## SEMESTER S7

## ENTERTAINMENT ELECTRONICS

| Course Code | OEEVT722 | CIE Marks | 40 |
|---|---|---|---|
| Teaching Hours/Week (L: T:P: R) | 3:0:0:0 | ESE Marks | 60 |
| Credits | 3 | Exam Hours | 2 Hrs. 30 Min. |
| Prerequisites (if any) | None | Course Type | Theory |

**Course Objectives:**

1. To provide broad knowledge on various industry standards, algorithms and technologies used to carry out digital audio and video broadcasting in infotainment industry.

## SYLLABUS

| Module No. | Syllabus Description | Contact Hours |
|---|---|---|
| 1 | Review of Analog Television: Scanning, Horizontal and Vertical Synchronization, Color information, Transmission methods. NTSC and PAL standards.<br>Digital media streaming: Packetized elementary stream of audio-video data, MPEG data stream, MPEG-2 transport stream packet, Accessing a program, scrambled programs, program synchronization. PSI, Additional (Network information and service description) information in data streams for set-top boxes. | 9 |
| 2 | Digital Video Broadcasting (DVB): Satellite TV broadcasting – DVB-S Parameters, DVB-S Modulator, DVB-S set-top box, DVB-S2. Cable TV broadcasting – DVB-C Standard, DVB-C Modulator, DVB- C set-top box.<br>Terrestrial TV broadcasting – DVB-T Standard, DVB-T Modulator, DVB-T Carriers and System Parameters, DVB-T receiver.Broadcasting for Handheld devices – DVB-H Standard DVB tele-text, DVB subtitling system.<br>Digital Audio Broadcasting (DAB): Comparison of DAB with DVB. Physical layer of DAB. DAB Modulator, DAB Data Structure, DAB single frequency networks, Data broadcastingusing DAB. | 9 |

| | | |
|---|---|---|
| **3** | High Definition Video and Audio: Pixel resolution, Comparison with Standard Definition TV, Review of Discrete Cosine Transforms (DCT), Video Compression - Quantization levels, Horizontal/Vertical blanking interval, Vertical Color resolution, DPCM of moving pictures, DCT, Run-length coding. MPEG-4 Video coding. | 9 |
| **4** | Display Technology: Block diagram of video reproduction system in a TV, Cathode Ray tubes, Basic principle of Plasma displays, LC displays, Light-emitting diode displays, Field emission displays, Organic light emitting device displays.<br>Television of future: Holographic TV, Virtual Reality, Augmented Reality. | 9 |

**Course Assessment Method**
**(CIE: 40 marks, ESE: 60 marks)**

**Continuous Internal Evaluation Marks (CIE):**

| Attendance | Assignment/ Microproject | Internal Examination-1 (Written) | Internal Examination- 2 (Written ) | Total |
|---|---|---|---|---|
| **5** | **15** | **10** | **10** | **40** |

**End Semester Examination Marks (ESE)**

*In Part A, all questions need to be answered and in Part B, each student can choose any one full question out of two questions*

| Part A | Part B | Total |
|---|---|---|
| • 2 Questions from each module.<br>• Total of 8 Questions, each carrying 3 marks<br>**(8x3 =24marks)** | • Each question carries 9 marks.<br>• Two questions will be given from each module, out of which 1 question should be answered.<br>• Each question can have a maximum of 3 sub divisions.<br>**(4x9 = 36 marks)** | **60** |

## Course Outcomes (COs)

At the end of the course students should be able to:

| Course Outcome | | Bloom's Knowledge Level (KL) |
|---|---|---|
| **CO1** | Understand packetized streaming of digital media happens in the field of infotainment industry. | **K2** |
| **CO2** | Realise the critical aspects of DVB and DAB standards used for media broadcasting | **K2** |
| **CO3** | Apply video coding/compression algorithms are used to produce high-definition video in MPEG-4 standard | **K3** |
| **CO4** | Understand modern display technologies for video reproduction | **K2** |

Note*: K1- Remember, K2- Understand, K3- Apply, K4- Analyse, K5- Evaluate, K6- Create*

## CO-PO Mapping Table (Mapping od Course Outcomes to Program Outcomes)

| | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **CO1** | **3** | **3** | | | | | | | | | | **2** |
| **CO2** | **3** | **3** | | | **2** | | | | | | **2** | **2** |
| **CO3** | **3** | **3** | | | **3** | | | | | | **2** | **2** |
| **CO4** | **3** | **3** | | | | | | | | | | **2** |

Note: *1: Slight (Low), 2: Moderate (Medium), 3: Substantial (High), -: No Correlation*

| Text Books | | | | |
|---|---|---|---|---|
| **Sl. No** | **Title of the Book** | **Name of the Author/s** | **Name of the Publisher** | **Edition and Year** |
| 1 | Digital Video and Audio Broadcasting Technology: A Practical Engineering Guide (Signals and Communication Technology) | W. Fischer | Springer | 2020 |
| 2 | Understanding Digital Television An Introduction to DVB Systems with Satellite, Cable, Broadband and Terrestrial TV,. | Lars-Ingemar Lundström | Focal Press,Elsevier | 2006 |
| 3 | Newnes Guide to Televeision and Video Technology | K F Ibrahim | Newnes | 2007 |
| 4 | Introduction to Flat Panel Displays | Jiun-Haw Lee, David N. Liu, Shin-Tson Wu | Wiley | 2008 |

| Reference Books | | | | |
|---|---|---|---|---|
| **Sl. No** | **Title of the Book** | **Name of the Author/s** | **Name of the Publisher** | **Edition and Year** |
| 1 | Digital Video and HD Algorithms and Interfaces," | C. Poynton | Morgan Kaufmann | 2012. |
| 2 | Digital audio broadcasting: principles and applications of DAB, DAB+ and DMB | Wolfgang Hoeg, Thomas Lauterbach | Wiley | 2009. |
| 3 | Introduction to Digital Audio | John Watkinson | Focal Press | 1994. |
| 4 | Art of Digital Video, | John Watkinson | Focal Press | 2008 |
| 5 | Introduction to Digital Video, | John Watkinson | Focal Press | 2001 |

| Video Links (NPTEL, SWAYAM…) | |
|---|---|
| **Module No.** | **Link ID** |
| **1** | https://www.youtube.com/watch?v=M_nTmRtAD98 |
| **2** | https://www.youtube.com/watch?v=aTDr79yvUus |
| **3** | https://www.youtube.com/watch?v=g_ysg46q-jQ |
| **4** | https://www.youtube.com/watch?v=4BaDaGTUgIY |