a job using 3D printing ma	chine /sir	nulator							
Method of Assessment	Laboratory test by observation (Part of end semester practic	al exam)								

RGPV (Diploma Wing ) Bhopal		SCHEME FOR LEARNING	Bı	anch (	Code	C	Cour	rse C	ode	CO ode	LO Code	Format No. 4
Not v (Diploma ving) Diopai		OUTCOME	M	0	2	5		0	3	1	1	
COURSE NAME	Manufacturing Tech	anufacturing Techniques and Systems										
CO Description	Prepare a given job usi	repare a given job using given conventional machine tools.										
<b>LO Description</b> Describe construction and working of a given conventional machine tool using neat sketches.												

# **SCHEME OF STUDY**

S. No.	<b>Learning Content</b>	Teaching – Learning Method	Description of T-L Process	Teach Hrs.	Pract. /Tut Hrs.	LRs Required	Remarks
M cl M Cl M D O ap M M ar ap D S W m In S N W	Methods: Introduction, lassification of Conventional Machining, Lathe machine: Definition, Parts, and Types, Operations, specifications and pplications. Working Principle of Milling Machine, Types of Milling Machines, Milling Cutters and Milling Operations and pplication. Drilling Machine: Definition, Parts, operations, Specification and Applications. Working principle of Boring machine, Types of Boring machine. Grinding Machine: Introduction, Working principle. Shaper Machine: Definition, parts, Working principle, Operation and pplications.	Interactive classroom teaching, demonstratio n, quiz, assignments, tutorial	Teacher will explain the contents and provide handouts to students. Teacher will conduct assignments/quiz/tutorial to make students practice their knowledge.	10	NIL	Handouts, chalk board, PPT, text book, charts, video film.	

#### SCHEME OF ASSESSMENT

S. No.	Method of Assessment	Description of Assessment	Maximum Marks	Resources Required	External / Internal
1	Paper pen test	Student will be asked to describe construction and working of a given conventional machine tool with neat sketch.	10	Test paper + Rating scale	Internal

# ADDITIONAL INSTRUCTIONS FOR THE HOD/ FACULTY (IF ANY)

Part of progressive test-I

RGPV (Diploma Wing ) Bhopal		SCHEME FOR LEARNING	Bı	anch	Code	;	C	ours	se Co	ode	CO Code	LO Code	Format No. 4
		OUTCOME	M	0	2	?	5		0	3	1	2	
COURSE NAME	Manufacturing Techniques and Systems												
CO Description	Prepare a given job us	ing given conventional machine too	ls.										
LO Description Prepare a job as per given specification with safety precautions using given conventional machine tools.													
	SCHEME OF STUDY												

S. No.	Learning Content	Teaching – Learning Method	Description of T-L Process	Teach Hrs.	Pract. /Tut Hrs.	LRs Required	Remarks
1	Demonstration of preparation of jobs on conventional machine tools	Interactive classroom teaching, demonstration, quiz, assignments, tutorial	Teacher will explain the contents and provide handouts to students. Teacher will conduct assignments/ quiz/tutorial to make students practice their knowledge.	2	10	Handouts, chalk board, PPT, text book, charts, video film and Conventional machines and lab manual.	

S. No.	Method of Assessment	Description of Assessment	Maximum Marks	Resources Required	External / Internal
1	Laboratory test by observation	Student will be asked to prepare a job of given specifications along with safety precautions using a given conventional machine tool	10	Conventional Machines and Work Piece on Shop Floor/Observation schedule/check-list	External

# ADDITIONAL INSTRUCTIONS FOR THE HOD/ FACULTY (IF ANY)

Part of end semester practical exam

RG	PV (Diplo	oma Wing ) Bhopal		R LEARNING COME		anch C			ourse C		CO Code	LO Code	Format No. 4
	URSE AME	Manufacturing Tech			M	0	2	5	0	3	2	1	
	cription	Prepare a given job us	ing given unconve	ntional machine t	tools.								
	cription	Describe construction a				ne tool ເ	sing n	neat ske	tches.				
	<u> </u>			SCHEME O									
S. No.	L	earning Content	Teaching – Learning Method	Description of Process		Teach Hrs.		ract. it Hrs.	I	Rs Re	quired		Remarks
1	Machin Limitati machini of Machin Principl Paramed Applica Unconv Method Machin Dischar Electron Ultra Abrasiv Laser Plasma	ions of conventional ing and advantages Unconventional ing, Working ing, Operating iters and itions of tentional Machining is-Electro Chemical ing, Electric ing, Electric ing, Machining, in beam Machining, Sonic Machining,	assignments,	Teacher will exp the contents and provide handout students. Teacher conduct assignment quiz/tutorial to restudents practice knowledge.	ts to er will nents/ nake	10		0		text bo	halk boar	·	
				SCHEME OF A	SSESS	MENT							
S. No.	Meth	od of Assessment	Description of A	Assessment		imum arks		]	Resour	ces Re	quired		External / Internal

1	Theory Exam	Student will be asked to describe construction and working of a given unconventional machine tool with neat sketches.	20	Question Paper	External
		ADDITIONAL INSTRUCTIONS FO		ACULTY (IF ANY)	
		Part of end semes	ter theory exam		

RG	PV (Diplo	oma Wing ) Bhopal	SCHEM	IE FOR LEAR OUTCOME	NING		anch C			ourse C		CO Code	LO Code	Format No. 4
		ı		OCICONIE		M	0	2	5	0	3	2	2	
	JRSE ME	Manufacturing T	echniques and	Systems										
CO Desc	cription	Prepare a given job	b using given ur	nconventional m	nachine t	ools.								
LO Desc	cription	Prepare a job as per	given specificat	ion with safety p	recaution	s using	given	unconve	entiona	al machi	ne too	ls.		
				SCH	IEME O	F STUI	ΟY							
S. No.		Learning Conte	ent	Teaching – Learning Method	Descri I	ption o Process	f T-L	Tea Hr		Pract /Tut Hrs.		LRs Req	uired	Remarks
1		monstration of preparation of jobs unconventional machine tools		Interactive classroom teaching, demonstratio n, quiz, assignments, tutorial	Teacher the con provide students will con assignn quiz/tut students their kn	tents and handous. Teach duct hents/orial to spractic	d uts to ner make	2		10	bo bo fil ur m	Handouts, chalk board, PPT, text book, charts, video film, unconventional machines and lab manual.		
				SCHEM	IE OF A	SSESS	MENT	ı						
S. No.	Metho	od of Assessment	Descripti	on of Assessme	nt		imum ırks			Resour	ces Re	quired		External / Internal
1	Laboratory test by observation  Student will be asked to prepa of given specifications along with precautions using a given uncon machine tool.			cations along with	safety	1	.0	Unc			oor/O	es and Wo bservation ck-list		External
'			ADDITIONAL	LINSTRUCTIO	ONS FOR	R THE	HOD/	FACU	LTY (	IF ANY	7)			
				Part of end										

F	RGPV (Diploma Wing ) Bhopal		SCHEME FOR	–	Br	anch Co	de	Co	urse Code		CO Code	LO Code	Format No. 4
			OUIC	OUTCOME			2	5	0	3	3	1	
COURSE NAME Manufacturing Techniques and Systems													
CO Description Write a part program for a given component.													
LO D	Description	Describe NC controls an	nd its classifications.										
		1		SCHEME O	F STU	DY							
S. No.		Learning Content	Teachin g - Learnin g Method	Description of Process	T-L	Teach Hrs.	Pra /Tut		I	LRs Re	quired		Remarks

Teacher will explain

provide handouts to

students. Teacher will

conduct assignments/

quiz/tutorial to make

students practice their

the contents and

knowledge.

Interacti

classroo

teaching,

demonstr

assignme nts, tutorial

ation,

quiz,

ve

m

Numerical control, Computer

Numerical control, Direct

Numerical Control and part

operations of machine tool.,

Classification of NC system,

programming, applications and

8

0

Handouts, chalk board,

PPT, text book, charts,

video film, and lab

manual.

# SCHEME OF ASSESSMENT

S. No.	Method of Assessment	Description of Assessment	Maximum Marks	Resources Required	External / Internal
1	Paper pen test	Student will be asked to describe given NC control systems.	5	Test paper + Rating scale	Internal

# ADDITIONAL INSTRUCTIONS FOR THE HOD/ FACULTY (IF ANY)

Part of progressive test-II

RGP	V (Diploma Wing ) Bhopal	SCHEME FOR	LEARINI	Branch (	Code	Co	ourse C	ode	CO Code	LO Code	Format No. 4	
	OUTCOME		OME M	0	2	5	0	3	3	2		
COUI NAM	Manutacturing Tecl	Manufacturing Techniques and Systems										
CO Descr	ription Write a part program	n for a given compon	ent.									
LO Descr	ription Explain working of NC	C, CNC, DNC and ada	aptive control using bl	ock diagra	ams							
			SCHEME OF ST	CUDY								
S. No	Learning Content	Teaching – Learning	Description of T-I	Teacl	h P	ract.	I	Rs Red	nuired		Remarks	

S. No	Learning Content	Teaching — Learning Method	Description of T-L Process	Teach Hrs.	Pract. /Tut Hrs.	LRs Required	Remarks
1	Numerical control, Component of NC systems, Applications of NC machine tool, Advantages and Disadvantages, Operation of NC m/c tool system, Basic length unit, NC co-ordinates system, Motion control in NC, Classification of NC controls — CNC — operation, application and advantages ,DNC — components, functions and advantages and ACO and ACC adoptive control.	classroom teaching, demonstratio n, quiz, assignments, tutorial	Teacher will explain the contents and provide handouts to students. Teacher will conduct assignments/ quiz/tutorial to make students practice their knowledge.	8	NIL	Handouts, chalk board, PPT, text book, charts, video film.	

S. No	Method of Assessment	Description of Assessment	Maximum Marks	Resources Required	External / Internal						
1	Theory exam	Student will be asked to explain working of NC/CNC/DNC/adaptive control using block diagrams	15	Question paper	External						
	ADDITIONAL INSTRUCTIONS FOR THE HOD/ FACULTY (IF ANY)										

Part of end semester theory exam

RGPV (Diploma Wing ) Bhopal		SCHEME FOR LEARNING	Bran	ch C	Code		Cou	ırse Co	ode	CO Code	LO Code	Format No. 4
		OUTCOME	M	0	2	5		0	3	3	3	
COURSE NAME	Manufacturing Tech	Manufacturing Techniques and Systems										
CO Description	Write a part program	Write a part program for a given component.										
LO Description	ption Write a Part program using codes for preparatory and miscellaneous functions for a given component.											
	<u>'</u>											

#### **SCHEME OF STUDY**

S. No.	Learning Content	Teaching –Learning Method	Description of T-L Process	Teach Hrs.	Pract. /Tut Hrs.	LRs Required	Remarks
1	Part programming- program format, steps in CAPP, Code for preparatory and miscellaneous functions (G and M code), preparation of small part program, NC word, CANNED Cycle.	Interactive classroom teaching, demonstration, quiz, assignments, tutorial	Teacher will explain the contents and provide handouts to students. Teacher will conduct assignments/ quiz/tutorial to make students practice their knowledge.	2	4	Handouts, chalk board, PPT, text book, charts, video film and mentioned machines.	

# SCHEME OF ASSESSMENT

S. No.	Method of Assessment	Description of Assessment	Maximum Marks	Resources Required	External / Internal
1	Assignment	Student will be asked to write a Part program for a given component.	10	Observation schedule/check-list /rating scales /rubrics	Internal

# ADDITIONAL INSTRUCTIONS FOR THE HOD/ FACULTY (IF ANY)

Part of term work

RG	RGPV (Diploma Wing ) Bhopal		SCHEME FOI			anch C			ourse (		CO Code	LO Code	Format No. 4
	URSE ME	Manufacturing 7	Γechniques and Syste		M	0	2	5	0	3	3	4	
	cription	Write a part prog	ram for a given compo	nent.									
LO Des	cription	Run a given part p	rogram on a simulator or	a CNC machine to	ol.								
				SCHEME O	F STU	DY							
S. No.	Lear	ning Content	Teaching –Learning Method	Description of Process	T-L	Teach Hrs.	Pract. /Tut Hrs.  LRs Required				Remarks		
1	of a part p	ration of execution program on a n Software/CNC tool.	Interactive classroom teaching, demonstration, quiz, assignments, tutorial	Teacher will exp the contents and provide handouts students. Teache conduct assignm quiz/tutorial to n students practice knowledge.	s to r will ents/ nake	PPT, text book, charts, video film and mentioned machines.		·					
				SCHEME OF AS	SSESS	MENT							
S. No.	Metho	od of Assessment	Description of A	Assessment		imum arks			Resou	rces Re	quired		External / Internal
1		oratory test by observation	Student will be asked part program on a sin machine tool.	-		10	Observation schedule/check-list /rating scales /rubrics			ating	Internal		
			ADDITIONAL INST	RUCTIONS FOR	THE	HOD/	FAC	ULTY (	IF AN	<b>Y</b> )			
				Part of lal	work								

RG	RGPV (Diploma Wing ) Bhopal		SCHEME FOI		Br	anch Co	ode	Cours	urse Code		CO Code	LO Code	Format No. 4
	_ , (_ <b>p</b>	( · · <b>g</b> /• <b>F</b> ··-	OUTC	COME	M	0	2 5	5	0	3	4	1	
	URSE ME	Manufacturing '	Techniques and System	ms							1	1	
CO Des	cription	<b>Explain the Flexi</b>	ble Manufacturing Syste	ems, Robotics, CI	M, Ma	nufactu	ring, Arti	ficial	Intel	lligence	e and Ma	achine L	earning.
LO Des	cription	Describe FMS, Ro	botics using suitable diag	grams.									
				SCHEME O	F STU	DY							
S. No.	S. No. Learning Content		Teaching –Learning Method	Description of Process	T-L	Teach Hrs.	Pract /Tut Hi		L	Rs Rec	luired		Remarks
1	1 Flexible		Interactive classroom	Teacher will exp	lain	8	NIL	F	Hand	outs, ch	alk board	d,	
	Manufa	cturing	teaching,	the contents and				P	PT,	text boo	ok, charts	8,	

students. Teacher will

conduct assignments/

quiz/tutorial to make

students practice their

knowledge.

assignments,

tutorial

New

system,

and Non

criteria of

Limitations, Feature &

**Robotics**: Introduction to robotics, Law of robotics, Elements of

Industrial applications,

Characteristics,

development.

Robot

Industrial

selection Robot.

# SCHEME OF ASSESSMENT

S. No.	Method of Assessment	Description of Assessment	Maximum Marks	Resources Required	External / Internal
1	Theory exam	Student will be asked to describe given terms associated with FMS/Robotics using suitable diagrams.	10	Question Paper	External

#### ADDITIONAL INSTRUCTIONS FOR THE HOD/ FACULTY (IF ANY)

Part of end semester theory exam

RGPV (Diploma Wing ) Bhopal			Sellente i ok eenking		Branch Code Co				ode	Code	Code	Format No. 4	
NO.	1 v (Dipioina	vving / Dhopur	OUTC	COME	M	0	2	5	0	3	4	2	_ Tornac rvo.
	URSE M	anufacturing [	Γechniques and System	ms			'						
CO Des	cription Ex	xplain the Flexil	ble Manufacturing Systo	ems, Robotics, C	IM, M	anufactı	ıring, A	Artifici	ial Inte	lligenc	e and Ma	achine L	earning.
O Desc	cription De	escribe CIM, JIT	M and Lean manufacturi	ng.									
	'			SCHEME O	F STU	DY							
S. No.	Learnin	g Content	Teaching –Learning Method	Description of T-L Process		Teach Hrs.		ract. t Hrs.	I	Rs Re	quired		Remarks
1	Manufactu Concepts, benefits requirement Just I Manufactu concepts, Push vs	Elements, and basic at.  In Time uring: elements, Pull system, oncept, lean	Interactive classroom teaching, demonstration, quiz, assignments, Tutorial.	Teacher will exp the contents and provide handout students. Teacher conduct assignment quiz/tutorial to restudents practice knowledge.	es to er will nents/ nake	6	0		PPT,		halk board	·	
				SCHEME OF A	SSESS	MENT							
S. No.	Method o	of Assessment	Description of A	assessment		kimum arks		]	Resour	ces Re	quired		External / Internal
1	1 given terms associa Lean manufacturin		Student will be asked given terms associated Lean manufacturing diagram	ed CIM/JITM/ using suitable		5			Question Paper				External
			ADDITIONAL INST	RUCTIONS FOI	R THE	HOD/	FACUI	LTY (I	F ANY	7)			
			]	Part of end semest	ter thec	ry exam							

**Branch Code** 

CO

**Course Code** 

 $\mathbf{LO}$ 

RG	PV (Dinlo	oma Wing ) Bhopal	SCHEME FO		Br	anch Co	ode	Co	urse C	ode	CO Code	LO Code	Format No. 4
NO.	i v (Dipio	ma wing / Dilopai	OUTO	COME	M	0	2	5	0	3	4	3	1 01111111 110. 4
	JRSE ME	Manufacturing 7	Techniques and Syste	ms			I					ı	
CO Des	cription	<b>Explain the Flexil</b>	ble Manufacturing Syst	ems, Robotics, C	IM, Ma	anufactu	ring,	Artifici	al Inte	lligenc	e and Ma	chine L	earning.
LO Desc	cription	Explain Artificial l	Intelligence and Machine	Learning concept	ts.								
		1		SCHEME O	F STU	DY							
S. No.	Lear	ming Content	Teaching –Learning Method	Description of Process	T-L	Teach Hrs.		ract. t Hrs.	L	Rs Re	quired		Remarks
1	and Learnin of Intellige Vertical AI. In Machine Types Learnin between Intellige	AI, Horizontal ntroduction of Learning, of Machine g, Difference Artificial	Interactive classroom teaching, demonstration, quiz, assignments, Tutorial.	_		4	N	NIL	Handouts, chalk board, PPT, text book, charts, video film.			·	
				SCHEME OF A	SSESS	MENT							
S. No.	Metho	od of Assessment	Description of A	Assessment		arks		1	Resour	ces Re	quired		External / Internal
1	Paper pen test		Student will be ask given terms associa Intelligence / Machine suitable diag	ated Artificial e Learning using		5		Те	st pape	r + Rat	ing scale		Internal
			ADDITIONAL INST	RUCTIONS FO	R THE	HOD/ I	FACU	LTY (I	F ANY	7)			
				Part of progre	essive to	est-II							

RGPV (Diploma Wing ) Bhopal		SCHEME FOR LEARNING OUTCOME		Branch Code			ourse	Code	CO Code	LO Code	Format No. 4
				0	2	5	0	1	5	1	
COURSE NAME	Manufacturing Techniques and Systems										
CO Description	Explain a given Additive manufacturing method.										
LO Description	Describe a given Additive manufacturing method using diagrams.										
	·										

#### **SCHEME OF STUDY**

	SCHEME OF STUDY											
S. No.	Learning Content	Teaching –Learning Method	Description of T-L Process	Teach Hrs.	Pract. /Tut Hrs.	LRs Required	Remarks					
1	Introduction, Advantages, Limitations, Classifications, History	Interactive classroom teaching, demonstration, quiz, assignments,	Teacher will explain the contents and provide handouts to students. Teacher will	8	0	Handouts, chalk board, PPT, text book, charts, video film.						
	of 3DP, Need of 3D printing, 3DP technology steps, 3D	tutorial	conduct assignments/ quiz/tutorial to make students practice their knowledge.									
	printing application fields, Additive v/s											
	subtractive Manufacturing											
	processes, Examples of 3D Printing, Construction, Working											
	and Applications of - Fused Deposition											
	Modeling (FDM), Stereolithography											
	(STL), Selective Laser Sintering (SLS), Multi											
	Jet Fusion (MJF), Laminated object											
	Manufacturing(LOM). Additive											

	Manufacturing/3D printing Equipments: Process Equipment- Design and process parameters, Governing Bonding Mechanism, Process Design.	RGPV (Diploma	Wing ) Bhopal										
	SCHEME OF ASSESSMENT												
S. No.	Method of Assessment	Description of Assessment	Maximum Marks	Resources Required	External / Internal								
1	Theory exam	Student will be asked to describe a given Additive manufacturing method using diagrams.	20	Question Paper	External								
ADDITIONAL INSTRUCTIONS FOR THE HOD/ FACULTY (IF ANY)													
	Part of end semester theory exam												

RGPV (Diploma Wing ) Bhopal		SCHEME FOR LEARNING		Branch Code			Course Code				Code	Format No. 4
` 1	87	OUTCOME	M	0	2	5	0		3	5	2	
COURSE NAME	Manufacturing Techniques and Systems											
<b>CO Description</b>	Explain a given Additi	ve manufacturing method.										
LO Description	Prepare a STL file using	g given software for a given CAD mod	del of a	compo	nent.							
		SCHEME O	F STU	DY								

S. No.	Learning Content	Teaching –Learning Method	Description of T-L Process	Teach Hrs.	Pract. /Tut Hrs.	LRs Required	Remarks
1	Additive manufacturing process steps	Interactive classroom teaching, demonstration, quiz, assignments, Tutorial.	Teacher will explain the contents and provide handouts to students. Teacher will conduct assignments/ quiz/tutorial to make students practice their knowledge.	2	8	Handouts, chalk board, PPT, text book, charts, video film and System along with mentioned software.	

S. No.	Method of Assessment	Description of Assessment	Maximum Marks	Resources Required	External / Internal
1	Laboratory test by observation	Student will be asked to prepare a STL file using given software for a given CAD model of a component.	10	Configured System along with software	Internal

# ADDITIONAL INSTRUCTIONS FOR THE HOD/ FACULTY (IF ANY)

Part of lab work

RGPV (Diploma Wing ) Bhopal		SCHEME FOR LEARNING	B	Branch Code			C	our	rse C	ode	CO Code	LO Code	Format No. 4
		OUTCOME		0		2	5		0	3	5	3	
COURSE NAME	Manufacturing Tech	Manufacturing Techniques and Systems											
CO Description	Explain a given Additi	ve manufacturing method.											
LO Description	<b>Description</b> Prepare a given job using 3D printing machine or simulator.												
SCHEME OF STUDY													

S. No.	Learning Content	Teaching –Learning Method	Description of T-L Process	Teach Hrs.	Pract. /Tut Hrs.	LRs Required	Remarks
1	Demonstration of preparation of a job using 3D printing machine /simulator.	Interactive classroom teaching, demonstration, quiz, assignments, Tutorial.	Teacher will explain the contents and provide handouts to students. Teacher will conduct assignments/ quiz/tutorial to make students practice their knowledge.	2	8	Handouts, chalk board, PPT, text book, charts, video film and System along with mentioned software	

S. No.	Method of Assessment	Description of Assessment	Maximum Marks	Resources Required	External / Internal
1	Laboratory test by observation	Student will be asked to prepare a given job using 3D printing machine /simulator.	10	Configured System along with software and 3D printer/Simulator	External

# ADDITIONAL INSTRUCTIONS FOR THE HOD/ FACULTY (IF ANY)

Part of end semester practical exam

DIPLOMA IN MECHANICAL ENGINEERING

SEMESTER: FIFTH SEMESTER

SCHEME: OCBC COURSE CODE: 503

NAME OF THE COURSE: MANUFACTURING TECHNIQUES AND SYSTEMS

#### LIST OF SUGGESTED EXPERIMENTS

S.	LO	NAME OF EXPERIMENTS
NO.		
1	12	Prepare a job of given specifications along with safety precautions using a Lathe machine
2	12	Prepare a job of given specifications along with safety precautions using a Milling machine
3	12	Prepare a job of given specifications along with safety precautions using a Shaper machine
4	12	Prepare a job of given specifications along with safety precautions using a drilling machine
5	12	Prepare a job of given specifications along with safety precautions using a boring machine
7	12	Prepare a job of given specifications along with safety precautions using a grinding machine tool
8	22	Prepare a job of given specifications along with safety precautions using an EDM/ LBM/EBM/PAM machine tool
9	22	Prepare a job of given specifications along with safety precautions using ECM machine tool
10	22	Prepare a job of given specifications along with safety precautions using USM/AJM/WJM machine tool
11	34	Write and run a given part program on a simulator /CNC machine tool
12	52	Prepare a STL file for a given CAD model of a component. using given software
13	53	Prepare a given job using 3D printing machine