**LESSON PLAN**

**NAME OF THE FACULTY: - Sh. Devender singh**

**DISCIPLINE: - ECE**

**SEMESTER:- 4th**

**SUBJECT—Medical Electronics**

**Lesson Plan Duration:- 15 weeks (Jan-2019 to April-2019)**

**Work Load (Lecture/Practical) per week (In hours): Lecture- 03, Practical -03**

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| **Week** | **Theory** | **Practical** |
|  | **Lecture Day** | **Topic (Including assignment/test)**  | **Practical** | **Topic** |
| 1st | 1st | Overview of Medical Electronics | 1st (G1) | To operate and familiarization with B.P. Apparatus |
| 2nd | classification of medical Equipments |
| 1ST (G2) | To operate and familiarization with B.P. Apparatus |
| 3rd | application and specifications of diagnostic |
| 2nd | 4th | therapeutic and clinical laboratory equipment | 1st (G1) | To operate and familiarization with ECG Machine |
| 5th | method of operation of these instruments |
| 1st (G2) | To operate and familiarization with ECG Machine |
| 6th | typical waveforms & signal characteristics |
| 3rd  | 7th | Revision of Unit 1 | 2nd (G1) | To operate and familiarization with Ventilator |
| 8th | Introduction to Electrodes |
| 9th | Origin of Bioelectric signals |
| 4th  | 10th | Bio electrodes, Electrode tissue interface | 2nd (G2) | To operate and familiarization with Ventilator |
| 11th | contact impedance |
| 12th | Types of Electrodes |
|   | 13th | Biological Amplifiers | 2nd (G1) | To operate and familiarization with Incubator |
| 14th | Electrodes used for ECG , EEG, EMG |
| 2nd (G2) | To operate and faomiliarization with Incubator |
| 15th | Revision of Unit 2 |
| 6th | 16th | Bio Transducers & Biosensors | 3rd (G1) | To measure the concentration of blood sugar with Glucometer (fasting, P.P., Random) |
| 17th | Typical signals from physiological parameters |
| 3rd (G2) |  To measure the concentration of blood sugar with Glucometer (fasting, P.P., Random |
| 18th | Classification of Bio transducers |
| 7th  | 19th | pressure transducer, Photoelectric transducer | 4th (G1) | To measurea) Respiration rate and interface to PCb) Pulse rate |
| 20th | Transducer for body temperature measurement | 4th (G2) |  To measurea) Respiration rate and interface to PCb) Pulse rate |
| 21 | pulse sensor, respiration sensor |
| 8th  | 22 | Revision of Unit 3 |   5th (G1) | To Measure The EMG Signals and interface with PC |
| 23 | Bio Medical Recorders |
| 24 | Block diagram description and application of ECG |
| 5th (G2) | To Measure The EMG Signals and interface with PC |
| 9th  | 25 | Block diagram description and application of EMG | 6th (G1) | Body Temperature measurement and recording in excel form in pc |
| 26 | Block diagram description and application of EEG |
| 6th (G2) | Body Temperature measurement and recording in excel form in pc |
| 27 | Block diagram description and application of PCG |
| 10th  | 28 | Block diagram description and application of VCG | 7th (G1) | To study the Body positions and interfacing of body position sensor and data recording |
| 29 | Block diagram description and  |
| application of Digital Stethoscope | 7th  (G2)  | To study the Body positions and interfacing of body position sensor and data recording |
| 30 | Revision of Unit 4 |
| 11th  | 31 | Patient Monitoring Systems | 8th (G1) | Installation of small medical equipment in laboratories of Hospital precautions to be taken |
| 32 | Heart rate measurement |
| 33 | Pulse rate measurement |
| 12th  | 34 | Respiration rate measurement | 8th (G2)  | Installation of small medical equipment in laboratories of Hospital precautions to be taken |
| 35 | Blood pressure measurement | 9th (G1) | Study of large medical equipment in Hospital / Nursing home |
| 36 | Need of defibrillator and Cardiac Pace maker | 9th (G2) | Study of large medical equipment in Hospital / Nursing home |
| 10th (G1) |  Operation and use of Electro-physiotherapy |
| 13th  | 37 | Bedside patient monitoring System | 10th (G2) | Operation and use of Electro-physiotherapy |
| 38 | Modern Imaging System | 11th (G1) |  Maintenance schedule for different equipment and their records in a hospital |
| 11th (G2) | Maintenance schedule for different equipment and their records in a hospital |
| 39 | X-Ray Machine | 12th (G1) | Getting body parameters from Bluetooth to android App and PC |
| 12th (G1) | Getting body parameters from Bluetooth to android App and PC  |
| 14th  | 40 | Magnetic Resonance Imaging System | 13th (G1) | Creating body Area network using Zigbee devices |
| 13th (G2) |  Creating body Area network using Zigbee devices |
| 41 | Ultrasonic Imaging System | 14th (G1) | Logging of various body parameters in SD card as excel format |
| 14th (G2) | Logging of various body parameters in SD card as excel format |
| 42 | Electric shock hazards |  Viva of practical no. 1 to 8 |
| 15th  | 43 | Leakage currents, Electrical safety analyse ,  |  | Viva of practical no. 9 to 16 |
| 44 | Safety standards |  | Revision of practicals |
| 45 | Revision of whole syllabus |  |  Revision of practicals |