SAMRAT ASHOK TECHNOLOGICAL INSTITUTE
(Engineering College), VIDISHA M.P.

(An Autonomous Institute Affiliated to RGPV Bhopal)

Department of Electronics Engineering

Syllabus applicable to July 2022 admitted and later batches

Name of the course:	B. Tech in Electronics & Communication Engineering
Semester and Year of study	B. Tech 1st Year 1st Semester
Subject Category	Engineering Science Course (ESC)
Subject Code: ECA101	Subject Name: Basic Electronics

Maximum Marks Allotted								Contact Hours			Total Credits
Theory				Practical			**Total Marks**				
End Sem	Mid-Sem	Assignment	Quiz	End Sem	Lab-Work	Quiz		L	T	P	
60	20	10	10	30	10	10	150	3	0	2	4

Prerequisites:

Fundamentals of Physics

Course Objective:

1. The course intends to provide an overview of the principles, operation and application of the analog building blocks like diodes, BJT etc. for performing various functions.
2. This course relies on elementary treatment and qualitative analysis and makes use of simple models and equation to illustrate the concepts involved.
3. To provide an overview of amplifiers.
4. Sufficient knowledge is provided so that students will be able to use this course as the basis for other advanced courses like Analog Circuits and Linear IC's, Power Electronics etc.
5. Continue to enhance oral and written communication skills specifically directed to the practice of electronics engineering.

Course Outcomes:

After completion of this course students will be able to

CO1: Acquire knowledge of semiconductor devices and their working mechanism.

CO2: Analyze various electronic circuit configuration.

CO3: Analyze the circuit characteristics and compute its parameters.

CO4: Design various electronic circuits.

UNITs	Descriptions	Hrs.	CO's
I	Semiconductor diodes: Introduction to PN junction diode, Zener diode and its applications, Rectifiers, Regulators, Clipping and Clamping circuits, Tunnel diode, Schottky diode, Varactor diode and their applications, Optoelectronic devices: PIN diode, Light Emitting Diode (LED), Laser diode.	8	CO1, CO4
II	Bipolar Junction Transistors (BJTs): Physical structure and operation modes, Transistor as an amplifier, Basic BJT amplifier configuration: common emitter, common base and common collector amplifiers, Biasing the BJT: fixed bias, emitter feedback bias, collector feedback bias and voltage divider bias, D.C. analysis of transistor circuits, load line and Q point, Transistor as a switch: cut-off and saturation modes.	10	CO2, CO4
III	AC Analysis of BJT: Transistor Model: r_e Model, h-parameter model, Small Signal Analysis, BJT Frequency Response.	12	CO3
IV	Multistage Amplifiers: Multistage or Cascade amplifier: classification of multi-stage amplifier, coupling and frequency response of cascaded systems, effect of cascading on voltage gain, current gain, phase, input and output impedances and bandwidth of cascaded or multistage amplifiers. Types of coupling, cascade and cascode circuits, Miller	8	CO2

	theorem, Darlington pair, bootstrap circuit.		
V	Tuned Amplifiers: Single tuned, double tuned and stagger tuned amplifiers characteristics and their frequency response. Power amplifier: Class A large signal amplifiers, second-harmonic distortion, Transformer coupled audio power amplifier, Class B amplifier, Class AB operation push pull and Class C power amplifiers. Comparison of their efficiencies, types of distortion.	7	CO2
Guest Lectures (if any)		Nil	
Total Hours		45	

Suggestive list of experiments:

1. To draw the forward and reverse bias characteristics of a semiconductor PN junction diode.
2. To draw the characteristics of Zener diode as a voltage regulator. (CO1)
3. To observe the waveform of Clamper circuit. (CO1)
4. To observe the waveform of Clipper circuit. (CO1)
5. To observe the output waveform of Half wave rectifier. Calculate its parameters like PIV, Ripple Factor, Form Factor and Efficiency. (CO1)
6. To observe the output waveform of Full wave rectifier. Calculate PIV, Ripple Factor, Form Factor and Efficiency. (CO1)
7. To plot common base input and output characteristics for PNP bipolar junction transistor. (CO2)
8. To plot common emitter input and output characteristics for NPN bipolar junction transistor. (CO2)
9. To design a positive clipper circuit using a 1 kHz square wave with a 10 volt peak-to-peak magnitude as the input signal. (CO4)
10. To design a negative clamper circuit using a 1 kHz square wave with a 10 volt peak-to-peak magnitude as the input signal. (CO4)
11. To draw the frequency response of two stage RC coupled class A amplifier using transistor. (CO2)
12. To draw the frequency response of two stage Direct coupled class A amplifier using transistor. (CO2)

Text Book-

1. Integrated Electronics - Millman Halkias, TMH
2. Electronic Devices & Circuits – Boyelstad & Nashelsky – PHI
3. Electronic Devices & Circuits – David A. Bell – PHI
4. Principles of Electronic Devices – Malvino TMH

Reference Books-

1. Microelectronic Circuits- Sedra, Smith.
2. Electronics Circuits And Systems- Owen Bishop
3. Intuitive Analog Circuit Design- Marc T. Thompson
4. Starting Electronics (Fourth Edition)-Keith Brindley

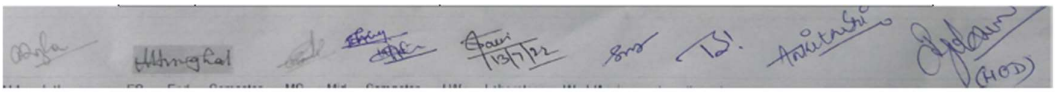
List and Links of e-learning resources:

1. https://nptel.ac.in/courses/117103063/
2. https://www.electronics-tutorials.ws/

Modes of Evaluation and Rubric

The evaluation modes consist of performance in Two mid-semester Tests, Quiz/ Assignments, lab work, end-semester examinations, and end-semester practical examinations.

Recommendation by Board of studies on	15.06.2022
Approval by Academic council on	
Compiled and designed by	



SAMRAT ASHOK TECHNOLOGICAL INSTITUTE
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Computer Science and Engineering

Semester/Year			Program		B.Tech.
Subject Category	ESC	Subject Code:	ITC101	Subject Name:	Python Programming

Maximum Marks Allotted								Contact Hours			Total Credits
Theory				Practical			Total Marks				
End Sem	Mid-Sem	Assignment	Quiz	End Sem	Lab-Work	Quiz		L	T	P	
60	20	10	10	30	10	10	150	3	0	2	4

Prerequisites:

- High School Level Mathematics
- Elementary Knowledge of Computer

Course Objective:

This course introduces core programming basics—including data types, control structures, algorithm development, and program design with functions via the Python programming language. The course discusses the fundamental principles of Object-Oriented Programming.

Course Outcomes:

Upon completion of this course, the student will be able to:

CO-1: Ability to install python and its different packages.
CO-2: Implement solution logic of problem and draw it in the form of algorithm.
CO-3: Design and write a python program for given algorithm.
CO-4: Understand and apply the list logics to problem solution.
CO-5: Understand Object Oriented with reference to python programming.

UNITs	Descriptions	Hrs.	CO's
I	Introduction to computer science, algorithms, data representation in computers, hardware, software and operating system. Installation of python- interactive shell, IDLE, saving, editing, and running a script. The concepts of datatypes: variables, immutable variables, numerical types, operators, expressions, Indentation and comments in the program.	8	CO1
II	Conditional Statements- Conditions, Boolean Logic, Logical operators and Ranges. Control Statements- Break, Continue and Pass. Flow Control-if, if-else, nested if-else, Loop statements- for loop, while loop, Nested loops.	8	CO2
III	String: subscript operator, indexing, slicing a string; strings and number system: converting strings to numbers and vice versa. Strings and text files, manipulating files and directories, os and sys modules, text files: reading/writing text and numbers from/to a file, creating and reading a formatted file (csv or tab-separated).	9	CO3
IV	Lists, tuples, and dictionaries. Basic list operators, replacing, inserting, removing an element, searching and sorting lists, dictionary literals, adding and removing keys, accessing and replacing values, traversing dictionaries.	7	CO4
V	Classes and OOP: Classes, objects, attributes and methods, defining classes, design with classes, Inheritance, Overloading, Overriding, and Data hiding. Exception: Exception Handling, except clause, Try finally clause, User Defined Exceptions.	8	CO5
Guest Lectures (if any)		--	
Total Hours		40	

List of Experiments

1. Write a program in python to check a number whether it is prime or not.
2. Write a program to check a number whether it is palindrome or not.
3. Write a function to swap the values of two variables through a function.

Dr. Kanak Saxena
Chairperson

4. Write a python program to Read a file line by line and print it.
5. Write a program to display the number of lines in the file and size of a file in bytes.
6. Write a program to calculate the factorial of an integer using recursion.
7. Write a program to print Fibonacci series using recursion.
8. Write a program for binary search.
9. Python Program for Sum of squares of first n natural numbers.
10. Python Program to find sum of array.
11. Python program to read character by character from a file.
12. Python Program to print with your own font.
13. Python program to print even length words in a string.
14. Python program to check if a string is palindrome or not.
15. Program to print ASCII Value of a character.
16. Python program to find smallest and largest number in a list.
17. Python program to find the size of a Tuple.

Text Books-

- M. Mano, "Digital Logic and Computer Design", Pearson Education.
- T. L. Floyd, “Digital Fundamentals”, Pearson Education.
- A. Anand Kumar, “Fundamentals of Digital Circuits”, PHI.

Modes of Evaluation and Rubric

The evaluation modes consist of performance in Two mid-semester Tests, Quiz/ Assignments, term work, end-semester examinations, and end-semester practical examinations.

List/Links of e-learning resource

List and Links of e-learning resources:

4. https://nptel.ac.in/courses/108/105/108105132/
5. https://de-iitr.vlabs.ac.in/

Recommendation by Board of studies on	June-2022
Approval by Academic council on	June-2022
Compiled and designed by	CS & IT
Subject handled by department	CS & IT

Dr. Kanak Saxena
Chairperson

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Department of Electrical and Electronics Engineering
Syllabus applicable to July 2022 admitted and later batches

Name of the course:	B. Tech in Electronics & Communication Engineering
Semester and Year of study	B. Tech 1st Year 1st Semester
Subject Category	ESC
SubjectCode:ECA104	Subject Name: Fundamentals of Instrumentation

Maximum Marks Allotted						Contact Hours			Total Credits
Theory			Practical		**Total Marks**				
End Sem	Mid-Sem	Quiz	End Sem	Lab-Work		L	T	P	
60	20	20	-	-	100	3	-	-	3

Prerequisites:

Basic Electrical Concepts, Mathematics (Matrices, Laplace Transform, Differential Equations and Complex Variables).

Course Objective:

The course aims at providing the fundamental concepts of the Instrumentation and Measurement, static and dynamic characteristics of instruments and their error analysis, provides an overview of the laboratory instruments such as CRO, function generators, multimeters etc. It also includes the measurement of passive electrical elements like R, L,C.

Course Outcomes:

Upon completion of the course, student will be able to

- CO1: Identify, conceptualize, demonstrate and apply the fundamentals of measurement science, measuring instruments and their characteristics.
- CO2: Investigate and analyze the working of electrical measuring instruments.
- CO3: Analyze the working of Cathode Ray Oscilloscope (CRO) and other laboratory equipments.
- CO4: Analyze DC bridges used for measurement of Resistance.
- CO5: Analyze AC bridges used for measurement of Capacitance and Inductance.

UNITs	Descriptions	Hrs.	CO's
I	**Basic concept of Instrumentation**: Classification of measuring instruments, Definitions Accuracy and Precision, Static and Dynamic characteristics of the instruments, Statistical Analysis, Types of Errors. Probability of Errors, Limiting Errors, Uncertainty Analysis.	12	CO1
II	**Analog Instruments:** Classification of analog instruments, D' Arsonval type Galvanometer, Principle of operation and construction of various analog instruments, extension of ranges and calibration of ammeters & voltmeters. **Digital Instruments:** Digital Frequency Meter, Period Measurement, Time Interval Measurements, Resolution. Sensitivity and Accuracy in Digital Meter, Digital L, C And R Measurements, Digital LCR Meter.	10	CO3
III	**Laboratory Instruments**: Introduction, Oscilloscope Block Diagram, Cathode Ray Tube Block Diagram of DSO, Its Principle and Working, Advantages and Applications. Special Oscilloscope. Sine Wave Generator, Function Generators, Spectrum Analyzers, Harmonic Distortion Measurement, Digital Multimeter, Digital frequency meter.	08	CO2
IV	**Display Devices :** Digital Display Units, Segmental Displays, Dot Matrices, Light Emitting Diode, Liquid Crystal Diodes, Segmental Gas Discharge Displays, Decade Counting Assembly's, Display	08	CO4

	Systems, Decimal Decoders, BCD To 7-Segment Converter, BCD To Dot Matrix Converter, Sensitivity of Digital Meters, Accuracy Specification of Digital Multi meters.		
V	**Measurement of Resistance, Inductance and Capacitance:** Wheatstone bridge, Kelvin bridge, Various application of DC bridges, Ohmmeter, **A. C. Bridges:** Maxwell's bridge, Hay's Bridge, Schering bridge, Wien's Bridge, Wagner earthling device **Transducers:** Strain gauges, LVDT, Temperature transducer, capacitive transducer, pressure transducer, load cell, Piezo electric transducer, photo electric transducer, photovoltaic cell.	07	CO4
Guest Lectures (if any)		Nil	
Total Hours		45	

Suggestive list of experiments:

Text Books -

1. Cooper W.D., Helfrick A.D. "Modern Electronic Instrumentation Measurement", Prentice Hall.
2. Sawhney A.K. "Electrical and Electronics Measurements & Instrumentation", Dhanpat Rai& sons.
3. Kalsi, Electronic Instrumentation, Tata McGraw Hill

Reference Books

1. Terman& Petit, Electronic Measurement.
2. Carr, Instrumentation, Pearson Education

List and Links of e-learning resources: MCET – http://sgsmcet.co.in/eie .

Modes of Evaluation and Rubric

The evaluation modes consist of performance in Two mid-semester Tests, Quiz/ Assignments, term work, end-semester examinations, and end-semester practical examinations.

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