Guru Nanak Dev Engineering College, Ludhiana

An Autonomous College under UGC Act 1956

B.Tech. 2nd Year (ECE)

Course Code:BSEC101
Course Title: Probability & Random Processes

Programme: B.Tech.	**L:** 3 **T:** 1 **P:** 0	**Credits:**4
Semester: 3	**Theory/Practical:** Theory	**Teaching Hours:** 45(L)+15(T)= 60 hrs
Total Max. Marks: 100	**Continuous Assessment (CA) Marks:** 40	**End Semester Examination (ESE) Marks:** 60
Minimum Percentage of Numerical / Design / Programming Problems in ESE: 95%		
Duration of End Semester Examination (ESE): 3 hours		
Course Type: Basic Science Course		

Prerequisites (if any): NIL

Additional Material Allowed in ESE: NIL

On completion of the course, the student will have the ability to:

CO#	Course Outcomes
1	Understand the fundamental concepts of probability, evaluate conditionalprobabilities and apply Bayes' Theorem in solving real-world problems.
2	Identify and classify discrete and continuous random variables and compute their respective probability distributions.
3	Apply linearity of expectation and properties of variance in solving theoretical and applied problems.
4	Apply sampling theory and hypothesis testing concepts to analyze small sample data using t-test, F-test, and chi-square tests for drawing valid statistical inferences.
5	Explain key concepts of random processes and classification of processes
6	Explain the structure of queueing systems and use basic models to study service and waiting times.

Contents

Part-A

Unit-1 Probability Theory **9(L) hrs**

Probability spaces, theorems of Probability: addition theorem, multiplication theorem on probability, conditional probability and independence of events, Law of total probability, Baye's theorem.

Unit-2 Random Variables **9(L) hrs**

Random Variable: Discrete and continuous random variables, probability mass function, probability density function, distribution functions, exponential densities, Bivariate random variables: discrete and continuous. Joint and Marginal density functions, conditional distributions.

Unit-3 Expectation **4(L) hrs**

Expectation of discrete and continuous random variables, properties of expectation, mean and variance using expectation.

Part-B

Unit-4 Test of Significance **9(L) hrs**

Sampling theory: Null hypothesis and alternate hypothesis, critical value, critical region, region of acceptance, level of significance, Type I and type II errors. Small sample tests: t-test for single mean and for difference of means, F-test (Variance Ratio-test), Chi square test for Goodness of fit and independence of attributes.

Unit-5 Random Processes **9(L) hrs**

Definition of random processes, Gaussian processes, Stationary processes, Markov Processes (MP), Classification of states in MP, Stationary Distributions in MP, Bernoulli's processes, Poisson processes, Combining and splitting of Poisson processes.

Unit-6Queueing Systems5(L) hrs

Basic Structures and Characteristics of Queueing Process, Poisson Points in Random Intervals, Renewal Processes, Arrivals and Departures, Little's Theorem, Immediate Service and M/G/1 system, Service-, Waiting- and Busy-Time.

Text Books

1. Probability - Random Variables and Stochastic Processes, 4th edition, by Athanasios Papoulis and S Pillai, McGraw Hill Education 2017.
2. John N. Daigle, Queueing Theory with Applications to Packet Telecommunication, Springer (2005)
3. R.K. Narula," Engineering Mathematics-III", First Edition, 2019, Sharma Publications.
4. B.S. Grewal, "Higher Engineering Mathematics", 36th Edition, Khanna Publishers, 2010.

Reference Books

1. E. Kreyszig, "Advanced Engineering Mathematics", 9th Edition, John Wiley & Sons, 2006.
2. Probability and Random Processes, 4th edition, by Geoffrey Grimmett (Author), DaviStirzaker, OUPOxford 2020.
3. Stochastic Processes: Theory for Applications, 1st edition, by Robert G. Gallager, CambridgeUniversity Press 2013.

Online Learning Materials

1. **https://www.khanacademy.org/math/statistics-probability/analyzing-categorical-data**

Accessed on May 02, 2025

Supplementary SWAYAM Course

Sr. No.	Course Name	Instructor	Host Institute	URL
1	Introduction to probability and Statistics	Prof. G. Srinivasan	IIT Madras	https://nptel.ac.in/courses/111106112

2	Probability and Random Processes	Prof. Mrityunjoy Chakraborty	IIT Kharagpur	https://archive.nptel.ac.in/courses/117/105/117105085/
3	Introduction to queueing theory	Prof. N. Selvaraju	IIT Guwahati	https://onlinecourses.nptel.ac.in/noc22_ma17/preview

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B.Tech. 2nd Year (ECE)

Course Code: CEC101
Course Title: Electronic Devices and Circuits

Programme: B.Tech.	**L:** 3 **T:**1 **P:**2	**Credits:**5
Semester: 3	**Theory/Practical:** Theory	**Teaching Hours:** 45(L)+15(T)+30(P) = 90 hrs
Total Max. Marks: 150	**Continuous Assessment (CA) Marks:** 90	**End Semester Examination (ESE) Marks:** 60
Minimum Percentage of Numerical / Design / Programming Problems in ESE: 30%		
Duration of End Semester Examination (ESE): 3 hours		
Course Type: Professional Core Course		

Prerequisites (if any):- ESE-101

Additional Material Allowed in ESE: Scientific Calculator

On completion of the course, the student will have the ability to:

CO#	Course Outcomes
1	Apply the basic mechanism of semiconductors in various types of diodes, bipolar junction transistors and field effect transistors.
2	Analyze the behavior of different electronic components in terms of V-I characteristics.
3	Select suitable techniques to provide stabilization in electronic circuits against external factors like temperature and component variations.
4	Design solutions for problems pertaining to electronic circuits under given operating conditions and specifications.
5	Comprehend the operation of low and high frequency transistor models.
6	Conduct experiments related to various semiconductor devices.

Contents

Part A

Unit 1: Introduction **7(L) hrs**

Atomic Structures, Energy bands in silicon, intrinsic and extrinsic silicon, N-Type and P-Type Semiconductor, carrier transport in silicon: diffusion current, drift current, mobility, and resistivity, generation and recombination of carriers.

Unit 2: Diode Circuits **8(L) hrs**

PN junction as a diode, V-I characteristics, Biasing, Depletion layer, Energy band structure of an open circuited P-N Junction, small signal equivalent circuit of diode, temperature dependence of PN diode, Rectifiers: Half wave rectifier, Full wave rectifier: Centre Tap andBridge Type, Filter circuits, Special Purpose Diodes: Tunnel diode, Varactor diode, QLED and Solar cell.

Unit 3: Transistor Biasing and Stabilization **10 (L) hrs**

Introduction to Bipolar junction transistor, Current components in a transistor, construction, working and characteristics in CB, CE and CC modes, transistor as an amplifier,Load Line, Operating point,

bias stability, various biasing circuits: fixed bias, emitter bias, Voltage divider bias, stabilization against I_{CO}, V_{BE} and beta, bias compensation methods: Thermistor and Sensistor compensation, UJT, photo-transistors.

Part B

Unit 4: Field Effect Transistors **9 (L) hrs**

Basic Structure, Operating Principle, I-V characteristicsof junction field effect transistor (JFET), MOSFETs: Enhancement and depletion type, FET parameters, Biasing of FETs, applications of FETs,MOS capacitor, MOSFET as a switch.

Unit 5: Low Frequency and High Frequency Transistor Mode 11 (L) hrs

h-parameter equivalent circuit of transistor, analysis of transistor amplifier using h-parameters in CB, CE and CC configuration, frequency response of amplifier, effect of an emitter bypass capacitor, coupling capacitor, emitter resistance and shunt capacitors on frequency response of amplifier, High frequency T model, common base short circuit current frequency response, alpha cutoff frequency, common emitter short circuit current frequency response, hybrid pi CE transistor model, hybrid pi conductance in terms of low frequency h parameters.

Tutorial hours will be used for practice sessions for design/numerical problems/programming/case studies etc (as the case may be).

Laboratory Work

Experiment No.	Experiment Title
1	To study the V-I characteristics of the p-n junction diode and determine static resistance and dynamic resistance.
2	To perform the operation of half wave rectifier.
3	To perform center tap & bridge full wave rectifier and calculate efficiency & ripple factor.
4	To study simple capacitive, T & π filters.
5	To implement any one application of photodiode.
6	To plot the input and output characteristics of CE configuration.
7	To plot the input and output characteristics of CB configuration
8	To design fixed bias circuit.
9	To design potential divider transistor biasing circuit.
10	To study the operation of BJT as an amplifier and find the amplification factor.
11	To observe the operation of an emitter follower circuit.
12	To plot JFET characteristics in CS configuration.
13	To simulate and implement MOSFET in different configurations and observe the characteristics.
14	To determine h- parameters of a transistor using output characteristics.
15	Student has to do any one of the following experiment as a project:

	(a)To observe the application of Zener diode as voltage regulator (b) To Implement MOSFET as a switch. (c) To perform the operation of Varactor diode.

Text Books

1. FLOYD "Electronic Devices" Pearson Education
2. J.B Gupta "Electronic Devices and Circuits" S.K Kataria & Sons
3. J. Millman, C., C. Halkias, "Electronic Devices & Circuits", Tata McGraw Hill.
4. R. L. Boylestad, "Electronic Devices & Circuits Theory", Prentice Hall India.

Reference books and other resources

1. A. Mottorshead, "Electronic Devices & Circuits", Prentice Hall India.
2. A. Malvino, D. J. Bates, "Electronics Principles", Tata McGraw Hill.
3. J. Millman, C. C. Halkias, "Integrated Electronics: Analog & Digital Circuits and Systems", Tata McGraw Hill.

Online learning material

1.https://www.youtube.com/watch?v=HfKd-Y2SBFA&list=PL350612601E2DBFDE&index=7
Accessed on May 02, 2025
2. https://www.youtube.com/watch?v=xhn188JafbM&list=PL350612601E2DBFDE
Accessed on May 02, 2025
3.https://www.youtube.com/watch?v=L28F1Oenyds&list=PL350612601E2DBFDE&index=2
Accessed on May 02, 2025
4. https://www.youtube.com/watch?v=PSdHf6yozyc
Accessed on May 02, 2025
5.https://www.youtube.com/watch?v=KsG_rsGF2g8&list=PL350612601E2DBFDE&index=17
Accessed on May 02, 20256.https://www.youtube.com/watch?v=Dfdzz64gux8&list=PL350612601E2DBFDE&index=4
Accessed on May 02, 2025
7. https://www.youtube.com/watch?v=aVN7D2xZBRE&list=PL350612601E2DBFDE&index=8
Accessed on May 02, 2025

Supplementary SWAYAM Course

Sr. No.	Course Name	Instructor	Host Institute	URL
1	Introduction to Electronic Circuits	Prof. S.C Dutta Roy	IIT Delhi	https://nptel.ac.in/courses/108102097

Experiments to be performed through Virtual Labs

Sr. No.	Experiment Name	Experiment Link(s)
1.	To study the V-I characteristics of the p-n junction diode and determine static resistance and dynamic resistance.	https://be-iitkgp.vlabs.ac.in/exp/characteristics-diode/
2.	To perform the operation of half wave rectifier.	https://be-iitkgp.vlabs.ac.in/exp/half-wave-rectification/
3.	To perform full wave & bridge rectifier and calculate efficiency and ripple factor.	https://be-iitkgp.vlabs.ac.in/exp/full-wave-rectification/
4.	To observe the application of Zener diode as voltage regulator	https://be-iitkgp.vlabs.ac.in/exp/voltage-regulator/
5.	To plot the input and output characteristics of CE configuration.	https://be-iitkgp.vlabs.ac.in/exp/common-emitter-characteristics/

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B.Tech. 2nd Year (ECE)

Course Code: CEC102
Course Title: Signals and Systems

Programme: B.Tech.	**L:** 3 **T:** 1 **P:** 2	**Credits:** 5
Semester: 3	**Theory/Practical:** Theory	**Teaching Hours:** 45(L)+15(T)+30(P) = 90 hrs
Total Max. Marks: 150	**Continuous Assessment (CA) Marks:** 90	**End Semester Examination (ESE) Marks:** 60
Minimum Percentage of Numerical / Design / Programming Problems in ESE: 50%		
Duration of End Semester Examination (ESE): 3 hours		
Course Type: Professional Core Course		

Prerequisites (if any): BSC102

Additional Material Allowed in ESE: Scientific Calculator.

On completion of the course, the student will have the ability to:

CO#	Course Outcomes
1	Classify signals based on their characteristics and perform basic operations on signals.
2	Interpret continuous and discrete system characteristics.
3	Analyze various methods to categorize the LTI systems and identify solutions for mathematical representations of systems.
4	Analyze the spectral properties of signals using Fourier analysis.
5	Apply Z- transform to study discrete-time signals and systems.
6	Simulate and Conduct experiments involving various operations on signals and response of systems using appropriate tools.

Contents

Part-A

Unit-1 Signals and Classification **7(L) hrs**

Definition of signals, Classification of signals. Elementary signals. Basic operations on Signals: Operations Performed on the Independent and Dependent Variable.

Unit-2 Systems and Properties **7(L)hrs**

Definition of Systems, System Viewed as Interconnection of Operations, Properties of Systems: Linearity, Time Invariance, Memory, Causality, Stability and Invertibility.

Unit-3 Time Domain Representations of Linear Time Invariant Systems **7(L) hrs**

Impulse response characterization and convolution for CT-LTI and DT-LTI systems, Properties of LTI systems. LTI systems characterized by Differential and Difference equations. Group delay and Phase delay.

Part-B

Unit-4 Fourier Analysis of Continuous Time Signals **8(L) hrs**

Fourier series: Dirichlet's conditions, Trigonometric Fourier series, Complex Fourier series, Properties. Continuous Time Fourier Transform, Properties of CTFT, Frequency response. Fourier

Transform of Periodic Power Signals. Sampling. Power Spectral Density, Energy Spectral Density.

Unit-5 Fourier Analysis of Discrete Time Signals **8(L) hrs**

Discrete Time Fourier Series, Properties of DTFS, Discrete Time Fourier Transform, Properties of DTFT, DTFT of Periodic Signals, Convolution and Modulation for Signals, Parseval Relation. Frequency response.

Unit-6 Z-transform and applications8(L) hrs

Representation of Signals Using Discrete-Time Complex Exponentials: Z-Transform, Significance and Properties of Region of Convergence, Properties of Z-Transform, Inverse Z-Transform, relationship of z-transform with Fourier transform, applications of Z-transform to solutions of difference equations.

Tutorial hours will be used for practice sessions for design/numerical problems/programming/case-studies etc. (as the case may be).

Laboratory Work

Experiment No.	Experiment Title *
1	To perform arithmetic operations on a matrix.
2	To generate step, ramp and impulse continuous and discrete signals.
3	To generate exponentially rising and decaying sinusoidal signal.
4	To generate rectangular signal and Gaussian function.
5	To generate periodic square and triangular wave.
6	To perform basic operations on independent variable in continuous and discrete signals.
7	To perform basic operations on dependent variable in continuous and discrete signals.
8	To find linear convolution of two sequences.
9	To perform verification of properties of convolution sum.
10	To find the response of an LTI system for given input and impulse response.
11	To compute frequency response of a system.
12	To compute Fourier transform and inverse Fourier Transform of the signal.
13	To solve differential equation.
14	To find z-transform and inverse z-transform of a sequence.
15	To create pole-zero plot of a system.
16	To perform image processing tasks. (Open-ended experimental exploration)

***Using MATLAB™**

Text Books

1. S. Haykins and B. V. Veen, "Signals and Systems, 2nd Edition, John Wiley & Sons, 2008.
2. B. Boulet, "Fundamentals of Signals and Systems", Thomson,2006.
3. Laboratory Manuals.

Reference Books

1. H. P. Hsu and R. Ranjan, "Signals and Systems", 2nd Edition, McGraw Hill Education Pvt. Ltd., 2008.
2. T. K. Rawat, "Signals and Systems", 1st Edition, Oxford University Press, 2010.
3. V. Oppenheim, A. S. Wilsky, "Signals and Systems", 2nd Edition, PHI, 2009.
4. M. J. Roberts, "Signals and Systems: Analysis using Transform Methods and MATLAB", 3rd Edition, McGraw-Hill, 2018.
5. S. D. Apte "Signals and Systems: Principles and Applications", Cambridge University Press, 1st Edition, 2016.

Online Learning Materials

1. http://www.di.univr.it/documenti/OccorrenzaIns/matdid/matdid744681.pdf Accessed on April 06, 2025
2. https://ocw.mit.edu/courses/electrical-engineering-and-computer-science/6-003-signals-and-systems-fall-2011/lecture-notes/ Accessed on April 06, 2025
3. https://web.iitd.ac.in/~deepakpatil/ell205.html Accessed on April 06, 2025
4. http://www.signalsandsystems.org/downloads Accessed on April 06, 2025

Supplementary SWAYAM Course

Sr. No.	Course Name	Instructor	Host Institute	URL
1	Principles of Signals and Systems	Prof. Aditya K. Jagannatham	IIT Kanpur	https://onlinecourses.nptel.ac.in/noc24_ee36/preview
2	Signals and Systems	Prof. Hitesh Shrimali, Prof. Kushal K. Shah	IIT Mandi, IISER Bhopal	https://onlinecourses.nptel.ac.in/noc24_ee28/preview

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B.Tech. 2nd Year (ECE)

Course Code: CEC103
Course Title: Digital System Design

Programme: B.Tech.	**L:** 3 **T:** 1 **P:** 2	**Credits:** 5
Semester: 3	**Theory/Practical:** Theory	**Teaching Hours:** 45(L)+15(T)+30(P) = 90 hrs
Total Max. Marks: 150	**Continuous Assessment (CA) Marks:** 90	**End Semester Examination (ESE) Marks:** 60
Minimum Percentage of Numerical / Design / Programming Problems in ESE: 40%		
Duration of End Semester Examination (ESE): 3 hours		
Course Type: Professional Core Course		

Prerequisites (if any): ESC101

Additional Material Allowed in ESE: NIL

On completion of the course, the student will have the ability to:

CO#	Course Outcomes
CO1	Apply the knowledge of Boolean Algebra, K-Map method to analyze and design digital circuits.
CO2	Identity, formulate, and solve engineering problems related to standard combinational circuits with consideration for sustainable development.
CO3	Apply appropriate techniques to analyze and design optimized synchronous / asynchronous sequential system to meet the desired application within realistic constraints.
CO4	Understand and apply EMI/EMC principles to enhance digital circuit reliability and safety.
CO5	Apply domain knowledge to assess the characteristics of different logic families and semiconductor memories for optimal and sustainable system design.
CO6	Verify underlying concepts and techniques in order to analyze and design digital systems through experimentation.

Contents

Part-A

Unit-1 Boolean Algebra and Minimization of Logic Functions **8(L) hrs**

Logic Gates: OR, AND, NOT, NOR, NAND, EX-OR, Boolean algebra, Basic theorem of Boolean algebra, Minimization using Boolean algebra, Standard representations of logic functions (SOP, POS, Canonical forms), K-map representation of Logic Functions, Minimization using K-map (upto 5 variables), Incompletely specified functions/Don't care Conditions.

Unit-2 Combinational Logic Design **10(L) hrs**

Design and Analysis of Combinational Circuits (Adders, Subtractors, Adders as Subtractors, Adder with look ahead carry, Multiplexers, Demultiplexers, Encoders, Decoders, 4-Bit Binary-to-Gray Code Converter, Parity Generator & Checker and Magnitude Comparator).

Unit-3 Sequential Circuit Design **10(L) hrs**

Introduction, Design Steps for Traditional Synchronous Sequential Circuits, Design and Analysis of Sequential Machines(Flip Flops – SR, JK, D and T flip flops – Level Triggering and Edge Triggering, Excitation tables – Counters – Asynchronous and Synchronous type Modulo Counters, Shift Registers and its types)

Part-B

Unit-4 Asynchronous Finite State Machines **10(L) hrs**

Scope, Asynchronous Analysis, Design of Asynchronous Machines, Cycle and Races, Plotting and Reading the Excitation Map, Electromagnetic Interference and Electromagnetic Compatibility Grounding and Shielding of Digital Circuits, Interfacing digital system with different media like fiber cable, co-axial cable etc.

Unit-5 Digital Logic Families and Semiconductor Memories **7(L) hrs**

Introduction to Logic Families: RTL, DCTL, DTL, TTL, ECL, CMOS logic families and their types, Comparison of different logic families, Semiconductor Memories: ROMs, RAM Memories, Content Addressable Memories, Charge-Coupled Device Memory, Magnetic Core Film Memory, PLDs- PLA and PAL.

Tutorial hours will be used for practice sessions for design/numerical problems/programming/case-studies etc. (as the case may be).

Laboratory Work

Experiment No.	Experiment Title
1	To study basic logic ICs and verify their truth tables: • IC-7404 (NOT Gate) • IC-7432 (2-Input OR Gate) • IC-7408 (2-Input AND Gate) • IC-7400 (2-Input NAND Gate) • IC-7402 (2-Input NOR Gate) • IC-7486 (2-Input EX-OR Gate)
2	To study basic logic ICs and verify their truth tables • IC-74266 (2-Input EX-NOR Gate) • IC-7411 (3-Input AND Gate) • IC-74HC4075 (3-Input OR Gate) • IC-7410 (3-Input NAND Gate) • IC-7427 (3-Input NOR Gate)
3	To realize the OR, AND, NOT and XOR functions using universal gates.
4	To realize the Half Adder and Full Adder circuits using logic gates.
5	To realize the Half Subtractor and Full Subtractor using logic gates.
6	To design 4-Bit Binary-to-Gray Code Converter using logic gates.
7	To verify the truth-table of 16:1 Multiplexer and 1:16 Demultiplexer.
8	To design and verify S-R flip-flop using NAND/NOR gates.
9	To verify the truth-tables of J-K, D, and T flip-flops.
10	To realize SIPO, SISO, PIPO, and PISO shift register circuits using D flip-flops.
11	To design MOD-10 synchronous up-counter using D flip-flops.
12	To operate the counters using ICs 7490/7493/74192 and verify the frequency division at each

	stage with a low frequency clock (1 Hz) and display the count using LEDs.
13	To study shift-register operations using IC 7495 chip.
14	To verify the truth table of decoder driver 7447/7448 and operate a 7-segment LED/LCD display.
15	To study the application of basic logic gates in: (i) Fire alarm system (ii) Burglar alarm system

Mini Project: Student has to do an experiment no. 15 independently as project

Text Books

1. W. I. Fletcher, "An Engineering Approach to Digital Design", Prentice Hall India, 1990.
2. Thomas L. Floyd, Digital Fundamentals, Pearson Education, New Delhi, 2003.
3. Laboratory Manuals

Reference Books

1. Morris Mano, Digital Design, Prentice Hall of India Pvt. Ltd
2. Donald P. Leach and Albert Paul Malvino, Digital Principles and Applications, 5 ed., Tata McGraw Hill Publishing Company Limited, New Delhi, 2003.
3. Ronald J. Tocci, Neal S. Widmer, Gregory L. Moss, Digital System-Principles and Applications, Pearson Education.
4. R. P. Jain, Modern Digital Electronics, Tata McGraw–Hill Education Pvt. Limited, New Delhi.
5. Robert L. Miller, "Designing with TTL Circuits", McGraw Hill. 2. Richard F. Tinder, "Engineering Digital Design", Academic Press.
6. John F. Wakerly, "Digital Design- Principles and Practices", Pearson Education.
7. David J. Comer, "Digital Logic and State Machine Design", Oxford University Press.

Online Learning Materials

1. https://nptel.ac.in/courses/106108099 Accessed on 30/04/2025
2. https://www.cl.cam.ac.uk/teaching/0708/DigElec/Digital_Electronics_pdf.pdf Accessed on 30/04/2025

Supplementary SWAYAM Course

Sr. No.	Course Name	Instructor	Host Institute	URL
1.	Digital Circuits	Prof. Anil Mahanta, Prof. Roy Paily Palanthinkal	IIT, Guwahati	https://nptel.ac.in/courses/117103064

Experiments to be performed through Virtual Labs

Sr. No.	Experiment Name	Experiment Link(s)
1	To study basic logic ICs and verify their truth tables.	https://ade-iitr.vlabs.ac.in/exp/familiarization-of-ics/
2	To study the operation of BCD to decimal decoder using IC-7442	https://ade-iitr.vlabs.ac.in/exp/decimal-decoder/
3	To design full subtractor using 74153 MUX IC and verify the truth table.	https://ade-iitr.vlabs.ac.in/exp/full-subtractor/
4	To study the application of basic logic gates in: (i) Fire alarm system (ii) Burglar alarm system	https://ade-iitr.vlabs.ac.in/exp/logic-gates/

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B.Tech. 2nd Year (ECE)

Course Code: SMEC101
Course Title: Seminar and Technical Report Writing for Engineers

Programme: B.Tech.	**L:** 0**T:**0 **P:**2	**Credits:**1
Semester: 3	**Theory/Practical:** Practical	**Teaching Hours:** 30(P) = 30 hrs
Total Max. Marks: 50	**Continuous Assessment (CA) Marks:** 50	**End Semester Examination (ESE) Marks:**NIL
Duration of End Semester Examination (ESE): NA		
Course Type: Project work, Seminar and Internship		

Prerequisites (if any): NIL

Additional Material Allowed in ESE: NIL

On completion of the course, the student will have the ability to:

CO#	Course Outcomes
1	Describe the layout of a technical report.
2	Develop a visually represented technical poster.
3	Examine a technical report for plagiarism.
4	Conduct an elaborate state of the art study.
5	Demonstrate presentation skills through power point presentation.
6	Write an elaborative technical report.

Contents

Experiment No.	Experiment Title
1	To study the basic structure and format of a technical report.
2	To understand the procedure to access E-journals in digital library.
3	To write an effective abstract for a technical topic.
4	To prepare and deliver a technical PowerPoint presentation.
5	To understand plagiarism and apply IEEE referencing style.
6	To conduct a literature survey on a chosen technical topic.
7	To design a technical poster for visual presentation.
8	To enhance technical writing using proper grammar and tone.
9	To perform peer review and provide constructive feedback.
10	To write a complete seminar report on a technical topic.
11	To present a seminar and answer related technical queries.

Mini Project: Student has to do a project assigned from course contents in a group of students. They must submit a project report and give a presentation of the same.