## H.K.E. SOCIETY'S POOJYA DODDAPPA APPA COLLEGE OF ENGINEERING, GULBARGA Electronics and Instrumentation Engineering Branch (Applicable for 2019-20 admitted batch)

# SCHEME OF TEACHING AND EXAMINATION VIII SEMESTER

Code	Course		Maximum Marks							
No.		Lecture	Credits	CIE	SEE	Total				
	SEMESTER VIII									
	THEORY									
19EI81	Lasers and Optical	03	00	00	03	50	50	100		
	Instrumentation									
19EI82X	Elective - 4	03	00	00	03	50	50	100		
19EI8OEX	Open elective-3	03	00	00	03	50	50	100		
19EIMC84	Certification course	00	00	00	01					
19EI8P2	Project work - II	00	00	12	08	50	50	100		
19EIIN85	Internship	Completed during the	intervening vacations o	f VI and VII semester or	02	50		50		
			VII and VIII semester							
				TOTAL	20	250	200	450		

CIE - Continuous Internal Evaluation, SEE - Semester End Examination-

#### **ELECTIVE – 4**

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#### **OPEN ELECTIVE-3**

1 19EI8OE1 Optical Instrumentation

1	19EI821	Building Automation
2	19EI822	Power Plant Instrumentation
3	19EI823	Project Management

# Course Title: Lasers And Optical InstrumentationCourse Code19EI81CIE: 50Number of Lecture<br/>Hours/Week3 Hrs (Theory)SEE: 50Total Number of<br/>Lecture Hours: 42Credits: 03SEE<br/>Hours:03Prerequisite: Engineering Physics.Physics.SEE

# **Course Objectives**

1. Basics of lasers and their characteristics.

2. Different classes of lasers and their uses in optics and electronics.

3. Basics of fibers and their uses in optics.

4. Various properties of fibers.

5. The uses of fiber in communication and non-communication fields.

Modules	Teaching
	Hours
Module I	
Lasers I: Introduction, emission and absorption of radiation, population	
inversion, attainment of population inversion, optical feedback, pumping	
methods, threshold condition, laser losses, line shape functions, longitudinal	
and transverse modes of lasers.	
Classes of lasers: Principles, classification, construction and working of:	09 Hrs
Ruby, He-Ne, Nd-YAG, semiconductor, argon ion, carbon dioxide and dye	
lasers.	
Module II	
Lasers II: Characteristics of lasers: Introduction, single mode operation,	
frequency stabilization, mode locking, different types of mode locking, Q-	
switching, different types of Q-switching.	
Properties of laser light, brightness, line width, beam coherence.	
Optoelectronic devices and components: Photo diode, PIN diode, LEDs	09 Hrs
and photo transistors.	
Module III	
Laser Applications: Measurement of distance, interferometer, beam	
modulation telemetry, pulse echo techniques. Laser Doppler velocimetry,	
holography, applications of holography.	
Laser welding, micro welding, deep penetrating welding, machining, cutting,	
drilling etc. Applications of Lasers in Medicine: Surgery, dermatology,	08 Hrs
ophthalmology.	
Module IV	
Fiber Optics Wave Guide: Introduction, total internal reflection, numerical	
aperture, optical fiber wave guides, single mode fibers, graded index fiber,	
low dispersive fiber, fiber materials and manufacture.	
Fiber losses, fiber jointing & single fiber connectors multi fiber couplers.	08 Hrs
Module V	
Optical communication systems: Introduction, modulation schemes, analog	

modulatio	on, digita	al modulation. Example of integrated optics.								
Non con	nmunic	ation applications of fibers: Optical fiber sensors,								
multimod	le passiv	ve optical fiber sensors, multimode active optical fiber	<b>08 Hrs</b>							
sensors, p	hase mo	odulated sensors.								
Question	Paper	Pattern: Total 10 questions will be asked. Two from each mo	odule. The							
student ha	as to ans	wer five questions selecting at least one from each module.								
Text boo	ks:									
1. Optoel	lectronic	s - J. Wilson, & J.B. Hawkes, second edition, Prentice Ha	ll Europe,							
1998.	1998.									
2. Laser p	orinciple	s and applications - Wilson & Huwkes, PHI, 1987.								
Reference	e Books									
1. Essentials of optoelectronics with applications - A.J. Rogers.										
2.Principa	2.Principals optical communications & optoelectronics - Ravikumar, Bala N, Saraswati,									
Lak & Ho	omi.									
Course o	utcome	s:								
On comp	oletion o	f the course, the student will have the ability to:								
Course	CO #	Course Outcome (CO)								
Code										
19EI81	CO1	Compare different classes of lasers with their energy level di	agrams.							
	CO2	Differentiate various properties, characteristics of lasers.								
	CO3	Choose suitable lasers for engineering and medical fields.								
	<b>CO4</b>	Select different fibers for optical applications.								
	CO5	Apply suitable lasers for communication and non communication	ation							
		applications.								

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	2			1								2	2	1	
CO2	3			2								2	2	2	
CO3	2			2								2	3	2	
CO4	2			2								2	2	2	
CO5	3			1								2	1	3	

Cou	rse Title: Building Automation				
Course Code	19EI821	CIE: 50			
Number of Lecture Hours/Week	3 Hrs (Theory)	SEE: 50			
Total Number of Lecture Hours : 42	Credits: 03	SEE Hours:03			
Prerequisite: Transducers & Instrume	entation (16EI35), Process Control (16EI53)				
<ul> <li>Course Objectives</li> <li>1. To understand the principles and and 2. To understand the network of build systems)</li> <li>3. To interface building automation set 4. To understand control strategies for performance.</li> </ul>	pplication of building automation systems. lding automation (BA) and intelligent building auton ystem with building service systems. r better energy efficiency and building environment	nation (IB)			
	Modules	Teaching			
		Hours			
<b>Introduction</b> : Concept and applica Automation, requirements and dese efficiency of building automation s Alarm System Fundamentals: Wha Principles of Operation. FAS Comp their types, Fire control panels, Components, Panel Components, Architectures, Examples. FAS loops FAS Design procedure in brief, NFF alarm system, design aspects and com	tion of Building Management System (BMS) and sign considerations and its effect on functional ystem, architecture and components of BMS. Fire t is Fire? Fire modes, History, Components, and onents: Different fire sensors, smoke detectors and design considerations for the FA system. Field Applications. FAS Architectures: Types of : Classification of loops, Examples. Fire Standards: PA 72A, BS 5839, IS Concept of IP enabled fire & monents of PA system.	09 Hrs			
	Module II				
Access Control System: Access Control System: Access Components, Access control system Design. CCTV: Camera: Operation & types, Camera Selection Criteria, Camera Applications, DVR Based system, DVM, Network design, Storage design. Components of CCTV system like cameras, types of lenses, typical types of cables, controlling system.					
	Module III				
Security Systems: Security System Concepts. Perimeter Intrusion: Applications. Security Design: Security Des	is Fundamentals: Introduction to Security Systems, Concept, Components, Technology, Advanced ecurity system design for verticals. Concept of for safety, Physical security system with components, omponents, Computer system access control – DAC,	08 Hrs			

			M	odule	IV							
HVAC system Fundamentals, Psychometric C comfort zones Applications ( Ventilation Pre Unitary System components & Basics, Panel C Modbus, LON.	m: HVA Basic Pr Chart, Hea , Effect of I.e. Boild ocess & ms (VAV use, DD Componer	C system occesses at Trans of Heat, er, Hea Applicat 7, FCU C & ap tts Com	em Fund (Heating fer mech , Humidi ter), Coo tions (I.e etc). Co plications municatio	damer ,Coc anism ty, H oling e. Cen ontrol s. Cor on: Co	ntals: oling of s, Con eat lo Proce tral F Theo ntrol I mmur	Intro etc) E mpone oss. P ess & Fan S ory: I Panel: nicatio	duction Basic S ents. H rocesse Appl ystem, nstrum HVA on Basi	n to cience uman es: He lication AHU, nentation C Con cs, Net	HVAC : Air 1 Comfo ating I as (I.e. , Exha on Bas trol Pa tworks,	C, HV Propert Process Chill ust Fa ics, Fi nel, M , BACN	AC ies, nan & & er), ns), ield CC Net,	09 Hrs
			Μ	odule	V							
EnergyManaSavingsconcepBuilding(LEE)QuestionPape	agement ot &Meth D) Concej er Patterr	System: ods ,Lig ot & Exa n: Total	: ASHR ghting con amples 10 questi	AE S ntrol,	Symbo Build vill be	ols En ing E asked	nergy fficienc	Mana cy imp from e	gemen roveme each me	t: Ene ent, Gr	rgy een The stu	<b>08 Hrs</b> Ident has
to answer five of	questions	selecting	g at least	one fr	om ea	ch mo	dule.					
<ol> <li>Smart Buoks:</li> <li>Smart Build</li> <li>Process Cor</li> <li>Reference Boo</li> <li>Understandin</li> <li>Safety, Security</li> <li>Robert A. Di G</li> <li>Intelligent Bred, 2012.</li> <li>Design of S</li> <li>2<sup>nd</sup> edition,</li> <li>HVAC Con</li> <li>HVAC Con</li> <li>Course outcom</li> </ol>	ings - Jim <u>htrol Instru- ks:</u> g Buildin y, Access iandomer uilding Sy pecial Ha 2007. trols and S <u>trol in the</u> <b>hes:</b>	a Sinopo ument En g Autor Control nico, pub ystems - zards an Systems New M	li, Butter ngineers 1 mation S l, Lightin b. By R.S. Albert T ad Fire Al - Levenh illennium	worth Handb ystems g, Bui Mear Ting-P arm S agen, <u>n - Hon</u>	- Hein book - s (Dir lding hs Cor at So, ystem John rdeski	nemar Bela rect D Mana npany Wail ns - Ro I.Spet , Micl	in impr <u>G. Lipt</u> igital ( gemen , 1991) Lok Ch obert C hmann <u>nael F,</u>	int of I <u>ak, Ch</u> Contro t Progr an, Kl Gagnon - Dona <u>Fairmo</u>	Elsevie <u>ilton bo</u> l, Ener rams) - uwer <i>A</i> , Thom ald H., ont pres	r,2 <sup>nd</sup> ed <u>ook co.</u> gy Ma Reinh Academ ason De McGra <u>ass, 2001</u>	I., 2010 nagemo old A. nic pub elmar I nw-Hill 1.	). ent, Life Carlson, lisher,3 <sup>rd</sup> Learning; Pub.
On completion	n of the co	ourse, th	he studen	t will	have	the al	onlity to	0:				
19EI821	CO #	Analyz buildin	e Outcon ze current ig automa	ne (CC philos tion.	sophy	, tech	nology,	, termin	nology,	and pr	actices	used in
	CO2	Evalua	te differe	nt fire	stand	ards,	FAS C	ompon	ents, F	AS loo	ps,	
	~~~	Archite	ectures.			2						
	<u>CO3</u>	Demon	hordword	e conce	epts of	t secu	rity sys	stem.	~			
	C04 C05	Evalua	te energy	mana	geme	nt sys	tem.	<i>s</i> yster	11.			
PO1	PO2 PO3	PO4 P	PO5 PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1 3	$\frac{2}{2}$ 1								2	3		2
CO2 2 CO3 3	$\begin{array}{c c} 2 & 1 \\ \hline 2 & 2 \end{array}$								2	2		2
CO4 3	2 2								2	3		2
CO5 3	2 I								2	3		2

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	Course Title: Power Plant Instrumentation	
Course Code	19EI822	CIE: 50
Number of Lecture Hours/Week	3 Hrs (Theory)	SEE: 50
Total Number of Lecture Hours : 42	Credits: 03	SEE Hours:03
Prerequisite:		
Course Objectives 1. To acquire good kno 2. To acquire good kno 3. To know the basics of	wledge of power generation using various methods. wledge of Instrumentation involved in Power generation. of Turbine supervisory instrumentation and control. <b>Modules</b>	Teaching
	Madula I	Hours
<b>Overview of Power</b> plants, building blocks process, products of condensate systems, fe instrumentation in pow	Generation: Method of power generation in thermal power , Boiler types, feed water systems, steam circuits, combustion combustion process, fuel systems, treatment of flue gases, eed water conditioning, P&I diagram of boiler, importance of er generation.	08 Hrs
Measurement in boild system for pressure me Introduction to turbin measurement. Non-come the measurement of she	<b>Module II</b> er system: Metal temperature measurement in boilers, piping easuring devices, smoke and dust monitor, flame monitoring. ne supervising system, pedestal vibration, shaft vibration tact type of transducers for speed measurement and LVDT for cell expansion	08 Hrs
<b>Control Loops in Bo</b> control, boiler drum le steam temperature cor boiler following mode	Module III iler: Combustion control, air fuel ratio control, furnace draft vel control, three element drum level control, main and reheat trol, super-heater control, at temperature, de-aerator control, operation, turbine following mode operation.	08 Hrs
<b>Turbine, Monitoring</b> generator cooling sys pressure control	Module IV and Control: Lubricant oil temperature control, Hydrogen tem. Condenser vacuum control and gland steam exhaust	10 Hrs
<b>Power generation usin</b> generation in nuclear generation, power gene plan.	Module V ng other methods: Layout of hydroelectric power plant, power power plant, importance of control rods in nuclear power eration using solar and wind energy, and combined cycle power	08 Hrs
Question paper patter Total 10 questions will selecting at least one from	<b>n:</b> be asked. Two from each module. The student has to answer fix om each module.	ve questions

# **Text Books:**

# **Reference Books:**

1. Power plant Engineering - S.C. Aurora and Domkundwar , Dhanpat rai. 2. Power plant Engineering - Sravana Kumar, and Vijaya Ramanath, I.K.Intermational. Boiler control systems by David Lindsley, Mcgraw Hill.

Course outcor	nes:	
On completion	n of the	course, the student will have the ability to:
Course Code	<b>CO</b> #	Course Outcome (CO)
19EI822	CO1	Describe power generation using various methods and explain the working
		of thermal power plant in detail. Decode P & I diagrams for process control
		systems.
	CO2	Explain the techniques for measurement and control of four basic
		parameters like level, temperature, pressure and flow for power station as
		well as general process control systems.
	CO3	Describe the Instrumentation and control associated with boilers in TPP,
		and apply the knowledge gained for identifying and eliminating the
		redundancy in formulating the boiler control loops.
	CO4	Explain the prime mover supervision and control mechanism and describe
		the turbine supervisory instrumentation used in TPP.
	CO5	Explain the power generation using NPP, Hydroelectric, wind power and
		combined cycle power plant with its associated Instrumentation.

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	3	2		2								1	3		2
CO2	3	2			2							1	3		2
CO3	2	2		2								1	2		2
CO4	2	2										1	2		2
CO5	2	2										1	2		2

Course Title: Project Management         Course Code       19EI823         Number of Lecture Hours/Week       03 Hrs.(Theory)	CIE: 50 SEE: 50
Course Code19EI823Number of Lecture Hours/Week03 Hrs.(Theory)	CIE: 50 SEE: 50
Number of Lecture Hours/Week     03 Hrs.(Theory)	SEE: 50
Total Number of Lecture Hours: 42Credits: 03SI	SEE Hours:03
Prerequisite:	
<ul> <li>Course Objectives:</li> <li>1. To make them understand the concepts of Project Management for planning to execution</li> <li>2. To make them understand the feasibility analysis in Project Management and network and for cost and time estimation.</li> <li>3. To enable them to comprehend the fundamentals of Contract Administration, Costing and</li> <li>4. Budgeting. Make them capable to analyze, apply and appreciate contemporary project matools and methodologies.</li> </ul>	n of projects. malysis tools nd nanagement
Modules	Teaching Hours
<ul> <li>Defining skills every good project management:</li> <li>Defining skills every good project manager needs, understanding organizational structures, understanding project life cycles and project management process, the project management knowledge areas.</li> <li>Creating the project character and preliminary scope statement:</li> <li>Project needs and demands, project character, using Tools and techniques for character development, formalizing and publishing the project character, developing a planning preliminary project scope statement it.</li> <li>Developing the project scope statement:</li> <li>Developing the project management plan, scoping out the project, formulating scope definition, writing the project scope statement.</li> </ul>	08 Hrs
Module II         It creating the WBS and communicating the plan:         Creating the work breakdown structure, communicating the plan, identifying quality standards.         Risk planning:         Planning for Risks, identifying potential risk, analysing risks using qualitative techniques, quantifying risk, developing a risk response plan.         Resource planning.         Understanding purchase and acquisitions, plan contracting, human resource planning, defining activity definition, understanding the activities sequence process.         Module III         Creating the project schedule and budget:         Activity resource estimating, estimating activity durations, developing the project schedule, cost estimating, establishing the cost budget baseline.	08 Hrs

Executing the project plan, acquiring the project team, developing the project team, distributing project information																	
distrib	uting	proje	ct info	rmati	on.										08	B Hrs	
						Μ	[odul	e IV									
Measu	ıring	and o	contro	lling	proje	ect pe	rforn	nance	:								
Reque	sting	seller	respo	nses,	selec	ting s	ellers	, eval	uatior	n crite	eria, to	ols and	ł techn	iques			
of sel	ect s	ellers,	, selea	ct sel	lers	outpu	t, lay	ving o	out Q	uality	/ Assu	irance	procee	dures,			
monito	oring	and o	contro	l pro	ject v	vork,	admi	nister	ing tł	ne co	ntract,	manag	ging p	roject	10	) Hrs	
teams. Managing stakeholders. Establishing performance measurements.																	
Monit	oring	and	contro	olling	chan	ige:											
Manag	ging	integi	ated	chan	ge co	ontrol	. Ma	nagin	g co	st ch	anges.	Mon	itoring	and			
contro	lling s	sched	ule cha	anges	. Mor	nitorin	ig and	conti	olling	g risk.	U		U				
	U			0		Ν	Iodul	e V	L								
Controlling work results and closing out the project:																	
Utilizing perform quality control techniques. Verifying project scope Controlling												olling					
scope	chang	es Fo	ormula	ating	projec	rt clos	seout	Closi	ng ou	it the	project	Cont	ract clo	osure			
Releas	ing n	niect	team	meml	projet			01000			project	. com		, , , , , , , , , , , , , , , , , , ,			
Profes	siona	l resi	onsih	ilitie	5015. 2•										30	8 Hrs	
Fnsuri	ng int	earity	$\Delta nn$	lving	nrofe	ection	al kno	wled	ae Re	alanci	na stal	kehold	ers inte	recto			
Respec	cting a	differ	ences	in div	erse o	culture	25.	) w ieu	ge. D		ing sta	Kentolu		10313.			
Quest	ion pa	aper	patter	n:													
Total 10 questions will be asked. Two from each module. The student has to answer five questions									ns								
selecting at least one from each module																	
Text Books:																	
1. Project Management Professional study Guide 3rd edition - Kim Heldman Wiley nublishing Inc. 2005 ISRN-										N-							
13:978	-0-782	21-360	)1-X.	01000		cara j	s ar a c					,	ej paoi				
Refere	ence I	Books	5:														
1. Plar	nning,	Anal	lysis -	Prasa	anna (	Chand	lra. (2	(015)	Projec	cts-, S	Selectio	on, Fin	ancing	, Imple	ementa	tion a	nd
Rev	view, '	VI Ed	lition.	Tata I	Mc G	raw E	lill.		·				-	-			
2. Pro	ject N	lanag	ement	-Cha	udha	ry S. (	2016	)., 39t	h Rep	orint. '	Tata M	c Grav	v Hill.				
Cours	e out	come	s:														
On co	mplet	tion o	f the o	cours	e, the	stud	ent w	ill ha	ve the	abili a	ty to:						
Cours	e	C	0#	Co	urse (	Outco	me (	C <b>O</b> )			J.						
Code							(	,									
19EI82	23	C	01	De	scribe	e a pro	ject l	ife cy	cle, ar	nd car	ı skillf	ully ma	ap each	n stage	in the	cycle	
		C	02	Ide	ntifv	the re	sourc	es nec	eded f	or ead	ch stag	e. inclu	ıding iı	nvolve	d stake	holder	rs.
tools and supplementary materials											,						
<b>CO3</b> Describe the time needed to successfully complete a project, consideri										ing							
	factors such as task dependencies and task lengths											0					
CO4 Manages project risk, including identifying, analyzing and respondir											onding	g to ris	sk				
<b>CO5</b> Analyzes and manages stakeholder expectations and Strategical											lly apr	olies					
project management practices to ensure a successful project out										tcome	ina						
variety of organizations.																	
L		<b>I</b>															
		PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3	1
	CO1										1	3	2			3	4

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1										1	3	2			3
CO2										1	3	2			3
CO3									1			3			3
CO4												3			3
CO5									1	1		3			3

	Course Title: Optical Instrumentation							
Course Code	19EI8OE1	CIE: 50						
Number of Lecture Hours/Week	Number of Lecture     03 Hrs.(Theory)       Hours/Week							
Total Number of Lecture Hours: 42Credits: 03								
Prerequisite: None								
Course Objectives								
Modules								
	Module I							
Introduction to Laser (	Lasers -I): Introduction, Emission and absorption of radiation,							
Einstein relation, popula	tion inversion, optical feedback, threshold conditions, Line							
shape function, populati	on inversion and pumping threshold conditions.							
Classes of Laser: Doped insulator Lasers, semiconductor Lasers, Gas Lasers, Liquid								
dye Lasers. (Textbook-1	)							
	Module II							
Lasers-II: Single mode	operation, frequency stabilization, Mode locking and Q-							
switching.								
Applications of Laser: Measurement of distance: Interferometric methods, Beam								
modulation telemetry; H	olography & Holography interferometry. (Textbook-1)							
	Module III							
<b>Optical Fiber Commun</b>	nications: Motivations for light wave communications, optical							
spectral bands, Network	information rates, WDM concepts, Key elements of optical							
fiber systems, standards	for optical fiber communications, Modeling and simulation	08 Hrs						
tools.								
Optical Fibers: Structure	es, Wave guiding, and Fabrication: The nature of light, basic							
optical laws and definition	ons, optical fiber modes and configurations. (Textbook-2)							
	Module IV							
Types of Fibers, Mater	ial and Fabrication: Single mode fibers, Graded index fiber							
structure, Fiber material	s, Photonic crystal fibers, Fiber fabrication, Fiber optic cables.							
<b>Optical Amplifiers:</b> Ty	pes of optical amplifiers and its applications, Semiconductor	10 Hrs						
optical amplifiers, Erbiu	m-doped fiber amplifiers, Amplifier noise, Optical SNR,							
System, Raman amplifie	ers. (Textbook-2)							
	Module V							
Applications of Lasers	in Medicine: Fiber-optic laser systems in cardiovascular							
disease-Endoscopic lase	r systems in cardiology, Fiber-optic laser therapy-angioplasty,	08 Hrs						
Endoscopic Nd-YAG La	aser therapy in gastroenterology, Laparoscopic laser surgery,							
ophthalmological applic	ations of laser-fiber systems, arthroscopic surgery in							
orthopedics, laser lithotr	ipsy. (Textbook-3)							

## **Question paper pattern:**

Total 10 questions will be asked. Two from each module. The student has to answer five questions selecting at least one from each module.

## **Text Books:**

- 1. Optoelectronics- An Introduction-Wilson & Hawkes, Prentice Hall of India.
- 2. Optical fiber communications- GeirdKeser, McGraw Hill education (India) private limited, Fifth edition.
- 3. Lasers and Optical Fibers in Medicine Abraham Katzir, Academic Press, 1998.

## **Reference Books:**

- 1. LASER Fundamentals- William T. Silfvast, Cambridge University Press.
- 2. Essentials of Opto Electronics with Applications A.J. Rogers, CRC press 1997.

### **Course outcomes:**

#### On completion of the course, the student will have the ability to:

<b>Course Code</b>	CO #	Course Outcome (CO)
19EI8OE1	CO1	Explain the principle and working of Laser system.
	CO2	Discuss the engineering applications of laser systems.
	CO3	Discuss the fundamentals of optical fiber communications.
	<b>CO4</b>	Evaluate the design of optical fibers.
	CO5	Apply fiber optic laser systems in medical field.

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	2			1								2	2	1	
CO2	3			2								2	2	2	
CO3	2			2								2	3	2	
CO4	2			2								2	2	2	
CO5	3			1								2	1	3	

		Course Title: Project Phase - II							
Course Code		19EI8P2	CIE: 100						
Number of Prace	tical	12 Urs (Drootical) SEE							
Hours/Week		12 Hrs (Practical) SEE: 10							
		Credits: 08	SEE						
Comme Ohio di			Hours:03						
Lourse Objecti	ves								
1. To apply acqu	iired en	gineering skills in developing a selected project.							
2. To work as a team member in developing the selected project.									
3. To communicate effectively in written and oral presentation.									
Course outcom	es:								
On completion	of the c	course, the student will have the ability to:							
Course Code	CO #	Course Outcome (CO)							
19EI8P2	CO1	Perform self-study and exhibit the skills of self learning by d	lemonstrating						
		knowledge on the topic selected for project work.							
	CO2	Work as an individual or as a team member in addressing	g engineering						
		problem or build an engineering project.							
	CO3	Apply the acquired engineering skills to develop a prototype	or simulate a						
model for environmental, societal issues or engineering needs									
<b>CO4</b> Demonstrate the skill of collection of data and interpretation									
		effective decision making.							
	CO5	Communicate technical results, information and conclusions	to others by						
		means of formal presentations, drawings and reports.							

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	3											3	3		
CO2									3		3				
CO3	3	3	3		2	2	2					3	3	3	3
CO4				3	2										
CO5					1					3					

Course Title: Internship									
Course Code	19EIIN85	CIE: 50							
	12 Hrs (Practical)								
	Credits: 02								