**GOVERNMENT POLYTECHNIC**

**CHHAPRA**



COURSE FILE (Lecture Plan)

OF

**CONSUMER ELECTRONICS (2021402)**

Faculty Name:

Prof. SAURAV KUMAR

Lecturer

**DEPARTMENT OF ELECTRONICS ENGINEERING**

|  |
| --- |
| **STATE BOARD OF TECHNICAL EDUCATION** |
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Department of Electronics Engineering

**Vision**

To be a centre of excellence in the field of Electronics Engineering offering value based world class education and research producing well qualified engineers, who can contribute favorably to the technological and socio-economic development of the nation.

**Mission**

1. To ensure sufficient modern technological exposure to the students in order to create skilled professionals.

2. To frequently update the labs keeping in view the requirement of the current industry scenario.

3. To extend counseling and career guidance facility to the students to help them to achieve their goal.

4. To encourage faculties and staffs to pursue higher education and to do the research work.

5. To encourage faculties and staffs to participate in various seminars, conferences and workshops to keep themselves updated of the state-of-the-art technology.

**Course Description:-**

Consumer electronics or home electronics are electronic (analog or digital) equipment intended for everyday use, typically in private homes. Consumer electronics include devices used for entertainment, communications and recreation. This course will introduce the students with working principles, of consumer electronics appliances like audio-video systems, microwave oven, washing machine, air-conditioner, camcorder and others to develop skills to troubleshoot in systematic way.

**Course Objectives:-**

The aim of this course is to help the students to attain the following industry identified competency through various teaching learning experiences:

* *Maintain various consumer electronic appliances/equipment’s*

**Course Syllabus**

**CONSUMER ELECTRONICS (ELECTRONICS ENGINEERING GROUP)**

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **Subject Code 2021402** | **Theory** | | |  | | | **Credits** |
| **No. of Periods Per Week** | | | **Full Marks** | **:** | **100** | **03** |
| **L** | **T** | **P/S** | **ESE** | **:** | **70** |
| **03** | **-** | **-** | **TA** | **:** | **10** |
| **-** | **-** | **-** | **CT** | **:** | **20** |

**Course Objectives:** The aim of this course is to help the students to attain the following industry identified competency through various teaching learning experiences: Maintain various consumer electronic appliances/ equipment’s.

|  |  |  |
| --- | --- | --- |
| **Chapter** | **Name of the Topic** | **Hours** |
| **Unit I** | **Audio Fundamentals and Devices**  Basic characteristics of sound signal, Audio level metering, decibel level in acoustic measurement Microphone & Types, speaker types & working principle, Sound recording principle & types. | **12** |
| **Unit II** | **Audio Systems**  CD player, home theatre sound system, surround sound, Digital console block diagram, working principle, applications, FM tuner , ICs used in FM tuner TDA 7021T , PA address system. | **12** |
| **Unit III** | **Television Systems-**  Monochrome TV standards, scanning process, aspect ratio, persistence of vision and flicker, interlace scanning, picture resolution, Composite video signal, Colour TV standards, colour theory, hue, brightness, saturation, luminance and chrominance, Different types of TV camera, Transmission standards. | **14** |
| **Unit IV** | **Television Receivers and Video Systems-**  PAL-D colour TV receiver, Digital TVs:- LCD, LED , PLASMA, HDTV, 3- D TV, projection TV, DTH receiver, Video interface,  Digital Video, SDI, HDMI Multimedia Interface, Digital Video Interface, CD and DVD player. | **12** |
| **Unit V** | **Home / Office Appliances**  Diagrams, operating principles and controller for FAX and Photocopier, Microwave Oven, Washing Machine, Air conditioner and Refrigerators, Digital camera and camcoder. | **10** |
|  | **TOTAL** | **60** |

**References:**

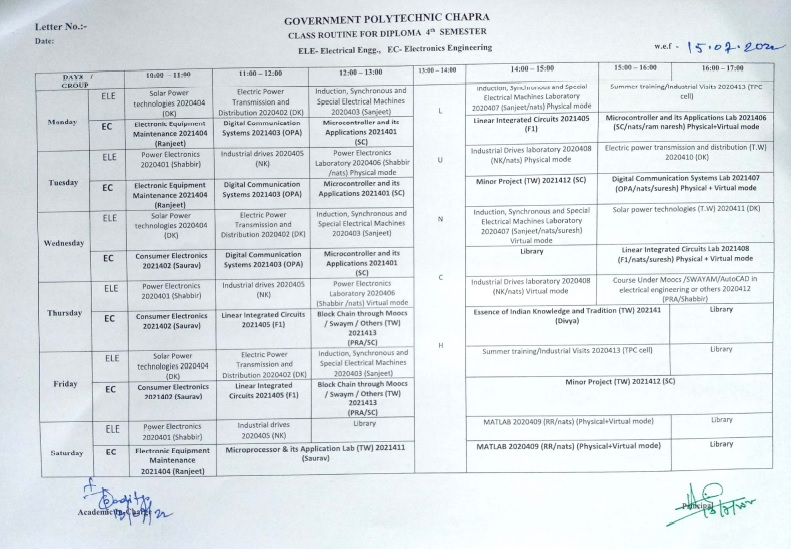
|  |  |  |  |
| --- | --- | --- | --- |
| **S. No.** | **Title of Book** | **Author** | **Publication** |
| 1. | Consumer Electronics | Bali S.P. | Pearson Education India,2010 , latest edition |
| 2. | Audio video systems : principle practices & troubleshooting | Bali R and Bali S.P | Khanna Book Publishing Co. (P)  Ltd., 2010Delhi , India, latest edition |
| 3. | Modern Television practices | Gulati R.R. | New Age International Publication  (P) Ltd. New Delhi Year 2011, latest edition |
| 4. | Audio video systems | Gupta R.G. | Tata Mc graw Hill, New Delhi, India 2010, latest  edition |
| 5. | Mastering Digital Television | Whitaker Jerry & Benson Blair | McGraw-Hill Professional, 2010, latest edition |
| 6. | Consumer Electronics | Neeraj Sharma | FPH (Foundation Publishing House) |
| 7. | Standard hand book of Audio engineering | Whitaker Jerry & Benson Blair | McGraw-Hill Professional, 2010, latest edition. |

**Course outcomes:**

The theory, practical experiences and relevant soft skills associated with this course are to be taught and implemented, so that the student demonstrates the following industry oriented COs associated with the above mentioned objective:

* Different types of microphones and speakers
* Maintain audio systems
* Analyse the composite video signal used in TV signal transmission
* Troubleshoot colour TV receiver
* Maintain various consumer electronic appliances

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<https://www.gpchhapra.org.in/2022/07/13/class-routine-notice/>

**TIME TABLE**

**FACULTY:-** Prof.Saurav Kumar (Electronics Engineering Department)

**GOVERNMENT POLYTECHNIC CHAPRA**

**CLASS ROUTINE FOR DIPLOMA 4th SEMESTER EC- Electronics Engineering**

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
|  | 1st  10:00-11:00 | 2nd  1:00-12:00 | 3rd  12:00-1:00 |  | 4th  2:00-3:00 | 5th  3:00-4:00 | 6th  4:00-5:00 |
| MON |  |  |  | L  U  N  C  H |  |  |  |
| TUE |  |  |  |  |  |  |
| WED | **Consumer Electronics 2021402 (Saurav Kumar)** |  |  |  |  |  |
| THU | **Consumer Electronics 2021402 (Saurav Kumar)** |  |  |  |  |  |
| FRI | **Consumer Electronics 2021402 (Saurav Kumar)** |  |  |  |  |  |
| SAT |  |  |  |  |  |  |

**Student list**

**Electronics Engineering.**

|  |  |
| --- | --- |
| **Roll Number** | **Name Of the Student** |
| 311132120001 | AKANSKSHA KUMARI |
| 311132120002 | ABHISHEK RAJAK |
| 311132120003 | SULEKHA KUMARI |
| 311132120004 | ABHISHEK KUMAR UPADHAYAY |
| 311132120006 | DILIP KUMAR RAM |
| 311132120008 | SANDHYA KUMARI |
| 311132120009 | MONIKA KUMARI |
| 311132120010 | ANAND KUMAR SINGH |
| 311132120011 | SUMIT KUMAR SINGH |
| 311132120012 | AAYUSHI KUMARI |
| 311132120013 | ANANYA KUMARI |
| 311132120014 | ANKIT KANT |
| 311132120015 | KUMAR RAVI |
| 311132120016 | ROHIT KUMAR PANDEY |
| 311132120017 | SALMAN ALAM |
| 311132120018 | ROHIT KUMAR BHARTI |
| 311132120019 | NIKKI KUMARI |
| 311132120020 | SONU KUMAR SINGH |
| 311132120021 | MD. ARMANUL HAQUE |
| 311132120022 | DEEP KUMAR |
| 311132120023 | GAJENDRA KUMAR SINGH |
| 311132120024 | SUBHAM KUMAR |
| 311132120025 | UTSAV KUMAR TIWARI |
| 311132120026 | SHAJZAD KHAN |
| 311132120027 | SAMIR KUMAR |
| 311132120028 | PAWAN KUMAR |
| 311132120029 | CHANDAN KUMAR |
| 311132120030 | ADITYA KUMAR |
| 311132120031 | RANI KUMARI |
| 311132120032 | DIWAKAR KUMAR |
| 311132120033 | ADITYA KUMAR BHAGAT |
| 311132120034 | BHIM MANJHI |

|  |  |
| --- | --- |
| 311132120035 | AMAN KUMAR RAM |
| 311132120036 | VISHAL KUMAR GAURAV |
| 311132120037 | VIKASH KUMAR |
| 311132120038 | SUMIT KUMAR SHARMA |
| 311132120039 | AKRAR AHMAD |
| 311132120040 | KRISHNA KUMAR SHARMA |
| 311132120042 | GITANJALI KUMARI |
| 311132120043 | AMIT KUMAR |
| 311132120044 | NITISH KUMAR |
| 311132120045 | NIRANJAN KUMAR |
| 311132120046 | RISHABH KUMAR |
| 311132120047 | JAGMOHAN KUMAR |
| 311132120049 | ABHISHEK KUMAR |
| 311132120050 | SONIKA KUMARI |
| 311132120052 | MD IMTIYAZ |
| 311132120053 | MUNMUN KUMAR |
| 311132120054 | PRADUM KUMAR |
| 311132120301 | MAMTA KUMARI |
| **601/EC/21** | **CHANDAN KUMAR VIDYARTHI** |
| **602/EC/21** | **DIPAK KUMAR** |
| **603/EC/21** | **SURAJ KUMAR** |
| **604/EC/21** | **RAUSHAN KUMAR** |
| **605/EC/21** | **NITISH KUMAR** |
| **606/EC/21** | **AASTHA PRIYA** |
| **607/EC/21** | **RAM PRAKASH SHAH** |
| **608/EC/21** | **ADITYA KUMAR MAURYA** |
| **609/EC/21** | **SATYAM JEE** |
| **610/EC/21** | **MANTU KUMAR PAL** |
| **611/EC/21** | **SANOJ KUMAR PRASAD** |
| **612/EC/21** | **SUNNY KUMAR** |

**LECTURE PLAN**

|  |  |
| --- | --- |
| **Topics** | **Lecture Number** |
| **Audio Fundamentals and Devices:** | **01-12** |
| Basic characteristics of sound signal | 1-2 |
| Audio level metering | 3-4 |
| Decibel level in acoustic measurement | 5 |
| Microphone & Types | 6-7 |
| Speaker types & working principle | 8 |
| Speakers working principle | 9-10 |
| Sound recording principle & types | 11-12 |
| **Audio Systems:** | **13-24** |
| CD player | 13 |
| Home theatre sound system | 14 |
| Surround sound | 15-16 |
| Digital console block diagram | 17-18 |
| Working principle and its applications | 19-20 |
| FM tuner | 21 |
| ICs used in FM tuner TDA 7021T | 22-23 |
| PA address system | 24 |
| **Television Systems:** | **25-38** |
| Monochrome TV standards | 25 |
| Scanning process | 26 |
| Aspect ratio, Persistence of vision and Flicker | 27-28 |
| Interlace scanning | 29 |
| Picture resolution, Composite video signal | 30-31 |
| Colour TV standards | 32 |
| Colour theory, Hue, Brightness, Saturation | 33-34 |
| Luminance and chrominance | 35 |
| Different types of TV camera | 36-37 |
| Transmission standards | 38 |
| **Television Receivers and Video Systems:** | **38-50** |
| PAL-D colour TV receiver | 38-39 |
| Digital TVs:- LCD, LED , PLASMA, HDTV, 3- D TV, projection TV | 40-43 |
| DTH receiver | 43 |
| Video interface | 44 |
| Digital Video | 45 |
| SDI, HDMI Multimedia Interface | 46-47 |
| Digital Video Interface | 48 |
| CD and DVD player | 49-50 |
| **Home / Office Appliances:** | **51-60** |
| Diagrams, operating principles and controller for FAX and Photocopier | 51-52 |
| Microwave Oven | 53-54 |
| Washing Machine | 55-56 |
| Air conditioner and Refrigerators | 57-58 |
| Digital camera and camcoder | 59-60 |

**This document is approved by**

|  |  |  |
| --- | --- | --- |
| **Designation** | **Name** | **Signature** |
| Course Coordinator | Prof. Saurav Kumar |  |
| HoD | Prof. Om Prakash Aditya |  |
| Principal | Dr.Anil Kumar Singh |  |
| Date |  |  |