Devi Ahilya University, Indore, India Institute of Engineering & Technology				ME – I Year (Spl Digital Communication) Semester- B			
Subject Code & Name	**Instructions Hours per Week**			**Credits**			
DCP3G1 **Broadband Access Networks**	**L**	**T**	**P**	**L**	**T**	**P**	**Total**
	3	**1**	**0**	**3**	**1**	**0**	**4**
Duration of Theory Paper: **3 Hours**							

Course Objectives: To provide a detailed structure and working of different networks used for accessing broadband signals.

Prerequisite(s): knowledge of analog and digital communication and basic.s of computer networks

COURSE CONTENTS

Unit 1

Introduction: Broadband access, Its definition, coverage and economin impact, Legacy broadband technologies, Fixed wireline broadband technologies (Digital subscriber line, Cable modem, Broadband over power line), Fixed wireless broadband technologies (MMDS, Free space optics , Satellite) Mobile wireless broadband technologies (GPRS, EDGE, UMTS).

Unit2

WLAN: Types, System architecture, Protocol Architecture, Medium access control CSMA/CA, Comparison of IEEE varients of WLAN (IEEE 802.11 – 802.11 ac), Frame formats, Modulation and coding, High Throughput WLANs., Wi-Fi based Wireless Mesh Networks.

Unit 3

WiMax: System Overview, Fixed Wi-Max, Mobile Wi-max, Physical Layer Overview (Modulation and coding, Physical and logical channels, Multiple antenna Techniques, Link Control), MAC Layer, Multihop relay WiMAX , Gigabit WiMAX, Wi-Max based Wireless Mesh Networks.

Unit 4

Optical Networking: Introduction and challenges- Advantages of optical network, WDM optical networks, WDM network evolution, WDM network construction, broadcast and select optical WDM network, wavelength routed optical WDM network, Challenges of optical WDMnetwork.**Optical Access Network** Introduction to access network, PON, EPON , GPON and WDMEPON: overview, principal of operation, architecture, standards; dynamic Bandwidth allocation and Quality of Service.

Unit 5

Optical switching &FiWi access networks Optical packet switching basics, slotted and unslotted networks, header and packet format, contention resolution in OPS networks, self routing, examples on OPS node architecture, optical burst switching, signaling and routing protocols for OBS networks, contention resolution in OBS networks, Radio over Fiber, Radio and Fiber, Integration of EPON and WiMax, Hybrid Wireless-Optical Broadband Access Network / Fiber wireless (FiWi) access networks.

BOOKS RECOMMENDED:

[1]. Optical Network Series: Biswanath Mukherjee, Springer, 2006.
[2]. Optical Networks: R.Ramaswami and K.Sivarajan, Â Morgan Kaufmann Publishers, 2nd ed., 2002.
[3]. A. F. Molisch, "Wireless Communicatins", Second Edition, Wiley Publications, 2014.
[4]. Schiller, “Wireless Communications”, Second Edition, Pearson Education, 2008.
[5]. 3. Optical Switching Networks: Mayer & Martin, Cambridge University Press, 2008.
[6]. Broadband Access Networks -Technologies and Deployments, Editors: Shami, Abdallah, Maier, Martin, Assi, Chadi (Eds.) , Springer, 2009.
[7]. FiWi Access Networks, Martin Maier, NavidGhazisaidi, Cambridge University Press,2011.