RGPV ((Diploma W	/ing) Bhopal		SCHEME	FOR LEARNING		Branc Code	h		Cour: Code	se	CO Co de	LO Co de	Format No. 4
				C	OUTCOME	0	0	1				1	1	
COURS	SE NAME	Laser, Applica	ation an	d Safety			_						1	
CO Des	scription	Explain the fund	ction of a	coherent light sou	rce									
LO Des	cription	Introduce Cohe	erent Lig	ht Source (Cognit	tive)									
		1			SCHEME OF STUDY									
S. No.	L	earning Content		Teaching – Learning Method	Description of T-L Process	Te H	each Irs.	Г /Т	Pract. ut Hrs	5.	LRs	Require	ed	Remarks
LO-01	Meaning c Review of power, int Energy lev Populatior	of LASER Optical spectrum, e rensity of light rels n inversion	energy,	Interactive classroom lecture, PPT, demonstration, quiz, assignments, tutorial	Teacher will explain the contents and provide handouts to students. Teacher will conduct quiz/assignments/ tutorial to make students practice their knowledge.		8			T H b P W le of	ext Boo andout bard, N roblem /orkboo cture- hers.	oks, PP s, chall lumeric s ok Vide NPTEL	T, al o and	
				S	CHEME OF ASSESSMENT					I			I	
S. No.	Method	of Assessment		Description	n of Assessment		M	aximu Mark	um Is	Res	ource	s Requ	ired	External / Internal
LO-01	Interna Prog	I- Assignment ressive	Studer 1. Wri 2. Wri 3. Def 4. Exp 5. Def	nt will be asked to (a te full form of Laser. te range of Optical S ine Optical Energy, F plain Energy levels of ine and Explain Popu	and/or): pectrum. Power and Intensity. atoms and molecules. ulation Inversion.			10		Qu	uestion ale	paper,	Rating	Internal- Theory
ADDITIC	NAL INST	RUCTIONS FOR TH	HE HOD/ I	FACULTY (IF ANY)			·							

RGPV (D	Diploma W	/ing) Bhopal	SCHEME F	OR LEARNING	Br Co	anch ode	Cours Code	e	CO Co de	LO Co de	Format No. 4
				DUTCOME	0	0 1			1	2	
COURS	E NAME	Laser, Applicati	ion and Safety				I		1	11	
CO Desc	cription	Explain the function	on of coherent light so	ource							
LO Desc	ription	Explain working	of Laser (Cognitive)								
		1		SCHEME OF STUDY							
S. No.	L	earning Content	Teaching – Learning Method	Description of T-L Pro	ocess	Teach Hrs.	Pract /Tut Hrs.	-	LRs R	equired	Remarks
LO-02	- Bas Act Re - Bas - Ra Abs stir - Pu and pur	sic components of I tive medium, Pump sonator sic Principle of Laser diative proce sorption, Spontaneous nulated emission mping methods: C d Electrical disc mping	Laser: Interactive o and classroom lecture, PPT, demonstration, esses: quiz, assignments, s and tutorial	Teacher will explain the of and provide handouts to students. Teacher will co quiz/assignments/ tutoria make students practice to knowledge.	Cher will explain the contents provide handouts to lents. Teacher will conduct /assignments/ tutorial to te students practice their wledge.10Text Books, PPT, Handouts, chalk board, Numerical Problems Workbook Video lecture- NPTEL and others.						
				SCHEME OF ASSESSME	NT						
S. No.	Method	of Assessment	Description	of Assessment	Max M	imum arks	Resc	ources	Requi	red	External / Internal
LO-02	End Se	mester Theory Exam	 Student will be asked to Draw Basis diagram components. Explain Principle of Explain three radiation Explain the need of Draw and explain O pumping method 	o (and/or): of a Laser showing basic Laser. ve processes. pumping in Laser system. ptical and Electrical discharge		10	Questior	ı paper	, Ratin	g scale	External- Theory
ADDITION	NAL INSTI	RUCTIONS FOR THE	E HOD/ FACULTY (IF AN)	()							

RGPV (I	Diploma W	Ving) Bhopal		SCHEME FOR	LEARNING		Bran Code	ch e		Cours Code	9	CO Co de	LO Co de	Format No. 4
				OUT	ГСОМЕ	0	0	1				1	3	
COURS	E NAME	Laser, Applicat	ion and S	afety			1	I			1			
CO Des	cription	Explain the function	on of cohe	erent light sour	ce									
LO Des	cription	Describe properti	es of Lase	er Radiation (Co	ognitive)									
					SCHEME OF STUDY									
S. No.	L	earning Content		Teaching – Learning Method	Description of T-L Pr	ocess		Teacł Hrs.		Pract /Tut Hrs.		LRs R	equired	d Remarks
LO-03 Meaning and specific use of the followings: - Divergence - Coherence - Monochromaticity and spectral width - Intensity - Focusing of Laser beam - Conser beam - Nonochromatic beam - N							S	9			T F O F V I e a	PPT, Ha PPT, Ha halk bo Numeric Problem Vorkboo ecture- and othe	oks, indouts ard, al s ok Vide NPTEL ers.	, o
				S	CHEME OF ASSESSME	NT								
S. No.	Method	l of Assessment		Description of	Assessment	M	axim Marl	um ks		Reso	urces	s Requi	red	External / Internal
LO-03	End Se	mester Theory Exam	Student w 1. Explai 2. Define 3. Distine source 4. Table applice 5. Explai	ill be asked to (an in four Properties e coherence of La guish between La e. properties of Lase cations.	nd/or): of Laser radiation. ser. user and Ordinary Light er and corresponding focusing of Laser beam.	1	0		Q	uestion	pape	r, Ratin	g scale	External- Theory
			ADI	DITIONAL INSTR	UCTIONS FOR THE HO	D/ FAC	ULTY	(IF Al	IY)					

RGPV (D)iploma W	ing) Bhopal		SCHEME		Branc	h Code	Cou Coo	irse le	CO Co de	LO Cod e	Format No. 4
				0	UICOME	0 0	1			1	4	
COURS	E NAME	Laser, Applicati	on ar	nd Safety								
CO Desc	ription	Explain the func	tion o	f coherent light sou	urce							
LO Desc	ription	Know general s	pecifi	cations of Laser(Co	ognitive)							
					SCHEME OF STUDY							
S. No.	L	earning Content		Teaching – Learning Method	Description of T-L Process	Teach Hrs.	Pract /Tut Hi	'S.	LRs	Require	d	Remarks
LO-04	- Dis pul: - List spe - List spe - Nee	tinguish between CV sed LASER general of crifications of Laser Sy general Ele crifications of Laser Sy ed of Cooling system	V and Optical stem ectrical stem	Interactive classroom lecture, PPT, demonstration, quiz, assignments, tutorial	Teacher will explain the contents and provide handouts to students. Teacher will conduct quiz/assignments/ tutorial to make students practice their knowledge.	9			Text Bo Handou board, N Problem Video le NPTEL a	oks, PP ts, chalk lumerica s Workl cture- and othe	T, al book ers.	
				S	CHEME OF ASSESSMENT			I			1	
S. No.	Method	of Assessment		Description	of Assessment	Ma	aximum Marks	R	esource	s Requi	red	External / Internal
LO-04	End Se	mester Theory Exam	Stud 1. 2. 3. 4. 5.	ent will be asked to(and Differentiate between CV Write three advantages Name three Optical spec Write three Electrical spec Explain need of cooling s	d/or): W and Pulsed Laser. of Pulsed Laser. cifications of Laser. ecifications of Laser system. system in a Laser.	1	0	G	uestion cale	oaper, R	ating	External-Theory
			1	ADDITIONAL INSTR	UCTIONS FOR THE HOD/ F	ACULTY (I	F ANY)					1

RGPV	(Diploma W	/ing) Bhopal	5	CHEME FOR L		Bra Co	anch de	(Cours Code	e	CO Co de	LO Co de	Format No. 4
COUR	SE NAME	Laser Annlic	ation and Safe		JOME	0					~	5	
CO De	scription	Demonstrate d	ifferent Laser sv	/stems									
LO De	scription	Demonstrate P	opular Gas Las	ers (Psvchon	notor)								
			•		SCHEME OF STUDY								
S. No.	Le	earning Content		Teaching – Learning Method	Description of T-L Proce	SS	Teach Hrs.	Pra /T H	act. ut rs.	LR	s Requ	ired	Remarks
LO-05	Classificatio - Sol Las Operation, specific app - He-t - CO ₂ Compare C Beam diver HeNe/Semi	on of Laser based of id state Laser, G ser, Semiconductor performance ch olication of: Ne Laser Laser O2 Laser and He-N gence measureme iconductor Laser	on active medium: Bas Laser, Liquid Laser aracteristics and Ne Laser nt of	Lab demonstratio n, hands on practice, Lab assignments	 Teacher will explain the content in class/lab. Teacher with support from lab staff will demonstrate procedure of lab experiments. Student will conduct lab assignment based on the experiments. 	n the se	-	9	Э	HeN Pow CO2 syste mete beno mou Pola gogg man	e Lase er supp em, I er, C ch nts, rizer, S gles, ual	r with oly, Laser Power Optical with Safety Lab	
	1			SC	HEME OF ASSESSMENT	I							
S. No.	Method	l of Assessment	Dese	cription of Asso	essment		Maximun Marks	1	Reso	ources	Requi	red	External / Internal
LO-05	Prac	tical test in poratory	 Student will be a Write name o Classify Lase Distinguish be Explain Lase method. Give typical be Laser. 	asked to (and/o f three gas Lase r on the basis of etween HeNe La r beam divergen eam divergence	or): ers. f active medium. aser and CO2 Laser. ace measurement e of HeNe and Semiconducto	15 r			Rubi	rics, Ra	ating S	cale	External- Practical
ADDITIC	ONAL INST	RUCTIONS FOR T	HE HOD/ FACUL	TY (IF ANY)									

		SCHEME FOR	LEARNING		Code	cn I	(Cours Code	e	Co de	Co de	Format No. 4
		OU [.]	TCOME	0	0	1				2	6	
NAME Laser, App	lication and S	Safety										
iption Demonstrat	different Lase	er systems										
iption Demonstrat	e Popular high	power Lasers	(Psychomotor)									
			SCHEME OF STUDY									
Learning Conte	nt	Teaching – Learning Method	Description of T-L Pro	cess		Teach Hrs.	Pr /1 F	act. ſut Irs.	LR	s Requ	iired	Remarks
peration, performance nd specific application o - Nd: YAG Laser - Fiber Laser compare Nd:YAG Laser	characteristics	Lab demonstration, hands on practice, Lab assignments	 Teacher will explain the in class/lab. Teacher with support f staff will demonstrate the procedure of lab experient. Student will conduct late assignment based on the experiments. 	e conte rom lab ne ments. o nese	nt	-		7	Nd:Y with supp Fibe Lase Powe Option with Safe Lab	AG Iy, r sy er r cal l mo ty go manua	Laser Power Laser vstem, meter, bench bunts, ggles, I	
		S	CHEME OF ASSESSME	IT								
Method of Assessme	t	Description of	Assessment	M	axim Mark	um s		Reso	ources	Requi	ired	External / Internal
Practical test in labora	Student v 1. Write proce 2. List a 3. List a 4. Comp 5. List t	vill be asked to (an e advantage of Fib essing. pplications of Nd: pplications of Fibe pare Nd:YAG and F hree specifications	nd/or): er Laser for material YAG Laser. er Laser. Fiber Laser for Cutting. s of Fiber Laser.		10		Rubri	cs, Ra	ating S	cale		Internal- Practical
	Laser, App ption Demonstrate ption Demons	Image: Case (Application and seption Demonstrate different Lase option Demonstrate Popular high Demonstrate Popular high Demonstrate Popular high Content Learning Content Deration, performance characteristics d specific application of: - Nd: YAG Laser - Fiber Laser ompare Nd: YAG Laser and Fiber Laser Method of Assessment Practical test in laboratory Practical test in laboratory Student w 1. Write proce 2. List a 3. List a 4. Comp 5. List the set option optioption optioption option option option option option op	Itematical Laser, Application and Safety ption Demonstrate different Laser systems ption Demonstrate Popular high power Lasers Learning Content Teaching – Learning Method peration, performance characteristics d specific application of: - Nd: YAG Laser - Fiber Laser Lab demonstration, hands on practice, Lab assignments Method of Assessment Description of Practical test in laboratory Student will be asked to(a 1. Write advantage of Fib processing. Practical test in laboratory Student will be asked to(a 1. Write advantage of Fib processing. Practical test in laboratory Student will be asked to(a 1. Write advantage of Fib processing. Practical test in laboratory Applications of Nd: 3. List applications of Fibe 4. Compare Nd:YAG and I 5. List three specification.	Demonstrate different Laser systems ption Demonstrate Popular high power Lasers (Psychomotor) SCHEME OF STUDY Learning Content Teaching Learning Method Description of T-L Program ption Description of T-L Program Description of T-L Program Description of T-L Program Description of T-L Program Description of T-L Program Description of: Nethod Optimical demonstration, hands on practice, Lab demonstrate of procedure of lab experients Student will demonstrate the procedure of lab experients. Student will conduct lat assignments Student will conduct lat assignment based on the experiments. Method of Assessment Description of Assessment Description of Assessment Practical test in laboratory Student will be asked to(and/or): 1. Write advantage of Fiber Laser. 2. List applications of Nd:YAG Laser. Practical test in laboratory Student will be asked to(and/or): 1. Write advantage of Fiber Laser for Cutting. 5. List applications of Fiber Laser. Compare Nd:YAG and Fiber Laser. 3. List applications of Fiber Laser. 3. List applications of Fiber Laser.	Laser, Application and safety ption Demonstrate different Laser systems ption Demonstrate Popular high power Lasers (Psychomotor) SCHEME OF STUDY Learning Content Teaching - Learning Method Description of T-L Process beration, performance characteristics d specific application of: - Nd: YAG Laser - Fiber Laser Lab demonstration, hands on practice, Lab assignments • Teacher will explain the conter in class/lab. • Teacher will support from lab staff will demonstrate the procedure of lab experiments. • Teacher will support from lab staff will demonstrate the procedure of lab experiments. Method of Assessment Description of Assessment M Practical test in laboratory Student will be asked to(and/or): 1. Write advantage of Fiber Laser for material processing. M Practical test in laboratory 2. List applications of Nd:YAG Laser. 3. List applications of Fiber Laser. 4. Compare Nd:YAG and Fiber Laser for Cutting. 5. List three specifications of Fiber Laser. 4. DDITIONAL INSTRUCTIONS FOR THE HOD/ FACI	Laser, Application and Safety ption Demonstrate different Laser systems ption Demonstrate Popular high power Lasers (Psychomotor) SCHEME OF STUDY Learning Content Teaching - Learning Method Description of T-L Process beration, performance d specific application of: - Nd: YAG Laser - Fiber Laser Lab demonstration, hands on practice, Lab assignments • Teacher will explain the content in class/lab. • Teacher will explain the content in class/lab. • Teacher will explain the content in class/lab. • Teacher will explain the content in class/lab. • Teacher will explain the content in class/lab. • Teacher will explain the content in class/lab. • Teacher will explain the content in class/lab. • Teacher will conduct lab assignments • Teacher will conduct lab assignment based on these experiments. • Student will conduct lab assignment based on these • Student will conduct lab assignment based on these • Practical test in laboratory 10 Practical test in laboratory 10 • List applications of Nd:YAG Laser. 10 • List applications of Fiber Laser. 10 • List applications of Fiber Laser. 10 • List applications of Fiber Laser. 10 • List three specifications of Fiber Laser.	Laser, Application and Salety ption Demonstrate different Laser systems ption Demonstrate Popular high power Lasers (Psychomotor) SCHEME OF STUDY Learning Content Teaching Learning Method Description of T-L Process Teach Hrs. veration, performance characteristics d specific application of: Lab demonstration, hands on practice, Lab demonstration, hands on practice, Lab assignments • Teacher will explain the content in class/lab. • Teacher with support from lab staff will demonstrate the procedure of lab experiments. • Student will conduct lab assignments • Fiber Laser Schements • Student will conduct lab assignments • Student will conduct lab assignments. • Student will be asked to (and/or): 10 Practical test in laboratory 2. List applications of Nd:YAG Laser. 10 10 Practical test in laboratory 2. List applications of Fiber Laser. 10 Vertex experiments. 5. List three specifications of Fiber Laser. 10 2. List applications of Fiber Laser. 2. List three specifications of Fiber Laser. 10	Laser, Application and Salety ption Demonstrate different Laser systems ption Demonstrate Popular high power Lasers (Psychomotor) SCHEME OF STUDY Learning Content Teaching Learning Method Description of T-L Process Teach Hrs. Pr. // // // // // // // // // // // // //	Laser, Application and Safety ption Demonstrate different Laser systems ption Demonstrate Popular high power Lasers (Psychomotor) SCHEME OF STUDY Learning Content Teaching demonstration of T-L Process Teach Hrs. Pract. Learning Content Teaching demonstration, Method Description of T-L Process Teach Hrs. //Tut Hrs. Option of T-L Process Teach Hrs. //Tut Hrs. Description of T-L Process Teach Hrs. //Tut Hrs. option of T-L Process Teach Int Support from Iab Isos for Dipractice, Lab - 7 - Nd: YAG Laser and Fiber Laser Lab - Teacher will explain the content in class/abb. - 7 SCudent will conduct lab assignments -Student will conduct lab - Student will conduct lab - Student will conduct lab - <t< td=""><td>Laser, Application and Salety ption Demonstrate different Laser systems ption Demonstrate Popular high power Lasers (Psychomotor) SCHEME OF STUDY Learning Content Teaching - Learning Method Description of T-L Process Teach Hrs. Pract. /Tut Hrs. LR: operation, performance characteristics of specific application of: - Nd; YAG Laser - Fiber Laser Lab demonstration, hands on practice, Lab assignments • Teacher will explain the content in class/lab. - 7 Nd? With supp Fiber Lase • The character strice, Lab assignments • Teacher will explain the content in class/lab. - 7 Nd? With supp Fiber Lase • The character strice, Lab assignments • Teacher will explain the content in class/lab. - 7 Nd? With supp Fiber Lase • Student will be asked to assignment based on these experiments. • Student will conduct lab assignment based on these experiments. • Student will seased to (and/or): 10 Rubrics, Rating S Practical test in laboratory 2. List applications of Nd:YAG Laser. 10 Rubrics, Rating S 2. List applications of Md:YAG and Fiber Laser. 10 Rubrics, Rating S 2. List applications of Fiber Laser. 2. List three specifications of Fiber Laser. 10</td><td>Laser, Application and Safety ption Demonstrate different Laser systems ption Demonstrate Popular high power Lasers (Psychomotor) SCHEME OF STUDY SCHEME OF STUDY Learning Content Teaching Learning Method Description of T-L Process Teach Hrs. Pract. //Tut Hrs. Pract. LRs Require the specific application of: • Peration, performance characteristics Lab demonstration, hands on practice, Lab demonstration, hands on practice, Laser • Teacher will explain the content in class/lab. • Teacher will be astelf will conduct lab assignments. • Student will conduct lab assignments. • Student will conduct lab assignments. • Student will be asked to (and/or):</td><td>Laser, Application and safety prion Demonstrate different Laser systems prion Demonstrate Popular high power Lasers (Psychomotor) SCHEME OF STUDY Teaching - Learning Method Description of T-L Process Teach Hrs. Pract. /Tut Hrs. LRs Required vertation, performance characteristics d specific application of: - Nict YAG Laser Lab demonstration, practice, Lab assignments • Teacher will explain the content in class/lab. - 7 Nd: YAG Laser with Power supply. - Fiber Laser Lab damonstration, practice, Lab assignments • Teacher will explain the content in class/lab. - 7 Nd: YAG Laser with Power supply. - Fiber Laser Lab assignments • Teacher will conduct lab assignment based on these experiments. - 7 Nd: YAG Laser with mounts, Safety goggles, Lab manual Student will be asked to(and/or): 1 Write advantage of Fiber Laser for material processing. 10 Rubrics, Rating Scale 2 Practical test in laboratory 2. List applications of Nd:YAG Laser. 10 Rubrics, Rating Scale 2. List applications of Fiber Laser. 4. Lob article aser. 10 Rubrics, Rating Scale 2. List applications of Fiber Laser. 4. List applications of Fiber Laser. 10 Rubrics, R</td></t<>	Laser, Application and Salety ption Demonstrate different Laser systems ption Demonstrate Popular high power Lasers (Psychomotor) SCHEME OF STUDY Learning Content Teaching - Learning Method Description of T-L Process Teach Hrs. Pract. /Tut Hrs. LR: operation, performance characteristics of specific application of: - Nd; YAG Laser - Fiber Laser Lab demonstration, hands on practice, Lab assignments • Teacher will explain the content in class/lab. - 7 Nd? With supp Fiber Lase • The character strice, Lab assignments • Teacher will explain the content in class/lab. - 7 Nd? With supp Fiber Lase • The character strice, Lab assignments • Teacher will explain the content in class/lab. - 7 Nd? With supp Fiber Lase • Student will be asked to assignment based on these experiments. • Student will conduct lab assignment based on these experiments. • Student will seased to (and/or): 10 Rubrics, Rating S Practical test in laboratory 2. List applications of Nd:YAG Laser. 10 Rubrics, Rating S 2. List applications of Md:YAG and Fiber Laser. 10 Rubrics, Rating S 2. List applications of Fiber Laser. 2. List three specifications of Fiber Laser. 10	Laser, Application and Safety ption Demonstrate different Laser systems ption Demonstrate Popular high power Lasers (Psychomotor) SCHEME OF STUDY SCHEME OF STUDY Learning Content Teaching Learning Method Description of T-L Process Teach Hrs. Pract. //Tut Hrs. Pract. LRs Require the specific application of: • Peration, performance characteristics Lab demonstration, hands on practice, Lab demonstration, hands on practice, Laser • Teacher will explain the content in class/lab. • Teacher will be astelf will conduct lab assignments. • Student will conduct lab assignments. • Student will conduct lab assignments. • Student will be asked to (and/or):	Laser, Application and safety prion Demonstrate different Laser systems prion Demonstrate Popular high power Lasers (Psychomotor) SCHEME OF STUDY Teaching - Learning Method Description of T-L Process Teach Hrs. Pract. /Tut Hrs. LRs Required vertation, performance characteristics d specific application of: - Nict YAG Laser Lab demonstration, practice, Lab assignments • Teacher will explain the content in class/lab. - 7 Nd: YAG Laser with Power supply. - Fiber Laser Lab damonstration, practice, Lab assignments • Teacher will explain the content in class/lab. - 7 Nd: YAG Laser with Power supply. - Fiber Laser Lab assignments • Teacher will conduct lab assignment based on these experiments. - 7 Nd: YAG Laser with mounts, Safety goggles, Lab manual Student will be asked to(and/or): 1 Write advantage of Fiber Laser for material processing. 10 Rubrics, Rating Scale 2 Practical test in laboratory 2. List applications of Nd:YAG Laser. 10 Rubrics, Rating Scale 2. List applications of Fiber Laser. 4. Lob article aser. 10 Rubrics, Rating Scale 2. List applications of Fiber Laser. 4. List applications of Fiber Laser. 10 Rubrics, R

RGPV ((Diploma Wing) Bho	opal		SCHEME FOR	LEARNING OUTCOME	Bracco	anch de 0	1	C	ourse ode		CO Co de 2	LO Cod e	Format No. 4
COURS	SE NAME Laser	, Applicati	on and Sa	fety				_						
CO Des	scription Demor	nstrate diffe	erent Laser	systems										
LO Des	cription Descr	ibe the wor	king of Ser	miconductor La	aser (Cognitive)									
					SCHEME OF STUDY									
S. No.	Learning (Content		Teaching – Learning Method	Description of T-L Proc	ess	Te H	ach rs.		Pract. /Tut Hrs.		LRs Re	equirec	Remarks
LO-07	Semiconductor (Dio - Materials, B Wavelength - Structure - Basic Princi - Advantages - List Various Semiconduc	ode) Laser: Band gap and iple and Pum s of Semicond Applications ctor Laser	Interactive classroom lecture, PPT, demonstration , quiz, assignments, tutorial	Teacher will explain the co and provide handouts to st Teacher will conduct quiz/assignments/ tutorial students practice their kno	ntents udents. to make wledge.		9			T H P W le a	ext Boo andout oard, N roblem /orkboo ecture- nd othe	oks, PP s, chall umeric s ok Vide NPTEL ers.	T, al	
				S	SCHEME OF ASSESSMEN	Г								
S. No.	Method of Asses	ssment		Description of A	Assessment	Maxi Ma	imum arks			Resou	irces	Requir	ed	External / Internal
LO-07	End Semester Th	neory Exam	 Student wi 1. Explain 2. List the diode 3. Compared 4. Write 5. Explain 	II be asked to(an n working of Semi ree semiconducto Laser. are HeNe Laser wi three advantages n use of Semiconc	d/or): conductor Laser. ors with bandgaps to make ith Semiconductor Laser. of Diode Laser. ductor Laser for remote	10			Que	estion p	oaper,	Rating	scale	External- Theory
			sensin AD	g applications. DITIONAL INSTR	RUCTIONS FOR THE HOD/	FACULT	TY (IF	ANY)						

RGPV (I	Diploma V	/ing) Bhopal		SCHEME FOR	LEARNING	Bi	anch ode	C	ourse ode	•	CO Co de	LO Co de	Format No. 4
				OU	TCOME	0	0 1				3	8	
COURS	ENAME	Laser, Applicat	ion and S	afety			I						
CO Dese	cription	Use of high pow	er Laser fo	or various Indu	strial applications								
LO Desc	cription	Describe Materia	I Processi	ng Applications	s (Cognitive)								
		1			SCHEME OF STUDY								
S. No.	L	earning Content		Teaching – Learning Method	Description of T-L Proc	ess	Teach Hrs.		Pract. /Tut Hrs		LRs Ro	equired	Remarks
LO-08	- Ad Co - Las Ma - Be (Ty - Lis Ap	vantages, compa nventional methods sers choice and con iterial processing am transport vpical Setup) t Various Material plications	are with nparison for mechanism Processing	Interactive classroom lecture, PPT, demonstratio n, quiz, assignments, tutorial	Teacher will explain the contents and provide hand to students. Teacher will conduct quiz/assignments, tutorial to make students practice their knowledge.	douts /	9			T P C N P V Ie a	rext Boo PT, Ha halk bo lumeric Problem Vorkboo ecture- nd othe	oks, indouts ard, al s ok Vide NPTEL ers.	, 0
				S	CHEME OF ASSESSMEN	Г							
S. No.	Method	l of Assessment		Description of	Assessment	Max M	kimum arks		Resou	urces	Requi	red	External / Internal
LO-08	End Se	mester Theory Exam	Student w 1. Write Proce 2. Comp 3. Draw 4. List ba 5. Explain Nd:YA	vill be asked to (a five advantages essing. pare CO2 and Nd: Laser beam trans asic material proc in suitability of La AG, CO2 and Fiber	nd/or): of Laser Material YAG Laser for cutting. sport mechanism. cessing applications. users for cutting among r Lasers.	10		Que	estion	papei	r, Ratin	g scale	External- Theory
	1		ADI	DITIONAL INSTR	UCTIONS FOR THE HOD/	FACUL	TY (IF AN)	()					1

RGPV (Diploma Wing)	Bhopal		SCHEME FOR	LEARNING		Bra Cod	nch le			Cours Code	е	CO Co de	LO Co de	Format No. 4
				OU	ТСОМЕ	0		0	1				3	9	
COURS	SE NAME La	ser, Applicat	ion and s	Safety				1							1
CO Des	scription Us	e of high pow	er Laser	for various Indu	strial applications										
LO Des	cription Exp	olain Laser Cu	utting of N	letals and Non-	Metals (Cognitive)										
					SCHEME OF STUDY										
S. No.	Learn	ing Content		Teaching – Learning Method	Description of T-L Pro	cess		Te F	ach Irs.		Pract /Tut Hrs.	•	LRs R	equire	d Remarks
LO-09	Laser Cutting m - Melt an - Vaporiz - Scribing	Teacher will explain the c and provide handouts to students. Teacher will cor quiz/assignments/ tutorial make students practice th knowledge.	onten Iduct to eir	nts		9				Text Bo PPT, Ha chalk bo Numerio Problem Workbo lecture- and othe	oks, andouts bard, cal ns ok Vide NPTEI ers.	5, 90 -			
				S	CHEME OF ASSESSMEN	Т									
S. No.	Method of A	ssessment		Description of	Assessment	N	Maxin Maı	num rks	l		Resc	ource	s Requi	ired	External / Internal
LO-09	End Semest	er Theory Exam	Student v 1. Drav cutti 2. Desc 3. Expla 4. Give 5. Writ	will be asked to(a v a diagram to exp ng. cribe role of shield ain Vaporization La example of scribir e factors on which	nd/or): lain melt and Blow Laser Gas in metal cutting. aser cutting. ng cutting method. cutting speed depends.		1	0		Qu	estior	раре	er, Ratin	g scale	e External- Theory
	1		AC	DDITIONAL INSTR	UCTIONS FOR THE HOD	FAC	ULT	Y (IF	AN'	Y)					

RGPV (E)iploma W	/ing) Bhopal		SCHEME F	FOR LEARNING	Branc Code	h 1	C	ourse ode	CO Co de 3	LO Co de 10	Format No. 4
COURS	E NAME	Laser, Applicat	tion a	nd Safety								
CO Desc	cription	Use of high powe	er Lase	er for various Industri	al applications							
LO Desc	ription	Describe other I	Industi	rial Applications (Cog	nitive)							
		1			SCHEME OF STUDY							
S. No.	L	earning Content		Teaching – Learning Method	Description of T-L Process	Teach Hrs.	Prac /Tut H	ct. Hrs.	LR	s Require	ed	Remarks
LO-10	- Las - Las - Las	ser Welding ser engraving ser Surface hardening	9	Interactive classroom lecture, PPT, demonstration, quiz, assignments, tutorial	Teacher will explain the contents and provide handouts to students. Teacher will conduct quiz/assignments/ tutorial to make students practice their knowledge.	8			Text PPT, chalk Video NPTEI others	Book Handout boar lectur _ ar	s, s, d, e- nd	
			1	SC	HEME OF ASSESSMENT							
S. No.	Method	of Assessment		Description of	of Assessment	Ma	aximum Marks		Resourc	es Requ	ired	External / Internal
LO-10	Inter As Pro	nal – signment & / ogressive	Stud 1. C 2. W 3. D 4. E st 5. E	ent will be asked to (and ompare CW and Pulsed I /rite five advantages of La raw setup for Laser engra xplain phase transformati reel. xplain advantages of Las	d/or): Laser for Welding. aser Welding. aving. ion surface hardening of Ca er surface hardening.	arbon	10	Qu	uestion p	aper, Ra	ting	Internal- Theory
				ADDITIONAL INSTRU	ICTIONS FOR THE HOD/ F	FACULTY (IF ANY)	I				1

RGPV (Diploma W	/ing) Bhopal		SCHEME FOR	LEARNING	Br Cc	anch ode 0	1	Cou Code	se >	CO Co de 4	LO Co de	Format No. 4
COURS	E NAME	Laser, Applica	tion and S	Safety									
CO Des	cription	Use of Lasers for	or various s	services of hum	nan being								
LO Des	cription	Use Laser for m	netrological	applications (F	Psychomotor)								
		1			SCHEME OF STUDY								
S. No.	L	earning Content		Teaching – Learning Method	Description of T-L Proc	ess	Teac Hrs	:h 5.	Pra /Tu Hr:	ct. t	LRs R	equirec	d Remarks
LO-11Metrology Applications: - Optical alignment - Distance measurement - Diameter measurement - HolographyLab demonstration, hands on practice, Lab assignments• Teacher will explain the content in class/lab. • Teacher with support from lab staff will demonstrate the procedure of lab experiments. • Student will conduct lab assignment based on these experiments.• Metrology Applications: - 9							HeNe L Power r Optical bench mounts, Lenses holders, Hologra Lab mar	aser, neter, with and m, nual					
				S	CHEME OF ASSESSMEN	Г							
S. No.	Method	l of Assessment		Description of	Assessment	Max Ma	imum arks		Res	ource	es Requi	red	External / Internal
LO-11	Prac lab	tical test in poratory	Student v 1. List fiv 2. Write f 3. Draw a 4. Disting Photog 5. Setup	vill be asked to (a e metrology applic ive advantages of a setup for Constru- guish between Hol- graphy. for diameter meas	and/or): cations of Laser. Laser metrology. uction of Hologram. ography and surement using Laser.		15		Ru	brics, I	Rating S	cale	External- Practical
	,		AD	DITIONAL INSTR	UCTIONS FOR THE HOD/	FACUL	TY (IF A	NY)					I

RGPV (Diploma W	/ing)Bhopal		SCHEME FOR	LEARNING		Branc Code	h		Cours Code	e	CO Co de	LO Co de	Format No. 4
				OUT	ГСОМЕ	0	0	1				4	12	
COURS	SE NAME	Laser, Applica	ation and S	Safety									I	1
CO Des	cription	Use of Lasers f	or various	services of hum	nan being									
LO Des	cription	Know various m	nedical app	lications of Las	er (Cognitive)									
		1			SCHEME OF STUDY	,								
S. No.	L	earning Content		Teaching – Learning Method	Description of T-L P	Process		Гeach Hrs.		Pract /Tut Hrs	-	LRs R	equire	d Remarks
LO-12	Medical A	pplications: - Eye treatment - Laser surgery - Cancer treatmen - Dermatology	t	Interactive classroom lecture, PPT, demonstration, quiz, assignments, tutorial	Teacher will explain to contents and provide handouts to students Teacher will conduct quiz/assignments/ tu make students praction knowledge.	the b torial to ice their		8				Text B PPT, Handou chalk b Video lecture- NPTEL others	ooks, ts, board, and	
	-			S	CHEME OF ASSESSM	ENT			I		!			'
S. No.	Method	l of Assessment		Description of	Assessment	М	aximu Marks	m S		Reso	urce	s Requi	red	External / Internal
LO-12	Inter As Pro	nal – signment & / ogressive	 Student v 1. List fiv 2. Write t 3. Explain treatm 4. Descrii 5. Descrii 	vill be asked to (a e medical applicat hree advantages o n Laser application ents. be Laser application be Laser application	ind/or): ion of Laser. of Laser surgery. n for various eye on in dermatology. on in dermatology.		10		Ques	stion pa	aper,	Rating	scale	Internal- Theory
	·		AD	DITIONAL INSTR	UCTIONS FOR THE HO	DD/ FAC	JLTY (IF AN	IY)					·

RGPV (Diploma Wing) Bhopal COURSE NAME Laser, Application a				SCHEME FOR LEARNING OUTCOME			Branch Code		C	Course Code		CO Co de	LO Co de	Format No. 4	
			ion a				0		1			5 13		13	
CO Description Apply safety preca			cautions for the safe use of Lasers												
LO Description Describe the need			ed of safe practices (Cognitive)												
					SCHEME OF STUDY										
S. No.	. No. Learning Content			Teaching – Learning Method	Description of T-L Process	Teach Pract Hrs. /Tut Hr		ct. Hrs.	LRs Required			Remarks			
LO-13	 Hazards of Laser system Radiation Hazards Electrical Hazards Chemical and Fire Hazards Effect of Radiation on eyes and skin Safety levels/Classes 			Interactive classroom lecture, PPT, demonstration, quiz, assignments, tutorial	Teacher will explain the contents and provide handouts to students. Teacher will conduct quiz/assignments/ tutorial to make students practice their knowledge.	9					Text Books, PPT, Handouts, chalk board, Video lecture- NPTEL and others.				
				SC	CHEME OF ASSESSMENT										
S. No.	Method of Assessment			Description of Assessment			Ν	Maximum Marks			Resources Required			External / Internal	
LO-13	End Ser	mester Theory Exam	 Student will be asked to(and/or): 1. List three Hazards of Laser radiation. 2. Explain how Laser beam can be harmful to human and skin. 3. Describe the need of electrical safety while using L System. 4. Explain four safety classes of Laser system. 5. Categorized HNe and CO2 Laser safety class. 						10			Question paper, Rating scale			External-Theory
				ADDITIONAL INSTRU	JCTIONS FOR THE HOD/ F	ACI	ULTY	(IF	ANY)						

RGPV (Diploma Wing) Bhopal				SCHEME FOR LEARNING OUTCOME			Branch Code			Course Code		CO Co de	LO Co de	Format No. 4
							0	1				5	14	
COURSE NAME Laser, Applicati			tion and S	afety										
CO Description Apply safety pre		cautions fo	or the safe use	of Lasers										
LO Description Apply safe Pract			ices during high power laser applications (Psychomotor)											
		I			SCHEME OF STUDY									
S. No.	. No. Learning Content			Teaching – Learning Method	Description of T-L Proc	ess		Teac Hrs	h	Prac /Tu Hrs	: t. t	LRs Required		d Remarks
LO-14	LO-14 - Protection methods - Safety equipment - Safety precaution - Safety environment.			Lab demonstration, hands on practice, Lab assignments	 Teacher will explain the in class/lab. Teacher with support from staff will demonstrate the procedure of lab experiments. 	ent	-		7	7 Laser Safety Stickers, Goggles, protective wears, Optical bench, Lab manual				
				S	CHEME OF ASSESSMEN	Г								
S. No.	Method of Assessment			Description of Assessment			Maximum Marks			Resources Required				External / Internal
LO-14	Practica	al test in laboratory	Student w 1. Expla system 2. List fi Laser 3. Write 4. Descr Laser 5. Descr	vill be asked to (at in need of safety) m. ve safe practices v a name of three La tibe the choice of ibe the need of at	nd/or): precaution for a Laser while using high power aser safety equipments. goggles for a particular nti reflecting wall.	10 R			Rut	orics, F	ating	Internal- Practical		
			AD	DITIONAL INSTR	UCTIONS FOR THE HOD/	FAC	ULTY	(IF A	NY)					