

<b>RGPV (DIPLOMA WING) BHOPAL</b>		<b>OBE CURRICULUM FOR THE COURSE</b>		<b>FORMAT-3</b>		<b>Sheet No. 1/5</b>	
<b>Branch</b>	<b>Opto-Electronics Engineering</b>			<b>Semester</b>		<b>VI</b>	
<b>Course Code</b>		<b>Course Name</b>	<b>Optical Communication System</b>				
<b>Course Outcome 1</b>		<b>Explain Fiber optic Communication System</b>			<b>Teach Hrs</b>	<b>Marks</b>	
<b>Learning Outcome 1</b>		<b>Explain setup of Optical Communication system (Cognitive)</b>			10	10	
<b>Contents</b>		<ul style="list-style-type: none"> <li>- Introduction to optical communication system</li> <li>- Advantages of Optical Fiber Communication over coaxial cable, microwave link and other conventional communication systems</li> <li>- Optical fiber communication windows</li> <li>- Generation of optical fiber Communication</li> <li>- <b>Block Diagram</b> study of Optical transmitter and optical receivers for: <ul style="list-style-type: none"> <li>- Analog communication system</li> <li>- Digital communication system</li> </ul> </li> </ul>					
<b>Method of Assessment</b>		External-End Semester Exam					
<b>Learning Outcome 2</b>		<b>Demonstrate long haul fiber optic Digital link design parameters (Cognitive)</b>			9	10	
<b>Contents</b>		<ul style="list-style-type: none"> <li>- Regenerative repeater</li> <li>- Repeater spacing</li> <li>- Factors affecting repeater spacing</li> <li>- Power budgeting</li> <li>- Optical and Electrical Bandwidth</li> <li>- Rise time (Bandwidth) budgeting</li> </ul>					
<b>Method of Assessment</b>		External- End Semester Exam					
<b>Learning Outcome 3</b>		<b>Setup fiber optic communication link (Psychomotor)</b>			9	15	
<b>Contents</b>		<ul style="list-style-type: none"> <li>- Audio communication through optical fiber.</li> <li>- Video communication through optical fiber.</li> <li>- Digital communication through optical fiber.</li> <li>- Study of computer interfacing through optical fiber.</li> <li>- Study of telephone interfacing through optical fiber.</li> <li>- Set up for Eye pattern Analysis</li> </ul>					
<b>Method of Assessment</b>		External-Practical					

<b>RGPV (DIPLOMA WING) BHOPAL</b>		<b>OBE CURRICULUM FOR THE COURSE</b>		<b>FORMAT- 3</b>		<b>Sheet No. 2/5</b>		
<b>Branch</b>		<b>Opto-Electronics Engineering</b>			<b>Semester</b>		<b>VI</b>	
<b>Course Code</b>		<b>Course Name</b>		<b>Optical Communication System</b>				
<b>Course Outcome 2</b>		<b>Describe Advance Optical Communication Technologies</b>			<b>Teach Hrs.</b>		<b>Marks</b>	
<b>Learning Outcome 4</b>		<b>Describe need of Optical multiplexing technique (Cognitive)</b>			9		10	
<b>Contents</b>		Wavelength division multiplexing (WDM) and Demultiplexing: <ul style="list-style-type: none"> <li>- Introduction to WDM technology</li> <li>- Advantages of WDM</li> <li>- Distinguish between WDM and DWDM</li> <li>- Block diagram of WDM Techniques</li> <li>- Schematic diagrams of various WDM demultiplexing techniques</li> </ul>						
<b>Method of Assessment</b>		External-End Semester Exam						
<b>Learning Outcome 5</b>		<b>Describe Performance of Optical Amplifier (Cognitive)</b>			8		10	
<b>Contents</b>		<ul style="list-style-type: none"> <li>- Erbium Doped Fiber Amplifier (<b>EDFA</b>) <ul style="list-style-type: none"> <li>- Block diagram and Working principle</li> <li>- Wavelength of operation</li> <li>- Advantages as compared to regenerative repeater</li> </ul> </li> </ul>						
<b>Method of Assessment</b>		Internal- Assignment &/ Progressive						

<b>RGPV (DIPLOMA WING) BHOPAL</b>		<b>OBE CURRICULUM FOR THE COURSE</b>		<b>FORMAT- 3</b>		<b>Sheet No. 3/5</b>	
<b>Branch</b>	<b>Opto-Electronics Engineering</b>			<b>Semester</b>		<b>VI</b>	
<b>Course Code</b>		<b>Course Name</b>	<b>Optical Communication System</b>				
<b>Course Outcome 3</b>		<b>Demonstrate fiber interconnecting system</b>			<b>Teach Hrs.</b>	<b>Marks</b>	
<b>Learning Outcome 6</b>		<b>Appreciate importance of fiber interconnecting devices (Cognitive)</b>			9	10	
<b>Contents</b>		<ul style="list-style-type: none"> <li>- Need of connectors and splice</li> <li>- Comparison between connector and splice</li> <li>- Connector/Splice losses</li> <li>- Misalignment Losses: <ul style="list-style-type: none"> <li>- Lateral misalignment</li> <li>- End separation</li> <li>- Angular misalignment</li> </ul> </li> </ul>					
<b>Method of Assessment</b>		External- End Semester Exam					
<b>Learning Outcome 7</b>		<b>Identify useful fiber connectors (Psychomotor)</b>			7	10	
<b>Contents</b>		Types of connectors: Identification, features and Comparison of: <ul style="list-style-type: none"> <li>- ST</li> <li>- SMA</li> <li>- LC</li> <li>- SC connector</li> </ul>					
<b>Method of Assessment</b>		Internal- Practical					
<b>Learning Outcome 8</b>		<b>Know specifications of fiber optic coupler (Cognitive)</b>			8	10	
<b>Contents</b>		<ul style="list-style-type: none"> <li>- Introduction, need and coupler applications</li> <li>- Basic coupler parameters: <ol style="list-style-type: none"> <li>a) Excess loss/Insertion Loss</li> <li>b) Coupling Ratio</li> <li>c) Directivity</li> </ol> </li> <li>- Types of couplers</li> <li>- Star coupler</li> <li>- 3-dB Coupler</li> <li>- Applications of specific couplers</li> </ul>					
<b>Method of Assessment</b>		Internal- Assignment &/ Progressive					

<b>Learning Outcome 9</b>	<b>Demonstrate fiber splicing process (Psychomotor)</b>	9	15
<b>Contents</b>	Fusion splicing machine <ul style="list-style-type: none"> <li>- Block diagram</li> <li>- Working principle</li> <li>- Major specifications</li> </ul> Fusion splicing Process: <ul style="list-style-type: none"> <li>- Equipment/ Material for fusion splicing</li> <li>- Splicing Process</li> </ul> Splice housing/Enclosure		
<b>Method of Assessment</b>	External- Practical		

<b>RGPV (DIPLOMA WING) BHOPAL</b>		<b>OBE CURRICULUM FOR THE COURSE</b>		<b>FORMAT- 3</b>		<b>Sheet No. 4/5</b>		
<b>Branch</b>		<b>Opto-Electronics Engineering</b>			<b>Semester</b>		<b>VI</b>	
<b>Course Code</b>		<b>Course Name</b>		<b>Optical Communication System</b>				
<b>Course Outcome 4</b>		<b>Demonstrate Instrument</b>		<b>Optical Measuring</b>		<b>Teach Hrs.</b>	<b>Marks</b>	
<b>Learning Outcome 10</b>		<b>Demonstrate and use Optical power meter (Cognitive)</b>				9	10	
<b>Contents</b>		Optical Power Meter (OPM) <ul style="list-style-type: none"> <li>- Block diagram</li> <li>- Working principle</li> <li>- Need of calibration at different Wavelengths</li> <li>- Major specifications</li> <li>- Measurements using Optical Power Meter</li> </ul>						
<b>Method of Assessment</b>		External-End Semester Exam						
<b>Learning Outcome 11</b>		<b>Demonstrate and use Optical Time Domain Reflectometer (Cognitive)</b>				9	10	
<b>Contents</b>		Optical Time Domain Reflectometer (OTDR) <ul style="list-style-type: none"> <li>- Block diagram</li> <li>- Working principle</li> <li>- Major specifications</li> </ul> Use of OTDR for: <ul style="list-style-type: none"> <li>- Connector loss measurement</li> <li>- Splice loss measurement</li> <li>- Cable length measurement</li> <li>- Identify cable break location</li> <li>- Attenuation Measurement</li> </ul>						
<b>Method of Assessment</b>		External- End Semester Exam						

<b>RGPV (DIPLOMA WING) BHOPAL</b>		<b>OBE CURRICULUM FOR THE COURSE</b>		<b>FORMAT- 3</b>		<b>Sheet No. 5/5</b>		
<b>Branch</b>		<b>Opto-Electronics Engineering</b>			<b>Semester</b>		<b>VI</b>	
<b>Course Code</b>		<b>Course Name</b>		<b>Optical Communication System</b>				
<b>Course Outcome 5</b>		<b>Know basics of Fiber To The Home (FTTH) Technology</b>			<b>Teach Hrs.</b>		<b>Marks</b>	
<b>Learning Outcome 12</b>		<b>Explain advantages of FTTH (Cognitive)</b>			9		10	
<b>Contents</b>		<ul style="list-style-type: none"> <li>- FTTx basic terminology</li> <li>- Need and Advantages of FTTH</li> <li>- Compare with other Broadband /DSL</li> <li>- FTTH Network: <ul style="list-style-type: none"> <li>- FTTH PON Technology: Basic block diagram</li> <li>- Compare EPON, GPON and GEAPON Standards</li> <li>- Downstream and Upstream signals, Multiplexing</li> </ul> </li> </ul>						
<b>Method of Assessment</b>		External- End Semester Exam						
<b>Learning Outcome 13</b>		<b>Know performance of Terminal Equipment (Cognitive)</b>			8		10	
<b>Contents</b>		<b>OLTE (Optical Line Terminal Equipment):</b> <ul style="list-style-type: none"> <li>- Function</li> <li>- Specifications</li> </ul> <b>ONT/ONU:</b> Distinguish between ONT and ONU <ul style="list-style-type: none"> <li>- Function</li> <li>- Specifications</li> </ul>						
<b>Method of Assessment</b>		Internal-Assignment &/Progressive						
<b>Learning Outcome 14</b>		<b>Identify Passive interconnecting components (Psychomotor)</b>			7		10	
<b>Contents</b>		ODN (Optical Distribution Network): <ul style="list-style-type: none"> <li>- ODF (Optical Distribution Frame)</li> <li>- Passive Optical Splitter (POS), split ratio 1XN</li> <li>- Fiber Termination Cabinet(FTC) or Fiber Distribution Hub(FDH)</li> <li>- Fiber Optics Cables: Feeder Cable, Distribution cable, Drop cable, patch cord</li> <li>- Field Assembly Connector, Connector pigtails, Adapters</li> </ul>						
<b>Method of Assessment</b>		Internal- Practical						

### Suggested List of Experiments:

S.N.	Experiment	CO
1.	Audio communication through optical fiber.	01
2.	Video communication through optical fiber	01
3.	Digital communication through optical fiber.	01
4.	Study of computer interfacing through optical fiber.	01
5.	Study of telephone interfacing through optical fiber	01
6.	Study of Eye Pattern Analysis	01
7.	Optical Power Measurement	02
8.	Measurements using OTDR	04
9.	Demonstration of Fusion splicing	03
10.	Demonstration of Connector assembling	03
11.	Demonstrate GPON distribution Network Component	05

### Reference Books/Web Portals:

S.N.	Title	Author/Publisher
1	Optical Fiber Communication	By John M Senior
2	Optical Fiber Communication	By Gerd Keiser
4	<a href="https://www.thefoa.org">https://www.thefoa.org</a>	
5	<a href="https://www.tutorialspoint.com/ftth">https://www.tutorialspoint.com/ftth</a>	
6.	Youtube video on Optical Power meter, OTDR and Splicing machine	