Course Code	Course Name	Teaching Scheme (Contact Hours)			Credits Assigned			
		Theory	Practical	Tutorial	Theory	Practical	Tutorial	Total
ECCDLO 5011	Digital and IP TV Engineering	03	--	--	03	--	--	03

Subject Code	Subject Name	Examination Scheme							
		Theory Marks				Exam Duration (Hrs.)	Term work	Practical and Oral	Total
		Internal assessment			End Sem. Exam				
		Test1	Test 2	Avg.					
ECCDLO 5011	Digital and IP TV Engineering	20	20	20	80	03	--	--	100

Prerequisite:

1. Basics of various Television standards and operation
2. TCP/IP Protocol
3. Basics of conventional video camera and standards

Course Objectives:

1. To provide in depth knowledge about Digital Television system
2. To familiarize students' various types of advanced types of Video cameras and Displays
3. To introduce the students to different television standards and applications
4. Acquaintance with HDTV and 3D TV system
5. To familiarize the students to IPTV, Its architecture, Protocols and hardware
6. To Introduce students to IP delivery networks, threats and mitigation

Course Outcomes:

After successful completion of the course student will be able to:

1) Understand the working principles of advanced digital television systems.
2) Enable to choose or develop an appropriate camcorder and displays based on applications.
3) Familiar with current digital TV standards.
4) Evaluate the Stereoscopic images and binocular depth perception.
5) Acquire knowledge of IPTV and develop hardware and protocols.
6) Ability to provide customized IPTV services to end user.

Module No	Unit No	Topics	Hrs
1		**Fundamentals of Digital Television**	7
	1.1	Fundamentals of colour television, Compatibility, and reverse compatibility, colour perception, Three colour theory, luminance, hue and saturation. Interlaced scanning, Composite video signal	
	1.1	Introduction to Digital TV, Digital TV signals and parameters	
	1.2	Digital TV transmitter and Receiver its merits and demerits	
	1.3	MAC Signals and advanced MAC Signal Transmission	
	1.4	Digitization, Chroma sub sampling, Digital audio compression techniques and video compression techniques MPEG1,MPEG2,H.264,MPEG- 4,AVC,H.265, SMPTE 421M,	
	1.5	Set Top Box with recording	
2		**Digital Video Cameras, Displays and Streaming media device**	5
	2.1	Colour TV Digital cameras, Camcorders, Handycams, and Digicams	
	2.2	LED, LCD, OLED, PLASMA, Quantum Dot LED Displays	
	2.3	Chromecast	
	2.4	Consumer applications: DVD, Blue ray DVD	
3		**Digital TV standards and advanced TV**	8
	3.1	DVB-T, and its successors	
	3.2	ISDB -T	
	3.3	ATSC	
	3.4	ISD TV	
	3.5	DTMB	
	3.6	Ultra HDTV	
	3.7	CCTV	
	3.8	Direct to Home TV(DTH)	
	3.9	Smart TV and its functions	
	3.10	3D TV	
4		**IPTV**	6
	4.1	Introduction to IPTV	
	4.2	IP TV hardware	
	4.3	Features of IPTV	
	4.4	Architecture of IPTV	
	4.5	Bandwidth requirement	
	4.6	IPTV Set top Box, Smart TV comparison	
5		**IP TV Protocols and Applications**	9
	5.1	Internet Group Management Protocol (IGMP)	
	5.2	Real-Time Streaming Protocol (RTSP)	
	5.3	Real-Time Messaging Protocol (RTMP)	
	5.4	Hypertext Transfer Protocol (HTTP).	
	5.5	Applications of IPTV	

	5.6	IPTV Delivery: Broad cast. Unicast, Multicast	
	5.7	IPTV Streaming: Time Shifted Stream-On -the- fly streaming	
	5.8	experimental framework used for evaluating the classification algorithm	
	5.9	Experimental framework for evaluating the classification algorithm (Self learning) Configuring IPTV to android phone, Tablet, Television and Computer(Self Learning)	
6		**IPTV Network Security: Threats and Countermeasures**	**4**
	6.1	Threats on IPTV Delivery Networks, Theft or Abuse of Network Assets, Theft of Service, Theft of IPTV-Related Data, Disruption of Service, Privacy Breach, Compromise of Platform Integrity	
	6.2	Security Issues of IPTV Delivery Networks: Protocols Vulnerabilities, Countering the threats	
	6.3	Advantages and disadvantages of IPTV	
	6.4	Future of IPTV	
		Total	**39**

Textbooks:

1.Television and video Engineering, A. M. Dhake, Tata McGraw Hill Publication.

2. Video Demystified, Kelth jack, Hand book for digital engineers, Newness, Elsevier

3.Digital Television Systems. Marcelo S. Alencar, Cambridge University Press

4.Understanding IPTV, Gilbert Held, CRC Press

Reference Books:

1.The digital evolution of Television, D. Gerbarg, Springer

2. Applications and Usability of interactive TV, Maris Jos Abisolo, Springer

3. IPTV Delivery network, Suliman Mohamed Fati, Saiful Azad, Al-Sakib Khan Pathan, Wiley Publications

4. Television Engineering & Video Systems, R. G. Gupta, McGraw Hill Publication

5. Quantum dot based light emitting diodes, Morteza Sasani Ghamsari, Google book

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Internal Assessment (20-Marks):

Internal Assessment (IA) consists of two class tests of 20 marks each. IA-1 is to be conducted on approximately 40% of the syllabus completed and IA-2 will be based on remaining contents (approximately 40% syllabus but excluding contents covered in IA-I). Duration of each test shall be one hour. Average of the two tests will be considered as IA marks.