Devi Ahilya University, Indore, India Institute of Engineering & Technology				ME I Year Electronics (Sp. Digital Instrumentation) Semester- A			
Subject Code & Name	**Instructions Hours per Week**			**Credits**			
DIP1G3: Advanced Communication Networks	**L**	**T**	**P**	**L**	**T**	**P**	**Total**
Duration of Theory Paper: 3 Hours	**3**	**1**	**0**	**3**	**1**	**0**	**4**

COURSE CONTENTS

Unit I

Fundamentals of communication Networks: Basics of optical communication and computer networking: services, switching, multiplexing schemes, telecom network overview and architecture, optical networks, WDM optical networks, WDM network evolution, WDM network construction, broadcast and select optical WDM network, Challenges of optical WDM network.

Unit II

Optical network Components: Optical transmitters, semiconductor laser diode, tunable and fixed laser, laser characteristics, photodetectors, tunable and fixed optical filters, optical amplifiers and its characteristics, semiconductor laser amplifier, Raman amplifier, doped fiber amplifier, various switching elements, OADM, OXC, architecture, MEMS, wavelength convertors, Couplers, isolators, circulators, optical line terminals, all optical cross connect configurations.

Unit III

Optical network architecture: Synchronous optical network/ synchronous digital heirarchy- elements, multiplexing, layers, SONET physical layer, frame structure, WDM network architectures, QoS parameters for optical networks, wavelength routed networks, routing and wavelength assignment (RWA), optical multicast routing, access networks.

Unit IV

Wavelength routing and Survivability: Classification of RWA algorithms, Problem formulation, routing sub-problem: fixed routing, fixed alternate routing, adaptive routing, fault tolerant routing, wavelength assignment sub-problem, wavelength reuse and conversion criterions, algorithms: flow deviation algorithm, fairness and admission control, restoration schemes, multiplexing schemes, provisioning restorable single fiber networks.

Unit V

Wireless adhoc networks: Introduction to ad-hoc networks, MAC Protocols for ad hoc networks, routing protocols, Transport layer, Cross layer design for ad hoc networks. Wireless sensor networks (WSN), MAC protocol for WSN, routing protocol, data management and security, applications

Text and Reference Books:

[1] Optical networks – Apractical prespective : Rajiv Ramaswami and K N Sivarajan, Morgan Kaufmann Publishers, 2002.

[2] WDM optical Networks: Concepts, Design and algorithms , C. Siva Ram Murthy and Mohan Gurusamy, PHI, 2011.

[3] Mukherjee, B- Optical communication networks", Mc-Graw Hill, New York,1997.

[4] C. Siva Ram Murthy and B.S.Manoj, Ad hoc Wireless Networks Architectures and protocols, 2nd edition, Pearson Education, 2007.

[5] C.S.Raghavendra Krishna, M.Sivalingam and Tarib znati, "Wireless Sensor Networks", Springer publication, 2004.