



**Course Title: ADVANCED TELECOM TECHNOLOGIIES**

**Credit Units: 4**

**Course Level: PG**

**Course Code:TELE702**

L	T	P/S	SW/F W	TOTAL CREDIT UNITS
3	1	0	0	4

**Course Objectives:** The aim of this course is to acquaint the students about new generation telecom technologies being launched or being developed /deployed.

**Pre-requisites:** Wireless Broadband Access Technologies, Cellular Communication and GSM, CDMA and 3G.

**Course Contents/Syllabus:**

	Weightage (%)
<b>Module I MPLS</b>	<b>20</b>
<b>Descriptors/Topics</b> Introduction: Label switching basics, Switching and forwarding Operations, MPLS key concepts, LabelDistributionOperations MPLS protocols, Recovery mechanism, comparison with Frame relay and ATM, traffic engineering in MPLS network.	
<b>Module II 4G &amp; LTE</b>	<b>25</b>
<b>Descriptors/Topics</b> LTE: What is 4G,Fixed Mobile Convergence, 4G networks expectations and requirements, LTE, down link transmission scheme, uplink transmission scheme, LTE architecture and technology, protocol architecture, , LTE advanced, LTE deployment status, LTE Vs Wi-Max IEEE802.16m	
<b>Module III Wireless Sensor Networks</b>	<b>25</b>
<b>Descriptors/Topics</b> Architectural Elements Basic Sensor Network, Applications of Sensor Networks, Comparison with Ad Hoc Wireless Networks, Challenges and Hurdles. Architecture of WSNs Hardware components, Operating systems and execution environments, some examples of sensor nodes, Network Architecture, Sensor networks scenarios, Optimization goals	

and figures of merit, Design principles for WSNs. Applications of WSNs.	
<b>Module IV: Next Generation Networks</b>	<b>20</b>
<b>Descriptors/Topics</b> Introduction to all-IP Networks NGN, Advantages of NGN, fundamental characteristics, functional plane and network elements of NGN ,basics of IMS and soft switch, significance of IMS in NG Networks, WPAN (UWB)	
<b>Module V Green Telecom</b>	<b>10</b>
<b>Descriptors/Topics</b> Motivation for green Telecom, green house gases & carbon foot print, estimating carbon foot print, carbon credit policy for telecom industry.  Domestic and Global efforts for reduction of carbon footprint, methods for reducing carbon footprint, adaption of energy efficient equipments and technologies, e-waste and its management, TRAI's role.	

### **Student Learning Outcomes:**

- (i) Student shall be able to explain basics of MPLS key concepts, Label distribution operations and compare MPLS with Frame Relay and ATM
- (ii) Student shall be able to describe requirements of UMTS and expectations from 4<sup>th</sup> generation cellular systems as well as evolution of LTE from 3<sup>rd</sup> generation cellular systems.
- (iii) Student shall be able to explain characteristics of WSN, their architecture, addressing ,routing mechanism and applications.
- (iv) Student shall be able to explain fundamentals of all-IP Next Generation Networks, their architecture and applications telecom industry.
- (v) Student shall be able to explain advantages of using green telecom technologies and their impact on protecting environment through reduction of Carbon Foot Print. Also explain concept of carbon credit policy as motivation to use global warming.
- (vi) As a telecom professional student will be able to demonstrate his knowledge by selecting most economical and energy efficient telecom systems

### **Pedagogy for Course Delivery:**

Lectures, Presentations ,Industry visits, Uploading of course material on AMIZONE

**Lab/ Practicals details, if applicable:NA**

**Assessment/ Examination Scheme:**

<b>Theory L/T (%)</b>	<b>Lab/Practical/Studio (%)</b>	<b>Total</b>
100%	NA	100

**Theory Assessment (L&T):**

<b>Continuous Assessment/Internal Assessment</b>					<b>End Term Examination</b>
<b>Components (Drop down)</b>	Class Test	Home Assignment	S/V/Q	Attendance	End Term Examination
<b>Weightage (%)</b>	10%	10%	5%	5%	70%

**Text Reading:**

- MPLS & Label Switching, Second Edition, Uyles Black, Pearson Education Asia
- Carrier Grade Voice over IP, Second Edition, Daniel Collins
- Wireless Communications and Networks, Second Edition, William Stallings
- Wireless Sensor Networks Technology, Protocols, and applications by Kazem Sohraby, Daniel Minoli, Taieb Znati, John Wiley & Sons.

**References:**

- Telecom Regulatory Authority of India Consultation paper on Green Telecommunication 3rd February, 2011