

# *Chhattisgarh Swami Vivekanand Technical University , Bhilai*

## Scheme of Teaching and Examination

### **B.E. IV SEMESTER APPLIED ELECTRONICS AND INSTRUMENTATION**

S.No.	Board of studies	SUBJECT CODE	Subject Name	Period Per Week			Scheme of Exam			Total Marks	Credit L+(T+P)/2
				L	T	P	Theory / Practical				
							ESE	CT	TA		
1	Appl. Mathematics	328411 (14)	MATHEMATICS-IV	3	1	-	80	20	20	120	4
2	Electronics & Inst.	327411 (27 )	APPL. ELECTRONICS - I	3	1	-	80	20	20	120	4
3	Electrical Engg.	328412 (24)	ELECTRICAL MACHINES	3	1	-	80	20	20	120	4
4	Electronics & Telecomm.	328414 (28)	DIGITAL ELECTRONIC Circuits	3	1	-	80	20	20	120	4
5	Electronics & Telecomm.	328415(28)	SIGNALS AND SYSTEMS	3	1	-	80	20	20	120	4
6	Electronics & Inst.	327412(27 )	SENSORS AND TRANSDUCERS	3	-	-	80	20	20	120	3
7	Electronics & Inst.	327421(27)	APPLIED ELECTRONICS Lab	-	-	4	40	-	20	60	2
8	Electronics & Telecomm.	327422( 28)	DIGITAL ELECTRONIC Circuits Lab	-	-	3	40	-	20	60	2
9	Electronic & Inst.	327423(27)	SENSORS AND TRANSDUCERS Lab	-	-	4	40	-	20	60	2
10	Electronic & Inst.	327424(27)	ELECTRONICS SIMULATION LAB-I	-	-	3	40	-	20	60	2
11	Humanities etc.	300425( 46 )	Health Hygiene and Yoga	-	-	2	-	-	40	40	1
12			Library	-	-	1	-	-	-	-	-
			<b>TOTAL</b>	<b>18</b>	<b>5</b>	<b>17</b>	<b>640</b>	<b>120</b>	<b>240</b>	<b>1000</b>	<b>32</b>

L-Lecture, T- Tutorial, P- Practical, ESE- End Semester Examination, CT- Class Test,TA- Teacher's Assessment

Note (1) : Duration of all theory papers will be of **Three Hours**.

Note (2) : Industrial Training of six weeks is mandatory for B.E. student . It is to be completed in two parts. The first part will be in summer after IV sem. after which students have to submit a training report which will be evaluated by the college teachers during B.E. V sem.

**CHHATTISGARH SWAMI VIVEKANAND TECHNICAL UNIVERSITY,  
BHILAI (C. G.)**

Semester: **B.E. 4<sup>th</sup> Sem.**

**Branch:** Applied Electronics & Instrumentation,  
Electronics & Telecom., Electronics & Instrumentation  
**Code: 328411(14)**

Subject: **Mathematics-IV**

Total Theory Periods:**40**

Total Tutorial Periods: **10**

Total Marks in End Semester Exam: **80**

Minimum number of class tests to be conducted: **02**

**UNIT - 1 SERIES SOLUTION OF DIFFERENTIAL EQUATIONS AND SPECIAL FUNCTIONS** (No. of periods 8+2)

Series solution of differential equations, The method of Frobenius, Bessel's differential equation, Bessel's function of the First Kind - recurrence relations, generating function, orthogonality, Legendre's differential equation, Legendre's polynomial - Rodrigue's formula, generating function, recurrence relations, orthogonality.

**UNIT - 2 PARTIAL DIFFERENTIAL EQUATIONS:** (No. of periods 8+2)

Formation, Solution of Lagrange's linear differential equation, homogeneous linear differential equation with constant coefficients, non-homogeneous linear differential equations, Method of separation of variables.

**UNIT - 3 APPLICATIONS OF PARTIAL DIFFERENTIAL EQUATIONS (No. of periods 8+2)**

Initial & boundary value problems, Vibrations of a stretched string, D'Alembert's solution, One-dimensional heat flow, Transmission of signals along a cable - Telephone equation, Telegraph & radio equations, Vibrations of rectangular & circular membranes.

**UNIT - 4 Z - TRANSFORM** (No. of periods 8+2)

Sequence, Basic operations on sequences, Definition of Z- Transform, Linearity, Change of scale & shifting properties, Z-transform of standard sequences, Inverse Z- Transform, Multiplication by n & division by n, Initial value & final value theorems, Convolution of sequences, Convolution theorem, Inverse Z- transform by partial fraction, power series and residue methods. Application to solution of difference equations.

**UNIT - 5 RANDOM VARIABLE & PROBABILITY DISTRIBUTIONS**

(No. of periods 8+2)

Random variable, Discrete & continuous probability distributions, Mathematical Expectation, Mean & variance, Moments & moment generating function, Probability distributions -Binomial, Poisson & Normal distributions.

**TEXT BOOKS: -**

1. Higher Engg. Mathematics by Dr. B.S. Grewal– Khanna Publishers.
2. Advanced Engg. Mathematics by Erwin Kreyszig – John Wiley & Sons.

**REFERENCE BOOKS: -**

1. Advanced Engg. Mathematics by R.K. Jain and S.R.K. Iyengar – Narosa Publishing House.
2. Applied Mathematics by P.N. Wartikar & J.N. Wartikar. Vol- II– Pune Vidyarthi Griha Prakashan, Pune.

**CHHATTISGARH SWAMI VIVEKANAND TECHNICAL UNIVERSITY,  
BHILAI (C.G.)**

Semester: IV

Branch: Applied Electronics &  
Instrumentation, Electronics & Instrumentation

Subject: **Applied Electronics – I**

Code: 327411 (27)

Total Theory Periods: 40

Total Tut. Periods: 10

Total Marks in end Semester Exam.: 80

Minimum number of class tests to be conducted: 02

**Unit 1 Transistor at Low Frequencies**

Graphical analysis of CE configuration, Two port devices and the hybrid model, Transistor hybrid model, h parameters, Conversion formulas for the parameters of the three transistor configuration, Analysis of a transistor amplifier circuit using h Parameters, Thevenin's and Norton's theorems and corollaries, Emitter follower, Comparison of transistor amplifier configuration, Linear analysis of a transistor circuit, Miller's theorem and its dual, Cascading transistor amplifiers, Simplified Common Emitter hybrid model, Simplified Calculations for the Common Collector configuration, Common Emitter Amplifier with an emitter resistance, High input resistance transistor circuits

**Unit 2 Transistor at High Frequencies**

The hybrid  $-\pi$  common emitter transistor model, Hybrid-II conductances the hybrid  $-\pi$  capacitance, Validity of hybrid  $-\pi$  model, Variation of Hybrid  $-\pi$  parameters, The CE short circuit Current gain, Current gain with resistive load, Single  $-\pi$  stage CE transistor amplifier response, The gain bandwidth product, Emitter follower at high frequencies

**Unit 3 Multistage Amplifier**

Classification of amplifiers, Distortion in amplifier Frequency Response of an amplifier, Bode plots, Step response of an amplifier, Band pass of cascaded stages. RC  $-\pi$  coupled amplifier, Low frequency response of RC-coupled stage, Effect of emitter by pass- capacitor on low- frequency response, High frequency response of two cascaded CE transistor stages, Multistage CE amplifier cascade at high frequencies, Noise Figure.

**Unit 4 Feedback Amplifier & Oscillator**

Classification of amplifiers. Feedback concept, Transfer gain with feed back, General Characteristics of Negative feedback amplifiers, Input resistance, Output resistance, Method of analysis of a feedback amplifier, Voltage series feedback, Voltage series feedback pair, Current series feedback, Current shunt feedback, Voltage shunt feedback. Sinusoidal Oscillators, Phase shift Oscillator, Resonant Circuit Oscillators, General form of Oscillator Circuit, Wein Bridge Oscillator, Crystal Oscillators, Frequency stability

**Unit 5 Power Circuits and systems**

Class A large Signal amplifiers, Second harmonic distortion, Higher order harmonic distortion, Transformer coupled audio power amplifier, Efficiency, Pushpull amplifiers, Class B amplifiers, class AB Operation

**Name of the Text Books :**

1. Milman & Halkias, "Integrated Electronics", Tata McGraw Hill Edition 1991

**Name of Reference Books :**

1. Albert Paul Malvino, "Electronic Principles", Tata McGraw Hill
2. Bernard Grob, "Basic Electronics", McGraw Hill
3. Millman & Gabrel, "Micro Electronics", Tata McGraw Hill

**CHHATTISGARH SWAMI VIVEKANAND TECHNICAL UNIVERSITY,  
BHILAI (C. G.)**

Semester: **B.E. 4<sup>th</sup> Sem.**

Branch: Applied Electronics &  
Instrumentation, Electronics & Instrumentation

Subject: **Electrical Machines**

Code: **328412(24)**

Total Theory Periods: **40**

Total Tutorial Periods: **10**

Total Marks in End Semester Exam: **80**

Minimum number of class tests to be conducted: **02**

**Unit-1 DC Machines**

Construction of DC Machines, Generator action, EMF equations, Operating characteristics of DC generators, Motor action, Development of torque equation, Operating characteristics of DC Motors, Starting and speed control of DC Motors, Losses, Efficiency, Application.

**Unit-2 Transformer**

Construction, Principle of operation, Transformation ratio, equivalent circuit diagram, phasor diagram, efficiency, voltage regulation.

Three phase transformer, types, different connections of three phase transformer

**Unit-3 Alternator**

Construction, Principle of operation, single phase & poly-phase winding pitch and distribution factor, emf equation, phasor diagram, synchronous reactance & impedance, voltage regulation by synchronous impedance methods.

**Unit-4 Phase Induction Motors**

Construction, Principle of operation, wound rotor and squirrel cage type rotors, equivalent circuit diagram, phasor diagram, torque-slip characteristics, Methods of starting & speed control of induction motors, losses, efficiency.

**Unit-5 Synchronous Motor and Drives**

Construction and principle of operation, phasor diagram, effect of excitation on power factor, synchronous condenser, methods of starting of synchronous motors, construction and starting methods of single phase induction motor, servo motor.

**Name of the Text Books :**

1. I.J. Nagrath and D.P. Kothari, "Electric Machines", Tata McGraw Hill
2. B.L. Thareja, "Text Book of Electrical Technology Vol. II", S. Chand Publication

**Name of Reference Books :**

1. P.S. Bhimra, "Electric Machinery", Khanna Publications.
2. P.K. Mukherjee, S. Chakraortyi, "Electric Machinery", Dhapat Rai Publications.
3. Fitzgerald, Kingsley and Umans, "Electric Machinery" Tata McGraw Hill.

**CHHATTISGARH SWAMI VIVEKANAND TECHNICAL UNIVERSITY  
BHILAI (C.G.)**

Semester : **IV**

Branch: Applied Electronics & Instrumentation  
Electronics & Instrumentation

Subject: **Digital Electronic Circuits**

Code: **328414 (28)**

Total Theory Periods: **40**

Total Tutorial Periods: **10**

Total Marks in End Semester Examination: **80**

Minimum number of Class tests to be conducted: **Two**

**UNIT - I**

**CODES:** *Binary codes:* Introduction & usefulness, Weighted & Non-weighted codes, Sequential codes, self complementing codes, Cyclic codes, 8-4-2-1 BCD code, Excess-3 code, Gray code: Binary to Gray and Gray to binary code conversion, Error detecting code, Error correcting code, 7-bit Hamming code, ASCII code, EBCDIC code.

**Realization of Boolean Expressions:** Reduction of Boolean expressions using laws, theorems and axioms of Boolean Algebra, Boolean expressions and logic diagram, Converting AND/OR/Invert logic to NAND/NOR logic, SOP and POS Forms and their Realization.

**UNIT –II**

**MINIMIZATION TECHNIQUES:** Expansion of a Boolean expression to SOP form, Expansion of a Boolean expression to POS form, Two, Three & Four variable K-Map: Mapping and minimization of SOP and POS expressions. Completely and Incompletely Specified Functions - Concept of Don't Care Terms; Quine – Mc Clusky Method.

**UNIT III:**

**COMBINATIONAL CIRCUITS:** *Adder & Subtractor:* Half adder, Full adder, half subtractor, Full subtractor, Parallel Binary adder, Look Ahead carry adder, Serial adder, BCD adder. Code converter, Parity bit generator/Checker, Comparator. *Decoder:* 3-line to 8-line decoder, 8-4-2-1 BCD to Decimal decoder, BCD to Seven segment decoder. *Encoder:* Octal to binary and Decimal to BCD encoder. *Multiplexer:* 2-input multiplexer, 4-input multiplexer, 16-input multiplexer *Demultiplexer:* 1-line to 4-line & 1-line to 8-line demultiplexer, Multiplexer as Universal Logic Function Generator, Programmed Array Logic (PAL) PLA, PLD.

**UNIT – IV**

**SEQUENTIAL CIRCUITS:** *Flip-Flops & Timing Circuit:* S-R Latch; Gated S-R Latch; D Latch; J-K flip-Flop; T Flip-Flop; Edge Triggered S-R, D, J-K and T Flips-Flops; Master - Slave Flip-Flops; Direct Preset and Clear Inputs. *Shift Registers:* PIPO, SIPO, PISO, SISO, Bi-Directional Shift Registers; Universal Shift register. *Counter:* Asynchronous Counter: Ripple Counters; Design of asynchronous counters, Effects of propagation delay in Ripple counters, Synchronous Counters: 4-bit synchronous up counter, 4-bit synchronous down counter, Design of synchronous counters, Ring counter, Johnson counter, Pulse train generators using counter, Design of Sequence Generators; Digital Clock using Counters.

**UNIT – V**

**DIGITAL LOGIC FAMILIES:** Introduction; Simple Diode Gating and Transistor Inverter; Basic Concepts of RTL and DTL; *TTL:* Open collector gates, TTL subfamilies, IIL, ECL; *MOS Logic:* CMOS Logic, Dynamic MOS Logic, Interfacing: TTL to ECL, ECL to TTL, TTL to CMOS, CMOS to TTL, Comparison among various logic families, Manufacturer's specification.

**Text Book:**

1. Fundamentals of Digital Circuits: A. Anand Kumar, PHI
2. Digital Integrated Electronics: H. Taub and D. Schilling: TMH

**Reference Books:**

1. Digital Fundamentals: Floyd & Jain: Pearson Education
2. Digital Electronics: A.P. Malvino: TMH.
3. Digital Circuits & Logic Design – LEE, PHI

**CHHATTISGARH SWAMI VIVEKANAND TECHNICAL UNIVERSITY  
BHILAI (C.G.)**

Semester : **IV**

Branch: Applied Electronics & Instrumentation  
Electronics & Instrumentation

Subject: **Signals & Systems**

Code: **328415 (28)**

Total Theory Periods: **40**

Total Tutorial Periods: **10**

Total Marks in End Semester Examination: **80**

Minimum number of Class tests to be conducted: **Two**

**UNIT – I**

**CLASSIFICATION OF SIGNALS & SYSTEMS** Classification of Signals: Continuous Time signals: Definition and expressions of Unit step, Ramp, Unit Impulse, Complex Exponential, General complex exponential, Real exponential, Sinusoidal signal. Discrete time signal: Unit sample sequence, Unit step sequence, Unit ramp sequence, Exponential sequence. Representation of discrete time signals: Deterministic and Random Signals, Periodic & Non-periodic Signal, Even & Odd Signals, Energy & Power Signals. Discrete Time systems: Adder, Constant multiplier, Signal multiplier, Unit delay block, Unit advance block. Classification of discrete time systems: Static & Dynamic, Causal & Non-causal, Time invariant & Time variant, Linear & Non-linear, Stable & Unstable systems

**UNIT – II**

**ANALYSIS OF CONTINUOUS TIME SIGNALS:** Fourier series representation of Periodic signals, Representation of Fourier series in Exponential form, Frequency spectrum, Properties of Continuous time Fourier series, Parseval's theorem, Fourier Transform, Properties of Fourier Transform, Fourier transform of some common time function Convolution property, Laplace Transform, Properties of Laplace Transform, Region of Convergence. Laplace transform of some common time function.

**UNIT – III**

**LINEAR TIME INVARIANT CONTINUOUS TIME SYSTEM:** Transfer function and Impulse response, Block diagram representation and Reduction technique, Convolution integral, State variable techniques, State equations for Electrical networks, State equations from transfer functions.

**UNIT – IV**

**ANALYSIS OF DISCRETE TIME SIGNALS:** Discrete Time Fourier Transform, Properties of DTFT, Discrete Fourier transform, Properties of DFT, Circular convolution, Z-Transform, Region of Convergence, Relation between Z-transform and DTFT, Properties of Z-transform, Inverse Z-Transform.

**UNIT – V**

**ANALYSIS OF DISCRETE TIME LTI SYSTEM:** Transfer function & Impulse response, Eigen function & Eigen value, Causality, Stability, LTI system characterized by Linear constant, Convolution sum, Convolution by graphical method, Block diagram representation for LTI systems described by difference equation, Unit impulse response, Introduction to Fast Fourier Transform.

**Text Book:**

Signals & Systems: Smarjit Ghosh, Pearson Education

Signals & Systems: Nagrath, Sharan, Ranjan & Kumar, TMH

**Reference Book:**

Signals & Systems: Farooq Husain, Umesh Publications

Signals, Systems and Communications: B.P. Lathi, BS Publications

Signals & Systems: Babu & Natarajan, Scitech Publications

**CHHATTISGARH SWAMI VIVEKANAND TECHNICAL UNIVERSITY,  
BHILAI (C.G.)**

**Semester: IV**

**Branch: Applied Electronics & Instrumentation,  
Electronics & Instrumentation**

**Subject: Sensors & Transducers**

**Code: 327412 (27)**

Total Theory Periods: 40

Total Tut Periods: 10

Total Marks in end Semester Exam.: 80

Minimum number of class tests to be conducted: 02

**Unit 1 Introduction to sensors & Transducer**

Mechanical detector, transducer's elements, Electrical Transducers: Transducer's classification, Transducer's description, sensitivity selection of an instrument transducer, variable resistance transducers, thermo electric transducers, variable inductance, transducer capacitive transducers, Piezo electric transducers, photo electric transducers.

**Unit 2 Metrology**

Dimensional Measurements, meter rods scales & tapes, Length amplification vernier caliper, micrometer, dial gauge, gauge blocks, Angular measurement, Area measurement.

**Unit 3 Pressure Sensors**

Terminology, Pressure units & Measuring instruments, Manometers, mechanical displacement type pressure gauges, Elastic Pressure transducer's Low pressure gauges, Dead weight Piston gauge.

**Unit 4 Flow Sensors**

Nature of flow classification of fluid flow measurement techniques, Theory of variable head meters, constructional details of variable head meters, Flow Measurement Instruction, Nature of flow, Classification of fluid flow measurement techniques, Theory of variable head meters, Constructional details of Variable head meters – Venturimeter, Flow Noggle, Orifice How meter variable area flow meters, Quantity meters, Special flow meters- Hot wire Anemometer, Allen salt velocity method, EM flow meter, Ultrasonic flow meter, Thermal flow meter Quantity meters, special flow meters, flow visualization

**Unit 5 Temperature Sensors**

Temperature Scales, Temperature measuring Instruments, Liquid in glass thermometers Bi metallic thermometer filled system thermometers, Thermocouples Resistance thermometers & thermostates Radiation & Optical Pyrometers, Calibration of temperature sensors Errors & Precaution in temperature measurements.

**Name of the Text Books :**

1. D.V.S.Muty, "Transducers and Instrumentation", PHI, 10<sup>th</sup> print 2003.
2. D.S. Kumar, "Mechanical Measurement & Control", Metropolis Publication

**Name of Reference Books :**

1. A. K. Sawhney, "Electrical & Electronics Measurement & Instrumentation", Dhanpat Rai Publication
2. Joseph J. Carr, "Elements of Electronic Instrumentation and Measurements, 3/e", Pearson Education

**CHHATTISGARH SWAMI VIVEKANAND TECHNICAL UNIVERSITY,  
BHILAI (C.G.)**

Semester IV

Branch Applied Electronics & Instrumentation,  
Electronics & Instrumentation  
Practical Code 327421 (27)

Subject **Applied Electronics Lab**

Total Practical Periods 36

Total Marks in end Semester Exam. 40

**Experiments to be performed (Minimum 10 experiments)**

1. To study RF Tuned amplifier with its freq. Response & calculation of resonant freq.
2. To study & calculation of 2 stage RC coupled amplifier for individual & over all gain.
3. To study frequency response curve of voltage shunt feedback amplifier.
4. To study current series feedback amplifier With measurement of vol. Gain with un bypassed vol. Resistor & to measure freq. response curve
5. Study of variation in resonant frequency of wein bridge oscillator
6. Study of variation in resonant frequency of Hartley oscillator
7. Study of variation of frequency rouge of RC phase shift oscillator
8. Study of variation in frequency of colpitt's oscillator
9. Study of variation in frequency of clapp's oscillator
10. Study of frequency response of class 'A' power amplifier & calculation of frequency
11. Study of variation in resonant frequency of wein –bridge oscillator
12. Comparison of phase shifted and feedback voltage waveform
13. To calculate percentage tilt of amplifier using square wave
14. Study of class B push pull amplifier

**List of Equipments/Machine Required:**

1. Analog & Digital Trainer Kit
2. Feed –back amplifier
3. Hartley oscillator
4. Power amplifier
5. R-C coupled amplifier
6. R –C phase shift oscillator
7. Wein bridge oscillator



**CHHATTISGARH SWAMI VIVEKANAND TECHNICAL UNIVERSITY  
BHILAI (C.G.)**

Semester : **IV**

Branch: Applied Electronics & Instrumentation  
Electronics & Instrumentation

Subject: **Digital Electronic Circuits Lab**

Code: **327422 (28)**

Total Practical Periods: **36**

Total Marks in End Semester Examination: **40**

**Experiments to be performed: (Minimum 10 experiments)**

1. To Verify The Properties of NOR & NAND Gates As Universal Building Block.
2. Realization of Boolean Expression Using NAND Or NOR Gates.
3. To Construct X- OR Gate Using Only NAND Or NOR Gates Only.
4. To Construct A Half Adder Circuit. And Logic Gates And Verify its Truth table.
5. To Construct A Full Adder Circuit. And Verify its truth table (Using Two X-OR And 3 NAND Gates).
6. To Construct A Half Subtractor Circuit. By Using Basic Gates And Verify its truth table.
7. To Construct A Full Subtractor Circuit By Using Basic Gates And Verify its truth table.
8. To Construct A Circuit of 4 -Bit Parity Checker & Verify its truth table.
9. To Construct A Programmable Inverter Using X-OR Gates & Verify its truth table.
10. To Design A Comparator Circuit & Verify its truth table.
11. To Construct A RS Flip Flop Using Basic & Universal Gates (NOT,NOR & NAND)
12. To Construct A J.K. Master Slave Flip Flop & Verify its truth table
13. To Verify The Operation of A Clocked S-R Flip Flop And J. K. Flip Flop
14. To Construct A T & D Flip Flop Using J. K. Flip Flop And Verify Its Operations & truth table.
15. To Verify The Operation of A Synchronous Decade Counter
16. To Verify The Operation of Various Decoding And Driving Devices
17. To perform the operation of BCD Counter Using 7490

**List of Equipments/Machine Required:**

Circuit components, Power supply, CRO, Function generator

**CHHATTISGARH SWAMI VIVEKANAND TECHNICAL UNIVERSITY,  
BHILAI (C.G.)**

Semester IV

Branch Applied Electronics & Instrumentation  
Electronics & Instrumentation  
Practical Code 327423 (27)

Subject **Sensors And Transducers Lab**

Total Practical Periods 36

Total Marks in end Semester Exam. 40

**Experiments to be performed (Minimum 10 experiments)**

1. Study of LVDT characteristics and its calibration.
2. Measurement of displacement by using LVDT.
3. Study of Hall –Effect characteristics
4. Study of Thermocouple characteristics (Change in voltage as a function of temperature)
5. To measure the variations in output voltage proportional to resistance of R.T.D.
6. Study of transistor as temperature sensor (Measurement of output voltage proportional to temperature)
7. Study of characteristics of Platinum RTD.
8. Study of characteristics of NTC thermistor.
9. Study of characteristics of IC temperature sensor.
10. Measurement of force using strain guage.
11. Measurement of pressure using pressure Transducer and to calculate percentage error.
12. Study of characteristics of photo- voltaic cell.
13. Study of characteristics of photo- conductive cell.
14. Study of characteristics of PIN photo diode.
15. Study of change of resistance with light intensity.

**List of Equipments/Machine Required:**

1. LVDT trainer kit
2. Hall –Effect characteristic trainer kit
3. Transistor as temperature sensor trainer kit
4. Temperature transducer kit
5. Strain guage kit
6. Dynamic strain amplifier kit
7. Pressure transducer kit
8. Optical transducer kit
9. LDR optical sensor kit
10. Piezoelectric kit

**CHHATTISGARH SWAMI VIVEKANAND TECHNICAL UNIVERSITY,  
BHILAI (C.G.)**

Semester IV

Branch Applied Electronics & Instrumentation,  
Electronics & Instrumentation  
Practical Code 327424 (27)

Subject **Electronics Simulation Lab – I**

Total Practical Periods 36

Total Marks in end Semester Exam. 40

**Experiments to be performed (Minimum 10 experiments)**

1. Design Low Pass and high pass filters using R - C and R - L which have cut off frequency of 100 KHz, 100 MHz.
2. Design Band Pass filter using, R - L and C which have bandwidth of 100 KHz and 100 MHz.
3. Design a circuit which have bandwidth of 100 KHz and quality factor of 10.
4. Design a circuit which have resonant frequency of 100 Hz.
5. Design a circuit which will satisfy the Boolean Theorems using diodes.
6. Design a circuit which have discharging time constant, twice of charging time constant.
7. Design a circuit for 100 percent rectification with nearly equal to zero ripples.
8. Design a circuit to clipp 20% of the input signal.
9. Design a circuit to clamp the input signal by 5 units.
10. Design circuit which will attenuate the input signal by 25%
11. (a) Design a All–Pass circuit  
(b) Design a band–stop filter having frequency range of 100 KHz to 150 KHz
12. Design a high pass filter circuit which will behave as differentiator.
13. Design a low pass filter circuit which will behave as integrator
14. Design Power amplifier Circuit For 80% efficiency.
15. Design phase shift Oscillator for generating 500 Hz frequency.
16. Design Wein bridge oscillator for generating 1 KHz frequency.

**List of Software Required:**

1. Soft ware required
2. Net draw
3. Circuit Maker
4. Pspice

**CHHATTISGARH SWAMI VIVEKANAND TECHNICAL UNIVERSITY,  
BHILAI**

Semester : IV Sem. Branch: Common for all branches  
Subject : **HEALTH, HYGIENE & YOGA** Code : 300425 (46)  
No. of Periods : 2 pds/week Tutorial Periods : NIL  
Total Marks in End Semester Exam. : NIL Teacher's Assessment: 40 Marks  
Minimum number of class tests to be conducted: Two

**UNIT- I**

**HEALTH & HYGIENE:** Concept of health, Physical health and mental health and wellbeing and how to achieve these, longevity and how to achieve it, concept and common rules of hygiene, cleanliness and its relation with hygiene; Overeating and undereating, amount of food intake required, intermittent fasting; adequate physical labour, sleep; consumption of junk fast food vs nutritious food; fruits, vegetables cereals and qualities of each of these.

**UNIT- II**

**INTRODUCTORY KNOWLEDGE OF COMMON STREAMS OF MEDICINAL CURE:** History, development, basic concepts, modes of operation of Alopahy, Ayurved, Homoeopathy, Biochemic, Unani, Siddha, Accupressure, Accupunture, Naturopathy, Yogic and Herbal system of medicines, Introduction of Anatomy and Physiology concerned.

**UNIT- III**

**YOGASANS:** Meaning and concept of Yoga, Yogasans and its mode of operation, How to perform Yogasans, Common Yogasans with their benefits, such as, Padahastasan, Sarvangasan, Dhanurasan, Chakrasan, Bhujangasan, Paschimottasan, Gomukhasan, Mayurasan, Matsyasan, Matsyendrasan, Pawanmuktasan, Vajrasan, Shalabhasan, Sinhasan, Shashankasan, Surya Namaskar, Halasan, Janushirasan, Utshep Mudra,

**UNIT- IV**

**YOGASANS FOR COMMON DISEASES:** From Yogic Materia Medica with symptoms, causes, asans and herbal treatment.

- **Modern silent killers:** High blood pressure, diabetes and cancer, causes and cure; Common health problems due to stomach disorders, such as, indigestion, acidity, dysentery, piles and fissures, arthritis, its causes, prevention and cure.
- **Asans for relaxation:** Shavasana, Makarasana, Matsyarakridasana, Shashankasana.
- **Asans to increase memory and blood supply to brain :** Shirsh padasana, Shashankasana.
- **Asans for eye sight:** Tratak, Neti Kriya .
- **Pranayam :** Definition and types : Nadi Shodhan, Bhastrik, Shitakari, Bhramari useful for students.

**UNIT V**

**CONCENTRATION:** Concentration of mind and how to achieve it. Tratak 1/4=kVd1/2] Concentration on breath, Japa 1/4ti1/2] Ajapajap 1/4vtikti1/2] internal silence 1/4vUreksZu1/2] visualization in mental sky 1/4fpnkdk'k /kkj.kk1/2] Concentration on point of light 1/4T;ksfr /;ku1/2] Concentration on feeling 1/4Hkko /;ku1/2] Concentration on figure 1/4ewÜkZ /;ku1/2-

**REFERENCES**

- (1) Yogic Materia Medica
- (2) Asana, Pranayam and Bandh