**University of Central Punjab**

**Faculty of Information Technology**



**BSCS/BSSE**

**PROGRAM (S) TO BE**

**EVALUATED**

1. **Course Description**

(Fill out the following table for each course in your computer science curriculum. A filled-out form should not be more than 2-3 pages.)

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| --- | --- | --- | --- | --- |
| **Course Code** | CSCS1723 | | | |
| **Course Title** | Basic Electronics | | | |
| **Credit Hours** | 3 (3 + 0) | | | |
| **Prerequisites by Course(s) and Topics** | N/A | | | |
| **Assessment Instruments with Weights** (homework, quizzes, midterms, final, programming assignments, lab work, etc.) | Quiz 15%,  Assignment 15%  Lab 10%  Midterm 20%  Final 40% | | | |
| **Semester** | Fall 2021 | | | |
| **Course Instructor** |  | | | |
| **Course Instructor Email** |  | | | |
| **Course Coordinator** |  | | | |
| **Office Hours** | Will be decided | | | |
| **Plagiarism Policy** | All the Groups involved will be awarded Zero in first instance. Repeat of the same offense will result in (F) grade. Marks will be uploaded on portal and can be contested within a week or would be considered final. | | | |
| **Current Catalog Description** | This course covers essential hardware topics at the device and circuit level. Topics include: (1) Introduction to Electricity, Electronics, Electrical components, quantities, units and measuring instruments. (2) Basic concepts of current, voltage, resistance, Energy and power in electric circuits, (3) Series and parallel resistances, effects of current and voltage in case of series and parallel resistances, (4) Kirchhoff’s voltage law and voltage divider. (5) Kirchhoff’s current law and current divider, (6) Introduction to sinusoidal wave forms, Half wave, Full Wave Rectification (7) Special purpose diodes and Diode applications, Half Wave and Full Wave. (8) Introduction to BJT’s, Modes of operation of BJT’s. | | | |
| **Textbook** (or **Laboratory Manual** for Laboratory Courses) | Principles of Electric circuits by Thomas. L. Floyd 9th edition | | | |
| **Reference Material** | Electronic devices by Thomas. L. Floyd 9th edition | | | |
| **Course Goals** | * After completion of this course the students will be able to understand the basic principles of electricity and role of Resistive and Capacitive circuits in Series and parallel formation. This course will help them to analyze current when passing through a circuit and its correlation with potential difference. * Students will be familiar with the basic rules and principles of electronics like Ohm’s Law, Kirchhoff’s voltage and current law, voltage and current divider formations, and basic application of transistors and diodes. | | | |
| **Topics Covered in the Course, with Number of Lectures on Each Topic** (assume 15-week instruction) | Attached | | | |
| **Programming Assignments Done in the Course** | No | | | |
| **Class Time Spent on** (in credit hours) | **Theory** | **Problem Analysis** | **Solution Design** | **Social and Ethical Issues** |
| 2 | 0.5 | 0.5 |  |
| **Oral and Written Communications** | Different topics are given to the students related to different fields of Basic Electronics. Presentation is expected at the end of the term on these assigned topics which enhances oral and written skills of students. | | | |

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| **LECTURES** | **Lecture Topics** |  | **Instruments** |
| **Lec#1:** | Introduction to Electricity, Electronics, importance and application in CS, physical quantities, units. | Principles of electric circuits by Floyd |  |
| **Lec#2:** | Conductors, Insulators, Semiconductors. Difference in light of Band theory. | Electronic Devices by Floyd |  |
| **Lec#3:** | Voltage, Current, Resistance and Resistor color coding. | Principles of electric circuits by Floyd |  |
| **Lec#4:** | Measuring instruments Analog and Digital (Voltmeter, Ohmmeter, Ammeter). | Principles of electric circuits by Floyd | Quiz 01 |
| **Lec#5** | Practical measurement of Current, voltage and Resistance using DMM |  |  |
| **Lec#6:** | Power, Energy, Ohm’s law. | Principles of electric circuits by Floyd | Quiz 1 |
| **Lec#7:** | Practical verification of Ohms law |  |  |
| **Lec#8:** | Series combinations of Resistors, Ohm’s law in series circuit for ideal voltage and current sources. (voltage, current, power calculation) | Principles of electric circuits by Floyd | Assignment 1 |
| **Lec#9** | Practical verification of series circuit |  |  |
| **Lec#10:** | Parallel combination of Resistors, Ohm’s law in parallel circuit for ideal voltage and current sources. | Principles of electric circuits by Floyd | Quiz 2 |
| **Lec#11:** | Voltage, current, power calculations in Series and Parallel | Principles of electric circuits by Floyd |  |
| **Lec#12** | Practical verification of parallel circuit |  |  |
| **Lec#13:** | Series and Parallel Resistive circuits | Principles of electric circuits by Floyd |  |
| **Lec#14** | Practical verification of Series parallel circuit |  | Quiz 3 |
| **Lec#15:** | Kirchhoff’s voltage and Current law | Principles of electric circuits by Floyd |  |
| **Lec#16:** | Revision |  |  |
| **MID TERM** | | | |
| **Lec#17:** | Introduction to diodes, commonly used Types (PN junction diode, Zener, LED) | Electronic Devices by Floyd |  |
| **Lec#18:** | Practical demonstration of LED and Diode/LED |  |  |
| **Lec#19:** | Practical demonstration AND and OR gate using Diode |  | Quiz 4 |
| **Lec#20** | IV characteristic curve of PN and Zener diodes. | Electronic Devices by Floyd |  |
| **Lec#21:** | VI curve verification of LED practically |  |  |
| **Lec#22:** | Introduction to sinusoidal waveforms (Time period, frequency, amplitude), Vp, VPP, Vrms, Vavg | Principles of electric circuits by Floyd | Quiz 5 |
| **Lec#23** | Basics of Half wave  Full wave and Bridge rectification. | Electronic Devices by Floyd |  |
| **Lec#24:** | Half wave practical demonstration |  |  |
| **Lec#25:** | full wave practical demonstration |  |  |
| **Lec#26:** | Introduction to Zener diode, VI curve | Electronic Devices by Floyd |  |
| **Lec#27:** | Practical demonstration of Zener diode |  |  |
| **Lec#28** | BJT | Electronic Devices | Assignment 2 |
| **Lec#29:** | Transistors as switch, Transistor as an amplifier (Introduction) | Electronic Devices |  |
| **Lec#30:** | Practical demonstration of transistor as a switch | Electronic Devices | Quiz 6 |
| **Lec#31:** | Practical demonstration of NOT, NAND and NOR gate using transistor | Electronic Devices by Floyd |  |
| **Lec#32:** | Revision |  |  |