Purbanchal University

Faculty of Engineering, Biratnagar, Nepal
Syllabus

Level: Bachelor

Program: Bachelor in Civil Engineering

Subject: BASIC ELECTRONICS ENGINEERING
Subject Code: BEC----

Year: II   **Semester: III**

Teaching Schedule Hours/Week					Examination Schedule						Total Marks
					Final				Internal Assessment		
					Theory		Practical		Theory Marks	Practical Marks	
Credit Hours	L	T	P	Total	Duration	Marks	Duration	Marks	20	25	75
2	2	1	2/2	4	1.5 Hrs.	30	-	-			

Note: **L:** Lecture   **T:** Tutorial   **P:** Practical

Course Objective: To familiarize the students of Civil Engineering with basic concept of electronic devices.

1. **Introduction**   (1 Hrs)
    1.1 Introduction to Basic Electronics
    1.2 Use of Basic Electronics in Civil Engineering

2. **Diodes**   (6 Hrs)
    2.1 PN junction diode, characteristics of PN junction diode
    2.2 Zener diode, LED, Photodiodes, Schottky diode and their applications
    2.3 Unregulated and regulated: DC power supply
    2.4 Half wave and full wave Rectifier

3. **Transistor**   (6 Hours)
    3.1 BJT and FET: operation and configuration
    3.2 BJT as amplifier and switch
    3.3 FET: Operation, Types and Configuration
    3.4 FET as an amplifier

4. **Logic gates**   (4Hrs)
    4.1 Basic gates (AND, OR, NOT)

4.2   Derived gates and Universal gates

4.3   Applications

5.   Transducer and application   (9 Hrs)

5.1   Physical Variables

5.2   Definition of transducer

5.3   Types (Strain gauge, LVDT, Ultrasonicsensor, Accelerometer, Tachometer, LASER devices, Total station)

5.4   Errors in measurement

6.   Operational Amplifier   (4 Hrs)

6.1   Basic Model, Ideal and non-ideal characteristics

6.2   Inverting and non-inverting modes

6.3   Adder and Subtractor

Practicals:
1. VI characteristics of PN junction diode
2. Half wave and full wave rectifier with and without filter capacitor
3. Observe the output of op-amp in inverting and non-inverting configuration
4. Observe the output of LVDT

References:
1. Theodorre S. Bogart, "Electronic Devices and Circuits"
2. Robert Boyelstad, " Electronic Devices and Circuits"
3. A.S. Sedra and K.C. Smith, "Microelectronic Circuits", 6th Edition, Oxford University Press
4. J.B. Gupta, "Electronic Devices and Circuits"

Final Examination Scheme:

Chapters	Hours	Marks	Remarks
1	1	2	
2	6	6	
3	6	6	
4	4	4	
5	8	8	
6	5	4	
Total	30	30	
			Note: There might be minor deviation in mark distribution. *Mandatory: Marks should be evaluated based on solving steps.*

Evaluation Scheme;

Marks Division

Question Type	No. of Questions	Marks	Total Marks
Short	2	2	4
Medium	4	4	16
Long	2	5	10
Total			30

Question pattern:

Chapter	Hours	Marks
1.	8	8
2	8	6
3	4	4
4	5	6
5	5	6