

# *Chhattisgarh Swami Vivekanand Technical University, Bhilai*

## Scheme of Teaching and Examination

### B.E. IV Semester Electronics & Telecommunication Engineering

Sl. No.	Board of Study	Code No.	Subjects	Period Per Week			Scheme of Exam Theory/Practical			Total Marks	Credit L+(T+P)/2
				L	C	P	ESE	CT	TA		
1	Appl. Mathematics	328411 (14)	Mathematics IV	3	1	-	80	20	20	<b>120</b>	4
2	Electrical Engg.	328412 (24)	Electrical Machines	3	1	-	80	20	20	<b>120</b>	4
3	Electronic & Telecom.	328413 (28)	Analog Electronic Circuits	3	1	-	80	20	20	<b>120</b>	4
4	Electronic & Telecom.	328414 (28)	Digital Electronic Circuits	3	1	-	80	20	20	<b>120</b>	4
5	Electronic & Telecom.	328415 (28)	Signals and Systems	3	1	-	80	20	20	<b>120</b>	4
6	Electronic & Telecom.	328416 (28)	Industrial Transducers & Sensors	3	-	-	80	20	20	<b>120</b>	3
7	Electronic & Telecom.	328421 (28)	Analog Electronic Circuits Lab	-	-	4	40	-	20	<b>60</b>	2
8	Electronic & Telecom.	328422 (28)	Digital Electronic Circuits Lab	-	-	4	40	-	20	<b>60</b>	2
9	Electronic & Telecom.	328423 (28)	Programming Lab (C++ Language)	-	-	4	40	-	20	<b>60</b>	2
10	Electronic & Telecom.	328424 (28)	Industrial Transducers & Sensors Lab	-	-	2	40	-	20	<b>60</b>	1
11	Humanities etc.	300425 (46)	Health, Hygiene & Yoga	-	-	2	-	-	40	<b>40</b>	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>31</b>

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

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 Sem.**

Branch: **Electronics & Telecom., Applied  
Electronics and Instrumentation**

Subject: **Mathematics-IV**

Code: **328411(14)**

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.
3. Applied Mathematics for Engineers & Physicists by Louis A. Pipes- TMH.

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

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

Branch: **Electronics & Telecom.**

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 : **B.E. IV Sem.**

Subject: **Analog Electronic Circuits**

Total Theory Periods: **40**

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

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

Branch: **Electronics & Telecommunication**

Code: **328413 (28)**

Total Tutorial Periods: **10**

**UNIT-I**

**LOW FREQUENCY TRANSISTOR AMPLIFIER:** Graphical Analysis of CE amplifier; h-parameter Models for CB, CE, CC configurations and their Interrelationship; Analysis and Comparison of the three Configurations; Linear analysis of Transistor Circuits: Miller's Theorem: Cascading: Simplified Models and Calculation of CE and CC Amplifiers; Effect of emitter Resistance in CE amplifiers: Cascode amplifiers: Darlington Pair, analysis of Single stage FET amplifier-CS and CD Configuration, FET as VVR.

**UNIT-II**

**HIGH FREQUENCY TRANSISTOR AMPLIFIERS:** CE hybrid- $\pi$  model: Validity and parameter Variation: Current Gain with Resistive load: frequency response of a single stage CE Amplifier: Gain-Bandwidth product: CC stage High frequencies: Multistage Amplifiers: sources of Noise in Transistor Circuits; Noise Figure.

**UNIT-III**

**MULTISTAGE AMPLIFIERS:** Classification: Distortion in Amplifiers: Frequency Response: Bode plots: Step Response: pass band of Cascaded Stages: Response of a Two-stage RC Coupled Amplifier at Low and high frequencies: Multistage amplifiers: Sources of Noise in Transistor Circuits: Noise Figure.

**UNIT-IV**

**FEEDBACK AMPLIFIERS:** Classification: Feedback concept; Ideal Feedback amplifier: Properties of Negative Feedback Amplifier Topologies: Method of Analysis of Feedback amplifiers: Voltage series Feedback: Voltage series Feedback pair: Current series, Current shunt and Voltage shunt feedback; Effect of feedback on amplifier Bandwidth and stability.

**UNIT-V**

**OSCILLATOR:** Sinusoidal oscillator: phase shift oscillators, Wien Bridge oscillator: Resonant circuit oscillators: LC Collpit & LC Hartley, Amplitude Frequency and phase stability analysis of all Oscillators, General form of Oscillator Configuration; Crystal oscillator.

***Name of Text Books:***

1. Integrated Electronics – Millman & Halkias, TMH.
2. Microelectronics – Millman and Grabel, TMH.

***Name of Reference Books:***

1. Electronic Devices & Circuits – David A. Bell, PHI

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

Semester : **B.E. IV Sem.**

Subject: **Digital Electronic Circuits**

Total Theory Periods: **40**

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

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

Branch: **Electronics & Telecommunication**

Code: **328414 (28)**

Total Tutorial Periods: **10**

**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 and 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 : **B.E. IV Sem.**  
Subject: **Signals & Systems**  
Total Theory Periods: **40**

Branch: **Electronics & Telecommunication**  
Code: **328415 (28)**  
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 : **B.E. IV Sem.**

Branch: **Electronics & Telecommunication**

Subject: **Industrial Transducers & Sensors**

Code: **328416 (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**

Transducers classification, Transducers description, transducer sensitivity, transducer selection.

Resistive Transducers: Construction, Principle of operation and applications of Hot-wire, Displacement, Strain, Pressure, Moisture, Magnetic Flux, Optical radiation.

**UNIT – II**

**Inductive Transducers:** Construction, Principle of operation and applications of Thickness, Displacement, Movable Core type, Eddy current type.

**Capacitive Transducers:** Construction, Principle of operation and applications of Thickness, displacement and Moisture.

**UNIT – III**

**Piezoelectric Transducers:** Piezoelectric phenomenon, Piezoelectric materials, Force, Strain, Torque, Pressure and Acceleration transducers.

Magnetostrictive Transducers: Magnetostriction phenomenon, Force, Acceleration and Torsion transducers. Hall Effect Transducers.

**UNIT – IV**

**Electromechanical Transducers:** Tachometers, Variable reluctance, Electrodynamic vibration, Electrodynamic pressure, Electromagnetic flow meters.

**Photoelectric Transducers:** Photoelectric phenomenon, Photoconductive, Photovoltaic, Photoemissive.

**UNIT – V**

**Digital Transducers:** Digital displacement transducer, Digital tachometers.

Ionization Transducer: ionization vacuum gauge, Nuclear radiation transducer, Radioactive vacuum gauge.

**Electrochemical Transducers:** Basics of electrode potential, Reference electrodes, Indicator electrodes, pH electrode.

**Text Books:**

1. Murty, D.V.S.; *Transducers and Instrumentation*; PHI, 10<sup>th</sup> print 2003

2. Jain, R.K.; *Mechanical and Industrial Measurements*; Khanna Publ. 10<sup>th</sup> Edition- 4<sup>th</sup> reprint 2000

**Suggested Reference:**

1. Patranabis, D.; *Sensors and Transducers*; PHI, 2<sup>nd</sup> edition

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

Semester : **B.E. IV Sem.**  
Subject: **Analog Electronic Circuits Lab**  
Total Practical Periods: **36**  
Total Marks in End Semester Examination: **40**

Branch: **Electronics & Telecommunication**  
Code: **328421 (28)**

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

1. Static input characteristics curves of CE transistor.
2. Static output characteristic curve CE transistor.
3. Static input characteristic curve of CB transistor.
4. Static output characteristic curve of CB transistor.
5. To design and study the frequency response of single stage CE transistor amplifier.
6. To study the frequency response of RC coupled double stage CE transistor amplifier.
7. To study the frequency response of RC coupled double stage CE transistor amplifier with voltage feedback.
8. To study the frequency response of RC coupled double stage CE transistor amplifier with current feedback.
9. To plot the voltage gain vs. load characteristics of common collector (emitter follower) n-p-n transistor.
10. To study Wein Bridge Oscillator.
11. Experiment with emitter follower a voltage series feedback amplifier.
12. General study of pushpull audio power amplifier.
13. To study RC phase shift oscillator.
14. Study of various topologies of feedback amplifier.
15. Experiment with Darlington pair amplifier.

**List of Equipments/Machine Required:**

Circuit components, Power supply, CRO, Function generator, Multimeter, Breadboard.



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

Semester : **B.E. IV Sem.**

Subject: **Digital Electronic Circuits Lab**

Total Practical Periods: **36**

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

Branch: **Electronics & Telecommunication**

Code: **328422 (28)**

**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

**Recommended Books:**

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

Semester : **B.E. IV Sem.**  
Subject: **Programming Lab (C++ Language)**  
Total Practical Periods: **36**  
Total Marks in End Semester Examination: **40**

Branch: **Electronics & Telecommunication**  
Code: **328423 (28)**

**List of Programmes to be performed (but not less than 10)**

1. Write a program to define three functions with the same name `area()`, taking one, two and three arguments respectively. The function taking one argument will consider it as the side of a square and calculate area, the function with two argument will consider it the sides of a rectangle and the function with three arguments will consider will calculate the area of a cuboid.
2. Write a program to define a function a function power that will take two arguments base and exponent and return the value of base raised to the power exponent. The function should have a default value of base as 10.
3. Create a class `FLOAT` that has one data member float. Perform all arithmetic & relational operation for `FLOAT` class.
4. Write a program to define a class `Complex` that will simulate the Complex numbers of mathematics, containing real and imaginary as the data members. Define suitable constructors and a function that will display the data members.
5. Create a class for making a student's mark-sheet & include a static data member total marks to calculate average marks of a particular class.
6. Write a program to define two classes `Alpha` and `Beta` containing an integer each as data members. Define a function `Sum()` that will be a friend to both `Alpha` and `Beta`, that will take one object from each class as argument and return the sum of the data members of the argument objects.
7. Write a Program to define a class `Complex` that will contain real and imaginary as the data members. Define appropriate constructors and a display function. Overload the binary `+` and the `*` operator to add and multiply two complex numbers respectively.
8. Write a program to define a class `time` that will represent a time period in minutes and seconds. Overload the following operators for the following:
  - i. `++` Operator that will increment the seconds by 1
  - ii. `+` Operator that will add two objects of time class
9. Write a program to overload the comma operator for a class such that for the instruction `a = ( b,c )` the larger object of `a` and `b` is assigned to `a`
10. Write a program to define a class `Base` that will contain a protected integer data member and inherit this class in class called `Derived`. Override the display function of `Base` class and add a new member function in the `Derived` class so that it returns the factorial of the `Base` class member.
11. Write a program to define an abstract class `Person` that will contain the essential information like name, age and sex of a person. Now derive two classes `Student` and `Employee` both from the class `Person`. The class `Student` will contain the academic information such as roll number; school etc. and the class `Employee` will contain information such as department and salary. In the main function declare and array of `Person` pointers that can hold the address of either `Student` or `Employee` object. The program will ask the user to enter the details of `Students/Employees`, create dynamic objects of these classes using `new` operator and store them in the array. The program will then display the contents of these objects.
12. Write a program to that will ask the user to enter a file name and a line of text and transfer that line of text into a text file as named by the user.
13. Write a program that will ask the user to input a file name and copy the contents of that file into another file.

14. Write a program that will ask the user to enter the details of 5 employees and transfer the details into a binary file named as Emp.dat. Write another file that will read the details and print it.

...2/-

15. Write a program that will take the details of 10 students as input and transfer it into a binary file. Write another program that will provide a menu to the user for the following purposes:
- i. To display details of all the students
  - ii. To display details of all the students having total marks greater than a given value
  - iii. To sort the file on the basis of Roll number of students
  - iv. To sort the file on the basis of Total marks of students
  - v. To update the record for a particular student
  - vi. To delete the record for a particular student
  - vii. To search the details of a particular student on the basis of Roll number or Name

**List of Equipments/Machine Required:**

PCs, C++ Compiler

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

Semester : **B.E. IV Sem.**

Subject: **Industrial Transducers & Sensors Lab**

Total Practical Periods: **36**

Branch: **Electronics & Telecommunication**

Code: **328424 (28)**

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

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

**List of Equipments/Machine Required:**

1. Measurement of linear displacement using linear variable differential transformer (LVDT)
2. Measurement of displacement using light dependent resistor (LDR)
3. Measurement of speed of motor shaft with the help of non contact type of pickup
4. Variable reluctance tachometer
5. Photo electric pickup and also plot the graphs and percentage error from
6. To study the characteristics of filament lamp
7. To study the characteristics of photovoltaic cell
8. To study the characteristics of photoconductive cell
9. To study the characteristics of photo-transistor
10. To study the characteristics of optically controlled switching system
11. To study the characteristics of IC temperature sensor (LM 335)
12. To study the characteristics of NTC bridge circuit
13. To study that the thermistor is one of the feedback resistance in a non inverting op-amp circuit
14. To demonstrate how a standard diode can be used as a thermoresistive or thermoelectric device.
15. To demonstrate the use of a general purpose transistor as a temperature sensor.
16. To study the LVDT characteristics.
17. To study LDR as part of a voltage divider.

**List of Equipments/Machine Required:**

Transducers, Circuit Components, CRO, Power supply, Function generator

**CHHATTISGARH SWAMI VIVEKANAND TECHNICAL UNIVERSITY,  
BHILAI**

Semester : B.E. IV Sem.  
Subject : **HEALTH, HYGIENE & YOGA**  
No. of Periods : 2 pds/week  
Total Marks in End Semester Exam. : NIL  
Minimum number of class tests to be conducted: Two

Branch: Common for all branches  
Code : 300425 (46)  
Tutorial Periods : NIL  
Teacher's Assessment: 40 Marks

**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 Alopathy, Ayurved, homocopathy, 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, Matsyarakrisana, Shashankasana.
- **Asans to increase memory and blood supply to brain :** Shirshasana, Shashankasana.
- **Asans for eye sight:** Tratak, Neti Kriya .
- **Pranayama :** Definition and types : Nadi Shodhan, Bhastrika, 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 1/4fnkdk'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, Pranayama and Bandha