

RGPV (Diploma Wing) Bhopal		SCHEME FOR LEARNING OUTCOME			Branch Code		Course Code		CO Code	LO Code	Format No. 4
					0	0	1		1	1	
COURSE NAME	Optical Communication System										
CO Description	Explain Fiber optic Communication System										
LO Description	Explain setup of Optical Communication system (Cognitive)										
SCHEME OF STUDY											
S. No.	Learning Content	Teaching – Learning Method	Description of T-L Process	Teach Hrs.	Pract. /Tut Hrs.	LRs Required			Remarks		
LO-01	Introduction to optical communication system Advantages of Optical Fiber Communication over coaxial cable, microwave link and other conventional communication systems Optical fiber communication windows Generation of optical fiber Communication Block Diagram study of Optical transmitter and optical receivers for: – Analog communication system – Digital communication system	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.	10	--	Text Books, PPT, Handouts, chalk board, Numerical Problems Workbook Video lecture- NPTEL and others.					
SCHEME OF ASSESSMENT											
S. No.	Method of Assessment	Description of Assessment			Maximum Marks	Resources Required			External / Internal		
LO-01	External- End Semester Exam	Student will be asked to (and/or): 1. Draw a basic block diagram of OFC system and explain. 2. Write four advantages of OF communication. 3. Describe three windows of OFC. 4. Compare generations of OFC. 5. Draw block diagram of digital fiber optic Tx and Rx.			10	Question paper, Rating scale			External-Theory		
ADDITIONAL INSTRUCTIONS FOR THE HOD/ FACULTY (IF ANY)											

RGPV (Diploma Wing) Bhopal		SCHEME FOR LEARNING		Branch Code			Course Code			CO Code	LO Code	Format No. 4
		OUTCOME		0	0	1				1	2	
COURSE NAME		Optical Communication System										
CO Description		Explain Fiber optic Communication System										
LO Description		Demonstrate long haul fiber optic Digital link design parameters (Cognitive)										
SCHEME OF STUDY												
S. No.	Learning Content	Teaching – Learning Method	Description of T-L Process	Teach Hrs.	Pract. /Tut Hrs.	LRs Required	Remarks					
LO-02	<ul style="list-style-type: none"> – Regenerative repeater – Repeater spacing – Factors affecting repeater spacing – Power budgeting – Optical and Electrical Bandwidth - Rise time (Bandwidth) budgeting 	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, Numerical Problems Workbook Video lecture- NPTEL and others.						
SCHEME OF ASSESSMENT												
S. No.	Method of Assessment	Description of Assessment			Maximum Marks	Resources Required			External / Internal			
LO-02	End Semester Theory Exam	Student will be asked to (and/or): <ol style="list-style-type: none"> 1. Describe the need of repeater in OFC. 2. Define repeater spacing and explain factors on which it depends. 3. Table power budgeting parameters. 4. Explain effect of dispersion on repeater spacing. 5. Draw block diagram of regenerative repeater. 			10	Question paper, Rating scale			External-Theory			
ADDITIONAL INSTRUCTIONS FOR THE HOD/ FACULTY (IF ANY)												

RGPV (Diploma Wing) Bhopal		SCHEME FOR LEARNING		Branch Code			Course Code			CO Code	LO Code	Format No. 4
		OUTCOME		0	0	1				1	3	
COURSE NAME	Optical Communication System											
CO Description	Explain Fiber optic Communication System											
LO Description	Setup fiber optic communication link (Psychomotor)											
SCHEME OF STUDY												
S. No.	Learning Content		Teaching – Learning Method	Description of T-L Process	Teach Hrs.	Pract. /Tut Hrs.	LRs Required			Remarks		
LO-03	<ul style="list-style-type: none"> - Audio communication through optical fiber. - Video communication through optical fiber. - Digital communication through optical fiber. - Study of computer interfacing through optical fiber. - Study of telephone interfacing through optical fiber. - Set up for Eye pattern Analysis 		Lab demonstration, hands on practice, Lab assignments	<ul style="list-style-type: none"> ● 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. 	-	9	Fiber optic trainer kit, CRO, Function generator, PRBS Generator, Microphone, Loud speaker, Computer, Lab manual					
SCHEME OF ASSESSMENT												
S. No.	Method of Assessment	Description of Assessment			Maximum Marks	Resources Required			External / Internal			
LO-03	Practical test in laboratory	Student will be asked to (and/or): <ol style="list-style-type: none"> 1. Setup a fiber optic analog link. 2. Setup a fiber optic Digital link. 3. Distinguish between analog and digital communication. 4. Setup Eye pattern and explain jitter. 5. Establish Fiber Optic Voice link. 			15	Rubrics, Rating Scale			External-Practical			
ADDITIONAL INSTRUCTIONS FOR THE HOD/ FACULTY (IF ANY)												

RGPV (Diploma Wing) Bhopal		SCHEME FOR LEARNING OUTCOME			Branch Code			Course Code		CO Code	LO Code	Format No. 4
					0	0	1			2	4	
COURSE NAME		Optical Communication System										
CO Description		Describe Advance Optical Communication Technologies										
LO Description		Describe need of Optical multiplexing technique (Cognitive)										
SCHEME OF STUDY												
S. No.	Learning Content	Teaching – Learning Method	Description of T-L Process	Teach Hrs.	Pract. /Tut Hrs.	LRs Required			Remarks			
LO-04	Wavelength division multiplexing (WDM) and Demultiplexing: <ul style="list-style-type: none"> – Introduction to WDM technology – Advantages of WDM – Distinguish between WDM and DWDM – Block diagram of WDM Techniques – Schematic diagrams of various WDM demultiplexing techniques 	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, Numerical Problems Workbook Video lecture- NPTEL and others.						
SCHEME OF ASSESSMENT												
S. No.	Method of Assessment	Description of Assessment			Maximum Marks	Resources Required			External / Internal			
LO-04	End Semester Theory Exam	Student will be asked to (and/or): <ol style="list-style-type: none"> 1. Write full form of WDM. 2. Explain need and advantages of WDM. 3. Draw block diagram of WDM multiplexing Tx. 4. Differentiate WDM and DWDM. 5. Explain WDM demux (grating type). 			10	Question paper, Rating scale			External-Theory			
ADDITIONAL INSTRUCTIONS FOR THE HOD/ FACULTY (IF ANY)												

RGPV (Diploma Wing) Bhopal		SCHEME FOR LEARNING			Branch Code		Course Code		CO Code	LO Code	Format No. 4
		OUTCOME			0	0	1			2	
COURSE NAME		Optical Communication System									
CO Description		Describe Advance Optical Communication Technologies									
LO Description		Describe Performance of Optical Amplifier (Cognitive)									
SCHEME OF STUDY											
S. No.	Learning Content	Teaching – Learning Method	Description of T-L Process	Teach Hrs.	Pract. /Tut Hrs.	LRs Required		Remarks			
LO-05	Erbium Doped Fiber Amplifier (EDFA) <ul style="list-style-type: none"> – Block diagram and Working principle – Wavelength of operation – Advantages as compared to regenerative repeater 	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 NPTEL others	Books, Handouts, board, lecture- and				
SCHEME OF ASSESSMENT											
S. No.	Method of Assessment	Description of Assessment			Maximum Marks	Resources Required		External / Internal			
LO-05	Internal – Assignment & / Progressive	Student will be asked to (and/or): <ol style="list-style-type: none"> 1. Compare EDFA with Electrical repeater. 2. Draw and explain principle of EDFA. 3. Explain pumping in EDFA. 4. Write advantage of EDFA. 5. Describe applications of EDFA. 			10	Question paper, Rating scale		Internal-Theory			
ADDITIONAL INSTRUCTIONS FOR THE HOD/ FACULTY (IF ANY)											

RGPV (Diploma Wing) Bhopal		SCHEME FOR LEARNING		Branch Code			Course Code			CO Code	LO Code	Format No. 4
		OUTCOME		0	0	1				3	6	
COURSE NAME	Optical Communication System											
CO Description	Demonstrate fiber interconnecting system											
LO Description	Appreciate importance of fiber interconnecting devices (Cognitive)											
SCHEME OF STUDY												
S. No.	Learning Content	Teaching – Learning Method	Description of T-L Process	Teach Hrs.	Pract. /Tut Hrs.	LRs Required	Remarks					
LO-06	<ul style="list-style-type: none"> - Need of connectors and splice - Comparison between connector and splice - Connector/Splice losses - Misalignment Losses: <ul style="list-style-type: none"> - Lateral misalignment - End separation - Angular misalignment 	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, Numerical Problems Workbook Video lecture- NPTEL and others.						
SCHEME OF ASSESSMENT												
S. No.	Method of Assessment	Description of Assessment			Maximum Marks	Resources Required			External / Internal			
LO-06	End Semester Theory Exam	Student will be asked to (and/or): <ol style="list-style-type: none"> 1. Differentiate between connector and Splice. 2. Explain advantages of splice as compared to connector. 3. Write acceptable values of connector and splice loss. 4. Explain reasons of splice loss. 5. Describe need of connector and splice. 			10	Question paper, Rating scale			External-Theory			
ADDITIONAL INSTRUCTIONS FOR THE HOD/ FACULTY (IF ANY)												

RGPV (Diploma Wing) Bhopal		SCHEME FOR LEARNING OUTCOME			Branch Code		Course Code		CO Code	LO Code	Format No. 4
					0	0	1			3	
COURSE NAME	Optical Communication System										
CO Description	Demonstrate fiber interconnecting system										
LO Description	Identify useful fiber connectors (Psychomotor)										
SCHEME OF STUDY											
S. No.	Learning Content	Teaching – Learning Method	Description of T-L Process	Teach Hrs.	Pract. /Tut Hrs.	LRs Required	Remarks				
LO-07	Types of connectors: Identification, features and Comparison of: - ST - SMA - LC - SC connector	Lab demonstration, hands on practice, Lab assignments	<ul style="list-style-type: none"> ● 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. 	-	7	Varipus fiber optic connectors, Lab manual					
SCHEME OF ASSESSMENT											
S. No.	Method of Assessment	Description of Assessment			Maximum Marks	Resources Required			External / Internal		
LO-07	Practical test in laboratory	Student will be asked to (and/or): 1. List five popular fiber optic connectors. 2. Compare SC and LC connector. 3. Identify various fiber connectors. 4. Write features of ST connector. 5. Write three specifications of connectors.			10	Rubrics, Rating Scale			Internal-Practical		
ADDITIONAL INSTRUCTIONS FOR THE HOD/ FACULTY (IF ANY)											

RGPV (Diploma Wing) Bhopal		SCHEME FOR LEARNING		Branch Code			Course Code			CO Code	LO Code	Format No. 4
		OUTCOME		0	0	1				3	8	
COURSE NAME		Optical Communication System										
CO Description		Demonstrate fiber interconnecting system										
LO Description		Know specifications of fiber optic coupler (Cognitive)										
SCHEME OF STUDY												
S. No.	Learning Content	Teaching – Learning Method	Description of T-L Process	Teach Hrs.	Pract. /Tut Hrs.	LRs Required	Remarks					
LO-08	<ul style="list-style-type: none"> - Introduction, need and coupler applications - Basic coupler parameters: <ul style="list-style-type: none"> a) Excess loss/Insertion Loss b) Coupling Ratio c) Directivity - Types of couplers - Star coupler - 3-dB Coupler - Applications of specific couplers 	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 Books, PPT, Handouts, chalk board, Numerical Problems Workbook Video lecture- NPTEL and others.						
SCHEME OF ASSESSMENT												
S. No.	Method of Assessment	Description of Assessment			Maximum Marks	Resources Required			External / Internal			
LO-08	Internal – Assignment & / Progressive	Student will be asked to (and/or): <ol style="list-style-type: none"> 1. List three applications of fiber optic coupler. 2. Define insertion loss and coupling ratio. 3. List three types of coupler and explain any one. 4. Draw and explain 3-dB Y coupler. 5. Explain directivity of an coupler. 			10	Question paper, Rating scale			Internal-Theory			
ADDITIONAL INSTRUCTIONS FOR THE HOD/ FACULTY (IF ANY)												

RGPV (Diploma Wing) Bhopal		SCHEME FOR LEARNING		Branch Code			Course Code			CO Code	LO Code	Format No. 4
		OUTCOME		0	0	1				3	9	
COURSE NAME	Optical Communication System											
CO Description	Demonstrate fiber interconnecting system											
LO Description	Demonstrate fiber splicing process (Psychomotor)											
SCHEME OF STUDY												
S. No.	Learning Content	Teaching – Learning Method	Description of T-L Process	Teach Hrs.	Pract. /Tut Hrs.	LRs Required	Remarks					
LO-09	Fusion splicing machine - Block diagram - Working principle - Major specifications Fusion splicing Process: - Equipment/ Material for fusion splicing - Splicing Process Splice housing/Enclosure	Lab demonstration, hands on practice, Lab assignments	<ul style="list-style-type: none"> 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. 	-	9	Fusion splicing machine , protecting sleeves, cleaning agent, cleaver, striper , Lab manual						
SCHEME OF ASSESSMENT												
S. No.	Method of Assessment	Description of Assessment		Maximum Marks	Resources Required			External / Internal				
LO-09	Practical test in laboratory	Student will be asked to (and/or): 1. Demonstrate splicing process. 2. Draw basic diagram of Splicing machine and explain. 3. List material/equipment for splicing of fiber ends. 4. List five major specifications of Splicing machine. 5. Describe need of splice closure.		15	Rubrics, Rating Scale			External-Practical				
ADDITIONAL INSTRUCTIONS FOR THE HOD/ FACULTY (IF ANY)												

RGPV (Diploma Wing) Bhopal		SCHEME FOR LEARNING OUTCOME			Branch Code			Course Code			CO Co de	LO Co de	Format No. 4
					0	0	1				4	10	
COURSE NAME	Optical Communication System												
CO Description	Demonstrate Optical Measuring Instrument												
LO Description	Demonstrate and use Optical power meter (Cognitive)												
SCHEME OF STUDY													
S. No.	Learning Content	Teaching – Learning Method	Description of T-L Process	Teach Hrs.	Pract. /Tut Hrs.	LRs Required	Remarks						
LO-10	Optical Power Meter (OPM) - Block diagram - Working principle - Need of calibration at different Wavelengths - Major specifications - Measurements using Optical Power Meter -	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.							
SCHEME OF ASSESSMENT													
S. No.	Method of Assessment	Description of Assessment			Maximum Marks	Resources Required	External / Internal						
LO-10	End Semester Theory Exam	Student will be asked to (and/or): 1. Describe need of Optical power meter. 2. Draw block diagram of OPM and explain. 3. Explain the need of wavelength calibration in OPM. 4. Describe the choice of photodiode in OPM. 5. List five specifications of OPM.			10	Question paper, Rating scale	External-Theory						
ADDITIONAL INSTRUCTIONS FOR THE HOD/ FACULTY (IF ANY)													

RGPV (Diploma Wing) Bhopal		SCHEME FOR LEARNING		Branch Code		Course Code		CO Code	LO Code	Format No. 4
		OUTCOME		0	0	1		4	11	
COURSE NAME	Optical Communication System									
CO Description	Demonstrate Optical Measuring Instrument									
LO Description	Demonstrate and use Optical Time Domain Reflectometer (Cognitive)									
SCHEME OF STUDY										
S. No.	Learning Content	Teaching – Learning Method	Description of T-L Process	Teach Hrs.	Pract. /Tut Hrs.	LRs Required	Remarks			
LO-11	Optical Time Domain Reflectometer (OTDR) - Block diagram - Working principle - Major specifications Use of OTDR for: - Connector loss measurement - Splice loss measurement - Cable length measurement - Identify cable break location - Attenuation Measurement	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.				
SCHEME OF ASSESSMENT										
S. No.	Method of Assessment	Description of Assessment	Maximum Marks	Resources Required	External / Internal					
LO-11	End Semester Theory Exam	Student will be asked to (and/or): 1. Write full form of OTDR. 2. Draw block diagram of OTDR and Explain. 3. List five specifications of OTDR. 4. List various measurements of OTDR. 5. Explain non destructive measurement of fiber attenuation using OTDR.	10	Question paper, Rating scale	External-Theory					
ADDITIONAL INSTRUCTIONS FOR THE HOD/ FACULTY (IF ANY)										

RGPV (Diploma Wing) Bhopal		SCHEME FOR LEARNING			Branch Code		Course Code		CO Code	LO Code	Format No. 4
		OUTCOME			0	0	1			5	
COURSE NAME	Optical Communication System										
CO Description	Know basics of Fiber To The Home (FTTH) Technology										
LO Description	Explain advantages of FTTH (Cognitive)										
SCHEME OF STUDY											
S. No.	Learning Content	Teaching – Learning Method	Description of T-L Process	Teach Hrs.	Pract. /Tut Hrs.	LRs Required	Remarks				
LO-12	<ul style="list-style-type: none"> - FTTx basic terminology - Need and Advantages of FTTH - Compare with other Broadband /DSL - FTTH Network: <ul style="list-style-type: none"> - FTTH PON Technology: Basic block diagram - Compare EPON, GPON and GEPON Standards - Downstream and Upstream signals, Multiplexing 	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					
SCHEME OF ASSESSMENT											
S. No.	Method of Assessment	Description of Assessment	Maximum Marks	Resources Required	External / Internal						
LO-12	End Semester Theory Exam	Student will be asked to (and/or): <ol style="list-style-type: none"> 1. Describe scope and features of FTTH technology. 2. Compare FTTH with other similar setups. 3. Write five FTTH terminologies and briefly explain them. 4. Distinguish between EPON, GPON and GEPON. 5. Write specifications of GPON system. 	10	Question paper, Rating scale	External-Theory						
ADDITIONAL INSTRUCTIONS FOR THE HOD/ FACULTY (IF ANY)											

RGPV (Diploma Wing) Bhopal		SCHEME FOR LEARNING OUTCOME			Branch Code 0 0 1			Course Code			CO Code 5	LO Code 13	Format No. 4
COURSE NAME		Optical Communication System											
CO Description		Know basics of Fiber To The Home (FTTH) Technology											
LO Description		Know performance of Terminal Equipment (Cognitive)											
SCHEME OF STUDY													
S. No.	Learning Content	Teaching – Learning Method	Description of T-L Process	Teach Hrs.	Pract. /Tut Hrs.	LRs Required	Remarks						
LO-13	OLTE (Optical Line Terminal Equipment): - Function - Specifications ONT/ONU: Distinguish between ONT and ONU - Function - Specifications	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 Books, PPT, Handouts, chalk board, Video lecture- NPTEL and others.							
SCHEME OF ASSESSMENT													
S. No.	Method of Assessment	Description of Assessment			Maximum Marks	Resources Required	External / Internal						
LO-13	Internal – Assignment & / Progressive	Student will be asked to (and/or): 1. Write full form of OLTE, ONT and ONU. 2. Explain function of OLTE. 3. Explain function of ONT/ONU. 4. Write three specifications of OLTE. 5. Write three specifications of ONU.			10	Question paper, Rating scale	Internal-Theory						
ADDITIONAL INSTRUCTIONS FOR THE HOD/ FACULTY (IF ANY)													

RGPV (Diploma Wing) Bhopal		SCHEME FOR LEARNING		Branch Code			Course Code			CO Code	LO Code	Format No. 4
		OUTCOME		0	0	1				5	14	
COURSE NAME	Optical Communication System											
CO Description	Know basics of Fiber To The Home (FTTH) Technology											
LO Description	Identify Passive interconnecting components (Psychomotor)											
SCHEME OF STUDY												
S. No.	Learning Content	Teaching – Learning Method	Description of T-L Process	Teach Hrs.	Pract. /Tut Hrs.	LRs Required	Remarks					
LO-14	ODN (Optical Distribution Network): - ODF (Optical Distribution Frame) - Passive Optical Splitter (POS), split ratio 1XN - Fiber Termination Cabinet(FTC) or Fiber Distribution Hub(FDH) - Fiber Optics Cables: Feeder Cable, Distribution cable, Drop cable, patch cord - Field Assembly Connector, Connector pigtails, Adapters	Lab demonstration, hands on practice, Lab assignments	<ul style="list-style-type: none"> 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. 	-	7	Various passive interconnecting devices, Fiber cables, Lab manual						
SCHEME OF ASSESSMENT												
S. No.	Method of Assessment	Description of Assessment			Maximum Marks	Resources Required			External / Internal			
LO-14	Practical test in laboratory	Student will be asked to(and/or): 1. Identify various passive FTTH interconnecting devices. 2. Explain role of fiber optic splitter. 3. Write name of fiber cables used in ODN. 4. Identify suitable connectors for FTTH N/W. 5. Define split ratio and explains its values.			10	Rubrics, Rating Scale			Internal-Practical			
ADDITIONAL INSTRUCTIONS FOR THE HOD/ FACULTY (IF ANY)												