**KURUKSHETRA UNIVERSITY KURUKSHETRA**

**Revised Scheme of Examinations & Syllabus for B.Sc. Non-Medical Programme for the subject of Electronic Equipment Maintenance under Choice Based Credit System (CBCS-LOCF)**

**V & VI Semesters w.e.f. 2022-23**

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Sem** | **Course** | **Paper Code** | **Nomenclature** | **Credits** | **Workload/Hrs/week** | **Exam. Duration**  **(Hrs)** | **Internal Marks** | **External Marks** | **Total**  **Marks** |
| **Max.** | **Max.** |  |
| 5 | \*\*DSE-EEM-5 | DSE-EEM-501  (ELECTIVE-I) | Electronic Instrumentation | 2 | 2 | 3 | 10 | 40 | 50 |
| Computer Hardware & Maintenance-I |
| DSE-EEM-502  (ELECTIVE-II) | Consumer Electronics | 2 | 2 | 3 | 10 | 40 | 50 |
| Transducers and Sensors |
|  | EEM-503 | Major Project | 2 | 4 | 3 | 10 | 40 | 50 |
|  | SEC-EEM-504 | Basic Electrical Engineering Skills | 2 | 2 | 3 | 10 | 40 | 50 |
|  | **TOTAL** | | | **08** | **10** | **-** | **40** | **160** | **200** |
| 6 | \*\*DSE-EEM -6 | DSE-EEM-601  (ELECTIVE-III) | Electronic Equip. Maintenance | 2 | 2 | 3 | 10 | 40 | 50 |
| Computer Hardware & Maintenance-II |
| DSE-EEM-602  (ELECTIVE-IV) | Biomedical Equip. Maintenance | 2 | 2 | 3 | 10 | 40 | 50 |
| Embedded Systems & Robotics |
|  | EEM -603 | Practical | 2 | 4 | 3 | 10 | 40 | 50 |
|  | **TOTAL** | | | **06** | **08** | **-** | **30** | **120** | **150** |

**\*\* DSE (Discipline Specific Elective).**

**Important Instructions:-**

1. A student can opt for one paper out of the list of elective papers provided against each paper code for respective semester.
2. One credit equivalent to 1 hour of teaching/2 hours of Practical work.
3. One credit equivalent to 25 marks.
4. Teaching workload will be calculated on the basis of teaching contact hours of the course.
5. The Practical examination will be held at the end of odd and even semester in one session of three hours duration.
6. For Practical/Project work, a maximum of 15 students are allowed in one group during course of study and also in Examination.
7. During Practical Examination, a candidate is required to perform one experiment from the prescribed list of experiments.
8. Distribution of Marks in Practical Examination B.Sc. I, II, III, IV & VI Semester):
9. Internal Marks: 10
10. Experiment Performed: 15

II. Lab Record: 10

IV. Viva/Voce : 15

1. Distribution of Marks in Major Project (Paper EEM-503) of B.Sc. V Semester:
2. Internal Marks: 10
3. Project Developed: 15

II. Project Report: 10

III. Viva Voce: 15

**Semester-V**

**Course: B.Sc.**

**Subject: Electronic Equipment & Maintenance**

**Paper No: SEC-EEM-504**

**Nomenclature: Basic Electrical Engineering Skills**

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| Programme | Course Credit | Theory Hours per week | Internal Assessment Marks | External Examination  Marks | Maximum Marks | End Term Examination Time |
| B.Sc. | 2 | 2 | 10 | 40 | 50 | 3 Hours |

**Course Objective:** The objectives of teaching this paper are

1. To make the student familiar with ac fundamental, A.C. circuits & electrical installations.
2. To make the students familiar with balanced three phase systems and concept of magnetic.
3. To acquaint the students with the single phase transformer and electrical machines.

**Course Outcome**: After the end of this paper, the students will be able

1. To understand the basic fundamentals of electrical& electrical installations.

2. To analyze the different types of ac circuits & magnetic circuits.

3. To understand the concepts of three phase systems and electrical installations.

**Mapping of Course Outcomes to Program Outcomes:**

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| ***CO’s*** | **PO1** | **PO2** | **PO3** | **PO4** | **PO5** | **PO6** | **PO7** | **PO8** | **PO9** | **PO10** | **PO11** | **PSO1** | **PSO2** | **PSO3** |
| **CO1** | 3 | 3 | 2 | 3 | 3 | 3 | 3 | -- | -- | -- | 3 | 3 | 3 | 2 |
| **CO2** | 3 | 3 | 2 | 3 | 3 | 3 | 3 | -- | -- | -- | 3 | 3 | 3 | 2 |
| **CO3** | 3 | 3 | 2 | 3 | 3 | 3 | 3 | -- | -- | -- | 3 | 3 | 3 | 2 |

**Unit-I**

**AC Fundamentals:**Sinusoidal periodic voltage/current signal, instantaneous and peak values, polar & rectangular form of representation of impedances and phasor quantities. Addition & subtraction of two or more phasors/ AC signals using component resolution method.

RMS and average values of general, full wave and half wave rectified sinusoidal wave.

**Unit-II**

**Electrical Installations:** Introduction to various repairing tools, electronic material/elements, electrical materials, their symbols and abbreviations.

Basic idea of Fuse, Switch Fuse Unit (SFU), MCB, ELCB, MCCB, Earthing, Solid and stranded cable. Conduit. Cable trays. Basic idea regarding Electric shock and hazards, Shock protection and first aid treatment. Circuit and working of UPS and home inverter with wiring.

**Unit-III**

**Concept of magnetic circuits:**Fleming’s RH &LH Rule, RH Screw rule, Relation between MMF & Reluctance. Hysteresis& Eddy current phenomenon.

**Single Phase Transformer**(qualitative analysis only): Basic Principle, construction & Phasor diagram at ideal, no load and on resistive load practical conditions. Types of Losses in transformers.

**Unit-IV**

**Balanced Three Phase Systems(**qualitative analysis only)**:**  Generation of alternating 3- phase emf. Advantages of 3 phase over single phase power system, 3-phase balanced circuits and neutral point, derivation of voltage relations and current relations in star and delta connections.

**Electrical Machines:** Principles of generating and motoring. Generation of single phase AC (working of single coil dynamo with slip rings), Necessity of motor starter.

**Reference Books:**

* + - 1. Basic Electrical Engg.by S.K. Sahdev, Pearson Education(Text).

2. Electrical Engg. Fundamentals by Rajendra Prasad, PHI Pub.

3. Electrical Engg. Fundamentals: by Bobrow, Oxford Univ. Press.

4. A textbook on Power System Engg. by Chakrabarty, Soni & Gupta by Dhanpat Rai & Co. Pub.