Chhattisgarh Swami Vivekanand Technical University, Bhilai

SCHEME OF TEACHING & EXAMINATION

B.E. VI SEMESTER ELECTRICAL & ELECTRONICS ENGINEERING.

S.No.	Board of Study	Subject Code	Subject	Periods per week			Scheme of Exam			Total Marks	Credit d L+ (T+ P) / 2
				L	T	P	Theory/ Practical				
							ESE	CT	TA		
1	Electrical & Electronics Engg.	325611 (25)	Power System Engineering	3	1	-	80	20	20	120	4
2	Electrical & Electronics Engg.	325612 (25)	Non Conventional Energy Sources	3	1	-	80	20	20	120	4
3	Electronics & Telecom. Engg.	328613 (28)	Advanced Micro processor & Interfacing	3	1	-	80	20	20	120	4
4	Electrical Engineering	324613 (24)	Power Electronics	3	1	-	80	20	20	120	4
5	Electrical Engg.	324615 (24)	Digital Signal Processing	3	1	-	80	20	20	120	4
6	**Refer Table -1**		Professional Elective -1	3	-	-	80	20	20	120	3
7	Electrical & Electronics Engg.	325621 (25)	Digital Signal Processing Lab	-	-	3	40	-	20	60	2
8	Electrical & Electronics Engg.	325622 (25)	Power System Simulation Lab	-	-	3	40	-	20	60	2
9	Electrical & Electronics Engg.	325623 (25)	Industrial & Power Electronics Lab	-	-	4	40	-	20	60	2
10	Electrical & Electronics Engg.	325624 (25)	Advanced Microprocessor & Interfacing Lab	-	-	4	40	-	20	60	2
11	Management	300625 (36)	Managerial Skills	-	-	2	-	-	40	40	1
12			Library	-	-	1	-	-	-	- -	-
			Total	**18**	**5**	**17**	**640**	**120**	**240**	**1000**	**32**

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

Note : Industrial Training of twelve weeks is mandatory for B.E. students. It is to be completed in two equal parts. The first part must have been completed in summer after IV sem. The second part to be completed during summer after VI sem. after which students have to submit a training report which will be evaluated by college teachers during B.E. VII sem.

Table -1
Professional Elective –I

S.No.	Board of Study	Subject Code	Subject
1	Electronics & Telecom. Engg.	328633 (28)	Medical Electronics
2	Electronics & Telecom. Engg.	328636 (28)	Computer Organization & Architecture
3	Electrical Engg.	324635 (24)	Testing & Commissioning of Electric Equipment
4	Electrical Engg.	324632 (24)	Power System planning & Reliability
5	Electrical Engg.	324633 (24)	Process Control
6	Electronics & Telecom. Engg.	328637 (28)	Advanced Semiconductor Devices

Note (1)- 1/4th of total strength of students subject to minimum of twenty students is required to offer an elective in the college in a particular academic session.

Note (2) - Choice of elective course once made for an examination cannot be changed in future examinations.

Chhattisgarh Swami Vivekanand Technical University, Bhilai (C.G.)

Semester: B.E. VI Sem. **Branch: Electrical & Electronics Engg.**
Subject: Power System Engineering **Code: 325611(25)**
Total Theory Periods: 40 **Total Tutorial Periods:12**
Total Marks in End SEM Exam: 80
Min no. of class Test to be conducted: Two

Unit 1- **Representation of Power System**: Single line diagram, impedance diagram, reactance diagram, equivalent impedance of three phase transformer, per unit quantities, P.U. impedance of three phase transformer, positive sequence impedance diagram in per unit system, Expression for three phase power in P.U.

Unit 2- **Symmetrical Components**: Expression for positive, negative & zero sequence components, existence of sequence components of current & voltages for three phase circuit, sequence impedance of alternator & transmission line, Sequence network of unloaded generator, zero sequence network of three phase transformers, phase shift in star-delta transformer.

Unit 3-**Fault Calculations**: Single line to ground fault, Line to line fault, Double line to ground fault on unloaded generator, faults through impedance, open conductor faults, unsymmetrical fault on power system, Three phase short circuit on synchronous machine, Three phase short circuit on power system, Calculation of different current ratings and interrupting capacity of circuit breaker.

Unit 4- **System Stability** : Steady state and transient stability, steady state stability limit, swing equation, equal area criteria of stability, critical clearing angle, swing equation for multimachines system, Methods of improving transient stability, Power system grounding, ungrounded neutral system, solid grounding, resistance grounding ,reactance grounding, arc suppression coil grounding, Earthing transformer.

Unit 5- **Economic operation of power systems**: Input output curves , criteria for economical distribution of power between generating units in a plant, Expression for transmission line loss in terms of loss formula coefficients, criteria for economical distribution of power between generating plants, load dispatching(brief aspects), **Load flow studies**: bus admittance matrix, formation of load flow equation, computation techniques, Gauss Siedel method, Newton Raphson method, control of active & reactive power in interconnected systems.

Text Books-

1. Elements of power system analysis By W.D. Stevensons (4th Ed. Mc Graw Hill)
2. Electrical Power System by Ashfaq Hussain (4th Ed. CBS Pub. & Dist.)

Reference books

1. Power System Analysis and Design by B.R. Gupta (3rd Ed S. Chand)
2. Power System Engg. By I.J. Nagrath & Kothari (Tata McGraw Hill)
3. Power System Engg. BY A. Chakrabarti, M.L. Soni,P.V.Gupta, V.S.Bhatnager(6th Ed Dhanpat Rai & Co.)

Chhattisgarh Swami Vivekanand Technical University, Bhilai (C.G.)

Semester: B.E. VI Sem. **Branch: Electrical & Electronics Engg.**
Subject: Non Conventional Energy Sources **Code: 325612(25)**
Total Theory Periods: 40 **Total Tutorial Periods:12**
Total Marks in End Sem Exam: 80
Min no. of class to be conducted: Two

Unit: 1
Introduction : Various non-conventional energy sources, Need, availability, classification, Relative merits & demerits. Energy storage, distribution and conservation.

Unit: 2
Solar Energy: Solar Cells; Theory of Solar Cells, Materials, Solar Cell Power Plants, merits / demerits. Solar Thermal Energy : Solar energy collectors, Applications, storage, Solar Thermal Power Plants, merits / demerits.

Unit: 3
Wind Energy: Basic Principles of Wind Energy conversion Site Selection criterion ,wind Data & Energy Estimation, Types of Rotors, Characteristics, performance & limitations of energy conversion systems.

Unit: 4
Tidal Energy: Basic Principles, Components of Tidal Plants, Operation methods & utilization,
Bio-Mass Energy – Conversion Technology, Classification of Plants, Advantages & Disadvantages
Geo-Thermal Energy – Sources of Geo- Thermal energy, Thermal energy conversion- electrical / Non electrical conversion. Advantage & Disadvantages.

Unit: 5
MHD Power Generation – Principle of working open cycle / close cycle system. Advantages & Disadvantages Thermo Electric Power – Basic Principles, Thermo Electric Materials, Performance & Limitations.
Thermionic Conversion – Principles of working.
Hydrogen Energy – Principles of conversion ,production of H_2.

Text Books: **1.** G.D. Rai – Non Conventional Energy Sources –(4^{th} ed Khanna Pub.)
2. S.P. Sukhatme – Solar Energy – TMH.

Reference: **1.** Bansal, Kleemann & Meliss – Renewable Energy Sources & Conversion Technology – TMH.

Chhattisgarh Swami Vivekanand Technical University, Bhilai (C.G.)

Semester: B.E. VI Sem. **Branch: Electrical Engg.**
Subject: Power Electronics **Code: 324613 (24)**
Total Theory Periods: 40 **Total Tutorial Periods: 12**
Total Marks in End Sem Exam: 80
Min no. of class Test to be conducted: Two

UNIT I: Thyristor
Silicon controlled rectifier (SCR), construction and principle of operation, two-transistor analogy, static and dynamic characteristics, gate characteristics, ratings, series and parallel operation of SCRs, over voltage and over current protections, protection against high di/dt and high dv/dt, use of UJT for pulse generation.

UNIT II: Phase Controlled Rectifiers
Principle of phase control, performance parameters, single-phase half wave and full wave controlled rectifiers, mid point and bridge converters, full controlled converters, half controlled converters, comparison between full and half controlled converters, three-phase half wave and fully controlled bridge converter, three-phase semi-converter, effect and source inductance in single-phase and three-phase bridge converters, commutation or overlap angle, effect of overlap.

UNIT III: DC To DC Conversion
Principle of chopper operation, controlled strategies, step up chopper, step down chopper, chopper configuration, forced commuted chopper, voltage commutated chopper, current commuted chopper, Load commuted chopper, Jone's chopper, Morgan chopper.

UNIT IV: Inverter
Classification of inverters, voltage source inverter, current source inverter, series resonant inverter, modified series resonant inverter, parallel inverter, bridge inverter, auxiliary commuted single-phase inverter, complementary commuted singe-phase inverter, and three-phase inverter, Cyclo-converters: basic principle of operation, step-up and step down single-phase to single-phase Cyclo-converter.

UNIT V: Speed Control Of DC Motors
Four-quadrant operation of series and shunt DC motors, constant HP and constant torque operation, various schemes of speed control (single converter, double converter, chopper), modern semiconductor devices, power transistors, power bipolar junction transistors, steady state characteristics, switching characteristics, switching limits, safe operating area, power MOSFET: steady state characteristics, switching limits, safe operating area, IGBT: steady state characteristics, safe operating area.

Text Books:

1. "Power electronics", Rashid, PHI pbs.
2. "An introduction to thyristor and its applications", Ramamurthy, EWP.

Reference Books:

1. "A text book of power electronics", S.N Singh, Dhanpat Rai.
2. Power electronics, Murthy, Oxford.
3. "Power electronics", P. C. Sen, TMH.

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

Semester : VI **Branch:** ET&T/AEI/EI/**EEE**
Subject: Advanced Microprocessors & Interfacing **Code: 328613 (28)**
Total Theory Periods: 40 **Total Tutorial Periods: 12**
Total Marks in End Semester Examination: 80
Minimum number of Class tests to be conducted: Two

Unit – I

Architecture & Instruction set for 8086: Architecture and pin configuration of 8086, Instruction Format; Addressing modes, Data Transfer Instruction; Arithmetic Instructions; Branching and Looping Instructions, NOP and Halt, Flag Manipulation Instructions; Logical, Shift and Rotate Instruction. Byte and String Manipulation: String Instructions; REP Prefix, Table Translation, Number Format conversions. Assembler Directives and Operators; Assembly Process; Translation of assembler Instructions. Programming of microprocessor 8086

Unit – II

System Bus Structure: Basic 8086/8088 system bus architecture, Minimum mode Configuration, Maximum mode configuration; memory interfacing with 8086/8088 in minimum and maximum mode; System Bus Timings, Bus Standards. Interrupts of microprocessor 8086

Unit – III

Architecture of Interfacing Devices: Programmable interrupt controller (PIC) 8259, Programmable DMA Controller (8257). *(Architecture and Functioning only)* 8-bit ADC and DAC, Programming for Interfacing of 8253/8254, 8251, 8279, ADC and DAC with 8086.

Unit – IV

Architecture of 32 bit Microprocessors: Intel 80386 Architecture –Special 80386 Registers –Memory management – interrupts and exceptions – management of tasks –Real, protected and virtual 8086 mode- Introduction to 80486 microprocessor – Architecture – Comparison with 80386 processor. Introduction to RISC and CISC Processor

Unit – V

Multiprocessor Architecture & Programming: Numeric data Processor 8087; I/O Processor 8089, Communication between CPU and I0P, Related Instructions; programming of 8087 numeric data processor.

Name of Text Books:

1. Microcomputer Systems: 8086/8088 Family - Architecture, Programming, and Design; Y. Liu and G. A. Gibson, 2nd Ed., PHI.
2. Microprocessor & Interfacing – D. Hall, TMH

Name of Reference Books:

1. The 8086 Microprocessor: Programming & Interfacing the PC, Kenneth J. Ayala, Penram International Publishing (India).
2. The Intel 8086/8088 Microprocessor Architecture, Programming Design & Interfacing – B.S. Chhabra, Dhanpat Rai Publishing Company.
3. The Intel Microprocessor 8086/8088, 80186/80188, 80286, 80386, 80486, Pentium & Pentium Pro Processor: Architecture, Programming & Interfacing – Brey & Sharma, Pearson Education.
4. Advanced microprocessor, Rajasree, New Age International Publishers

CHHATTISGA RH SWAMI VIVEKANAND TECHNICAL UNIVERSITY, BHILAI (C.G.)

Semester: 6th **Branch:** EE&**EEE**
Subject: Digital Signal Processing **Code: 324615 (24)**
Total Theory Periods: 40 **Total Tut Periods: Nil**
Total Marks in End Semester Exam: 80
Minimum number of Class tests to be conducted: 2

Unit-I: Classification of signals and systems:
Introduction, Classification of signals, singularity Functions, Amplitude and Phase Classification of systems, simple Manipulation of discrete- time signals, Representation of Systems, Analog- to-Digital Conversion of signals.

Unit-II: Linear Time Invariant systems:
Introduction, Properties of DPS systems, Difference equation and its Relationship with system function, Impulse Response and Frequency Response, Frequency Response.

Unit-III: Discrete and Fast Fourier Transforms:
Introduction, Discrete Convolution, Discrete- Time Fourier Transform (DTFT), Fast Fourier Transform (FFT), Computing of inverse DFT by Direct DFT, Composite- radix FFT, Fast (Sectioned), Convolution, and correlation.

Unit-IV: Infinite Impulse Response (IIR) Filters:
Introduction, IIR Filters Design by Approximation of derivatives, IIR Filter Design by Impulse invariant Method, IIR Filter Design by the Bilinear Transformation, Butter worth Filters Chebyshev Filters, Inverse Chebyshev Filters, Elliptic Filters, Frequency Transformation.

Unit-V: Realization of Digital Linear systems :
Introduction, Basic Realization Block Diagram, Signal-flow Graph, Basic structure for HR systems, Basic Structure for FIR Systems. Application of Digital signal Processing, Introduction, Voice Processing, Application to Radar, Application to Image processing, Introduction to Wavelets.

Text Books:

1. Digital Signal Processing – S.Salivahanan, A. Vallavraj, C. Gnanapriya TMH
2. Digital Signal Processing principles, algorithms and applications, Proakis, Pearson Education.
3. Signal and systems, Oppenheim, PHI

Reference books:

1. Digital Signal Processing – A.V. Oppenheim, Schaffer, PHI
2. Digital Signal Processing, Johny, Johnson, PHI.

CHHATTISGA RH SWAMI VIVEKANAND TECHNICAL UNIVERSITY, BHILAI (C.G.)

Semester : VI

Branch: Electrical & Electronics Engg. and Electronics & Telecommunication

Subject: Medical Electronics
Code: 328633 (28)
Total Theory Periods: 40
Total Tutorial Periods: Nil
Total Marks in End Semester Examination: 80
Minimum number of Class tests to be conducted: Two

UNIT – I

Man Instrument System: Introduction to Man-Instrument System, Components of Man-Instrument System, Physiological System of the Body, Problems Encountered in Measuring a Living System.

UNIT – II

Bio Electric Potential: Sources of Bioelectric Potential, Bio Electrodes, Cardiovascular Measurements: The Heart and Cardiovascular System, Electrocardiography.

UNIT – III

Measurements of Biological Parameters: Measurement of Blood Flow, Measurement of Heart Sound, Measurement of Temperature, Ultrasonic Diagnosis.

UNIT – IV

Patient Care and Monitoring: The Elements of Intensive Care Monitoring, Pacemakers, Defibrillators, Electrical Safety of Medical Equipment.

UNIT – V

Biotelemetry: Introduction, Physiological parameters Adaptable to Biotelemetry, The components of a Biotelemetry System, Implantable Units, Applications of Telemetry in Patient care.

Name of Text Books:

1. Biomedical Instrumentation & Measurement by L. Cromwell, F.J. Weibell and E.A. Pfeiffer, 2nd Ed., PHI
2. Principles of Medical Electronics & Biomedical Instrumentation, C Raja Rao & S.K Guha, University Press

Name of Reference Books:

1. Electronics in Medicine and Biomedical Instrumentation – Nandini K. Jog, PHI
2. Biomedical Instrumentation – Dr. A. Arumugam, Anuradha Agencies, Chennai.
3. Handbook of Biomedical Instrumentation by R.S. Khandpur, TMH Pub. Co.
4. Introduction to Biomedical Engineering, Domach, Pearson Education

CHHATTISGA RH SWAMI VIVEKANAND TECHNICAL UNIVERSITY, BHILAI (C.G.)

Semester : VI

Branch: Electrical & Electronic Engg. and Electronics & Telecommunication

Subject: Computer Organization & Architecture
Code: 328636 (28)
Total Theory Periods: 40
Total Tutorial Periods: Nil
Total Marks in End Semester Examination: 80
Minimum number of Class tests to be conducted: Two

Unit I

Central Processor organization: Bus organized computer, Memory address structure, Memory data register, program counter, Accumulator, Instruction register, Program counter, Accumulator, Instruction register, Instruction field, Micro operations, Register transfer languages, Instruction field, Decoding and execution, Instruction formats and addressing modes.

Unit II

Control unit organization: Instruction sequencing, Instruction interpretation, Hardwired control, Micro-programmed control organization, Control memory, Address sequencing, Micro-instruction, Formats, Micro-program sequence, Microprogramming.

Unit III

Arithmetic processor design: Addition and subtractions algorithm, Multiplication algorithm, Division algorithm Processor configuration, Design of control unit and floating point arithmetic.

Unit IV

Input Output organization: Programmed I/O., I/O, addressing, I/O instruction, Synchronization, I/O interfacing, Interrupt mechanism, DMA, I/O processors and data communication, RISC, CISC, Loosely Coupled & Tights Coupled system.

Unit V

Memory organization and multiprocessing: Basic concepts and terminology, Memory hierarchy, Semiconductor memories (RAM, ROM), Multiple module, Memories and interleaving (Virtual memory, Cache memory, Associative memory), Memory management hardware requirements, RISC & CISE Processor.

Name of Text Books:

1. Computer System Architecture by M. Morris Mano, PHI
2. Computer Organization Architecture by J.P. Hayes, PHI

Name of Reference Books:

1. Digital Computer Logic Design By M. Morris Mano, PHI
2. Structured Computer Organization by Andrew S. Tanenbaum PHI
3. Computer Organisation and Design, Pal-Chauduri, PHI

CHHATISGARH SWAMI VIVEKANAND TECHNICAL UNIVERSITY, BHILAI (C.G.)

Semester: 6th **Branch: Electrical& Electronics Engg. and Electrical Engg.**

Subject: Testing And Commissioning Of Electrical Equipment **Code: 324635 (24)**
Total Theory Periods: 40
Total Marks in End Semester Exam: 80
Minimum number of Class tests to be conducted: 2

UNIT I: Power Transformers

Insulation resistance measurement and Meggering electrical equipment, temperature effect, polarization index, causes of poor insulation resistance, Drying out of transformer, Checks before paralleling, parallel operation Commissioning checks, Maintenance of transformer, maintenance of bushing and tap changers, Functions of breather, conservator, Troubles, Causes of failures, Ratings, Significance of impedance voltage, voltage regulation & vector diagram Ordering, Inspection, Storage, Handling, Transportation, civil works, site facilities, Commissioning, tests, Loading, capitalization of losses, Transformers oil: types, composition, properties, maintenance, testing, filtration, insulation resistance.

UNIT II: Instrument transformers/Traction, Rectifier Transformer

Current transformers (CT): applications, accuracy class, magnetization curve, burden, effect of open secondary, terms and definitions, type tests, routine tests on CTs, precautions, typical ratings, Voltage transformer (VT, PT): application, specifications, ratings, connections, accuracy class, and burdens, Types of VT construction

Traction transformers: Types, Special considerations, design and constructional features, Traction transformers for thyristor-controlled locomotives,

Rectifier transformers: comparison between rectifier transformer and power transformer, utility factor, design feature of rectifier transformer, transductors.

UNIT III: Rotating machines

Troubles with D.C. Machines and Remedies

Troubles with Commutator, Brushes and Brushes- gear Sparking, Commutator Defects, Brush pressure, Adjustments, Brush Alignment, Brush Angle, Neutral Position, Maintenance of Commutator and Brushes, Troubles with D.C. Motors, Test to detect the causes of the troubles, Earth-fault Test, Important Checks and Tests.

Testing of Induction Motors: Type Tests, Routine Tests, Commissioning Tests, Degree of Protection, Noise and its Control, Frame Sizes, Ratings, , Explosion Proof Motor.

Installation and Commissioning of Induction Machines and Rotating Machines: Despatch from Factory to Final Commissioning at site, Foundation and civil Work, Installation of Fully Assembled Machines, Preparations, Procedure Dismantling, Installation of Large Rotating Machines, Bed plate, Checks.

UNIT – IV:

Drying-Out of Electrical Rotating Machines and Insulation Resistance Measurements

Steps in drying-Out, Applying Heat, Measurements, Permissible Temp-rise, Log-sheets, Insulation Resistance, Power Required, Period of Drying Out, Polarisation Index, Significance, Vibration & Its Effects, Rotor Balancing, and Maintenance of motors.

Degree of protection Cooling Systems, Enclosures for Industrial Rotating Machines: Definition of Degree of Protection and cooling Systems, standard IP codes, Cooling Systems, Definition, Types, Standard Designations, IC Code, Ratings of Industrial Rotating Machines: Thermal Rating, Operation Duties, Duty factor, Continuous Rating, Intermittent Duty, Short Time Duty STR, DTR, MCR.

UNIT – V: Safety Precautions and live line Maintenance

Shocks, Safety procedures, Permission to work, Safety Clearances, Procedures, Permit to work, Electric Field and Clearances, Live Line Maintenance, Hot-Line Maintenance, Safety, tools, Degree of Exposures, Biological effects of Electric Field, Electric shock and effects.

TEXT BOOKS: -

1. Testing Commissiong Operation & Maintenance of Electrical Equipment – S.Rao
2. Transformers – Tata McGraw-Hill Publishing Company Limited

CHHATISGA RH SWAM I VIVEKANAND TECHNI CAL U NIVERSITY, BHILAI (C.G.)

Semester: 6th **Branch: Electrical & Electronics Engg. and Electrical Engg.**

Subject: Power System Planning & Reliability **Code: 324632 (24)**
Total Theory Periods: 40
Total Marks in End Semester Exam: 80
Minimum number of Class tests to be conducted: 2

UNIT – I
Review of probability theory element of probability theory Probability distribution, Random variable, Density & distribution functions, Mathematical expectation, Binominal distribution, Possion distribution, Normal distribution, Exponential distribution, and Weibull distribution.

UNIT – II
Reliability of engineering systems Component reliability, Hazard models, Reliability of systems with non-repairable components, series, parallel, series-Parallel, Parallel-Series configurations, Non-series-parallel configurations, Minimal tie-set, minimal cut-set and decomposition methods, Repairable systems, MARKOV process, Long term reliability Power System reliability.

UNIT – III
Reliability of engineering systems Reliability model of a generating unit, State space methods, Combining states, Sequential addition method, Load modeling, Cumulative load model, Merging of generation and load models, Loss of load probability, percentage energy loss, Probability and frequency of failure, operating reserve calculations.

UNIT –IV
Power Network Reliability Weather effect on transmission lines, Common mode failures, Switching after fauls, three, state components, Normally open paths, Distribution system reliability.

UNIT – V
Composite System Reliability Bulk Power supply systems, Effect of varying load, Inter connected systems, Correlated and uncorrelated load models, cost and worth of reliability.

UNIT – VI
Reliability Improvement & Testing proper Design simplicity, Component improvement Testing Plans, time censored & sequential reliability tests, accelerated life test, environment test, Reliability estimations.

Textbooks:

1. J.Endreny, Reliability Modeling in Electric Power Systems, John Wiley & Sons.
2. Roy Billinton & Ronald, Nallan, Reliability Evaluation of Power systems, Plenum Press, New York

CHHATISGARH SWAMI VIVEKANAND TECHNICAL UNIVERSITY, BHILAI (C.G.)

Semester: 6th **Branch: Electrical & Electronics Engg. and Electrical Engg.**

Subject: Process Control **Code: 324633 (24)**

Total Theory Periods: 40

Total Marks in End Semester Exam: 80

Minimum number of Class tests to be conducted: 2

UNIT – I

Special characteristics of process systems large time constraints, interaction, multistage, pure lag, control loops for simple systems and their Dynamics & stability.

UNIT – II

Generation of control action in electronic and pneumatic controllers, control valves, valves positiners, relief and safety valves, relays, volume boosters, pneumatic transmitters for process variable, Tuning of controllers – Zeigler Nichols and other techniques.

UNIT – III

Different control techniques and interaction of process parameters e.g. feed forward, cascade, ratio, over-ride controls, batch continuous process controls, Feed forward Control scheme.

UNIT – IV

Various process schemes / unit operations and their control schemes e.g. distillation columns, absorbers, heat exchangers, furnaces, reactors, mineral processing industries, etc. Use of control schemes for process optimization.

UNIT – V

Advanced control strategies with case studies, Use of DDC and PLC, Introduction to supervisory control, Conversion of existing control schemes in operating plants, data loggers.

Text Books:

1. Dale Patrick, Stephen Fardo, “Industrial Process Control system”.
2. Smith C.A. & A.B. Corripio,” Principal & Practiced Automatic Process Control”, J.Willey.

Reference books:

1. Shinskey F.G.” Process control System”, III Ed. McGraw Hill
2. Rao M & S.Qiv,”Process Control Engg.”Gorden & Breach

CHHATTISGA RH SWAMI VIVEKANAND TECHNICAL UNIVERSITY, BHILAI (C.G.)

Semester : VI **Branch: Electrical & Electronic Engg. and Electronics & Telecommunication**

Subject: Advanced Semiconductor Devices **Code: 328637 (28)**

Total Theory Periods: 40

Total Marks in End Semester Examination: 80

Minimum number of Class tests to be conducted: Two

UNIT – I

Metal Semiconductor Devices: Metal-vacuum boundary: Schottky effect, Metal-Semiconductor boundary: Ohmic contact, Current transport across a metal-semiconductor boundary, Metal-Insulator-Semiconductor (MIS) System, Metal-Semiconductor-Field -Effect-Transistor (MESFET), Charge Coupled Devices (CCDs)

UNIT – II

Semiconductor Tunnel Devices: Tunneling from the point of view of quantum measurement, Analysis of the Tunneling effect; Tunneling probability, Tunneling current density, Resonant tunneling. Tunnel Diodes; Qualitative and quantitative explanation of the Tunnel Diode I-V characteristics, Tunneling in a resonant tunneling diode, Indirect tunneling, Excess current, Thermal current in a tunnel diode, Dependence of tunnel diode characteristics on various parameters.

UNIT – III

Transferred – Electron Devices: Introduction, Transferred – Electron effect; Bulk Electron Negative Differential Resistivity, Modes of Operation; Ideal – Uniform Field mode, Accumulation Layer Mode, Transit Time Dipole Layer Mode, Quenched Dipole Layer Mode, Limited Space Charge Accumulated Mode. Device performances; Cathode Contacts, Power-Frequency Performance and Noise, Functional Devices.

UNIT – IV

MOSFET: Introduction, Basic Device Characteristics; Non-equilibrium condition, Linear and Saturation regions, Sub threshold region, Non-uniform Doping and Buried Channel Devices, Short-Channel Effects, MOSFET Structures; Scaled Down devices, HMOS, DMOS, Recessed-Channel MOSFET, Schottky-Barrier Source and Drain, Thin Film Transistor, SOI, VMOS, HEXFET.

UNIT – V

Transistor Structures: Electron Transport in short devices and Compound Semiconductor Technology, Permeable Base Transistors, Plannar Doped Barrier Devices, Real Space Transfer and Hot Electron Injection Transistors, Superlattice Devices.

Name of Text Books:

1. Physics of Semiconductor Devices, S.M Sze, Wiley Student Edition
2. Physics of Semiconductor Devices, Michael Shur, PHI

Name of Reference Books:

1. Physics of Semiconductor Devices**,** Dilip K. Roy, University Press
2. Semiconductor Devices-Modelling & Technology, Nandita Dasgupta & Amitava Dasgupta, PHI

CHHATTISGA RH SWAMI VIVEKANAND TECHNICAL UNIVERSITY, BHILAI (C.G.)

Semester: VI **Branch: Electrical & Electronic Engg.**
Subject: Digital Signal Processing Lab **Code: 325621 (25)**
Total Practical Periods: 40
Total Marks in End Semester Examination: 40

Experiments to be performed:

1. To generate Analog Signals.
2. To generate discrete sequences
3. To sample a sinusoidal signal at Nyquist rate
4. To convolve two given signals
5. To correlate two given signals
6. To design LPF using recursive structures
7. To design HPF using recursive structure
8. To design BPF using recursive structure
9. To design BSF using recursive structure
10. To design LPF using non-recursive structures
11. To design HPF using non-recursive structure
12. To design BPF using non-recursive structure
13. To design BSF using non-recursive structure
14. To design a digital notch filter and embed it on a digital signal processor block
15. Experimentation with application of DSP in Communication/Speech Processing/Image Processing

(Institutes may append more programmes/Experiments based on the infrastructure available)

List of Equipments/Machine Required:
C++ Compiler, MATLAB with Tool boxes, DSP Processor kit, Digital Storage CRO, Spectrum Analyzer.

Recommended Books:

1. Digital Signal Processing, Vallavaraj, Salivahanan, Gnanapriya, TMH

Chhattisgarh Swami Vivekanand Technical University, Bhilai (C.G.)

Semester: VI **Branch: Electrical & Electronics Engg.**
Subject: Industrial & Power Electronics Lab **Code: 325623 (25)**
Total Practical Periods: 50
Total Marks in End Sem Exam: 40

List of Experiments:

1. Study of RC firing circuit.
2. Study of UJT firing circuit.
3. Study of single-phase half-wave controller rectifier- using UJT.
4. Study of single-phase full-wave controller rectifier- using UJT.
5. Study of single-phase half-wave bridge controlled rectifier.
6. Study of single-phase full-wave bridge controlled rectifier
7. Study of three-phase half-wave controlled rectifier.
8. Study of three-phase full-wave controlled rectifier.
9. Study of DC Chopper power circuit.
10. Study of Series inverter circuit.
11. Study of parallel inverter circuit.
12. Study of single phase Mc murray bed ford inverter power circuit.
13. Study of three phase Mc murray bed ford inverter power circuit.
14. Speed control of three-phase induction motor.

CHHATTISGA RH SWAMI VIVEKANAND TECHNICAL UNIVERSITY, BHILAI (C.G.)

Semester: VI **Branch: Electrical & Electronic Engg.**
Subject: Advanced Microprocessor & Interfacing Lab **Code: 325624 (25)**
Total Practical Periods: 50
Total Marks in End Semester Examination: 40

Experiments to be performed:

1. To write a program to perform subtraction X-Y where X and Y are 48 bit numbers.
2. To write a program to multiply 4 and 5 in ASCII and store the result.
3. To find the largest number from a block of 15 bytes
4. To find the smallest number from a block of 15 bytes
5. To write a program to add series of 20 bytes.
6. A block of 200-signed bytes is present in memory from address BA: EA add all the positive bytes and store 8 bit signed result in memory after this block.
7. To write a program to compare two data blocks.
8. To write a program to scan for a specific word in the block and to store the location of the word at a suitable memory location.
9. To write an assembly language program to solve following arithmetic equation: 3AX+5DX+BP.
10. To write a program to arrange a data block in ascending order.
11. To write a program to arrange a data block in descending order.
12. To write a program to convert an 8-bit BCD number into its equivalent binary.
13. To write a program to insert a specific data byte under certain given conditions.
14. To write program to input a 4 bit BCD number, look up the seven segment code for this number and output to the display.
15. To write a program to count the number of odd and even bytes in a data block.

List of Equipments/Machine Required:
8086 Microprocessor kit, Keyboard, Assembler, PCs.

Recommended Books:
The Intel 8086/8088 Microprocessor Architecture, Programming, Design and Interfacing – Bhupinder Singh Chhabra, Dhanpat Rai Publications.

Chhattisgarh Swami Vivekanand Technical University, Bhilai (C.G.)

Semester: B.E. VI Sem. **Branch: Electrical & Electronics Engg.**
Subject: Power System Simulation lab **Code: 325622(25)**
Total Practical Periods: 40 **Total Marks in End Sem Exam: 40**

List Of Experiments

1. To develop single line diagram for a given power system
2. To feed data input to the single line diagram & display it.
3. To determine load flow current data for the given single line diagram.
4. To determine load flow power data for the given single line diagram.
5. To determine per unit values of all variable in the given single line diagram.
6. To calculate KVA & power factor rating of Synchronous Machine to be installed at specified bus bar to improve power factor for the specified limit.
7. To Connect two separate single line diagram representing different power system and study balance study system of the resultant.
8. To calculate fault KVA, SLG & LLG, negative & zero sequence current and negative and zero sequence reactance for the given single line diagram.
9. To determine transient motor starting characteristics.
10. To determine harmonic analysis of the harmonic in a bus bar for a given single line diagram.

Chhattisgarh Swami Vivekanand Technical University, Bhilai (C.G.)

Semester: VI
Subject: Managerial Skills
Total Practical Periods: 28
Total Marks in End Semester Exam: Nil
Minimum number of class test to be conducted: 2

Branch: Common to all branches
Code: 300625 (36)
Total Tut Periods: NIL

Unit-I
Managerial Communication Skills: Importance of Business Writing: writing business letters, memorandum, minutes, and reports- informal and formal, legal aspects of business communication, oral communication- presentation, conversation skills, negotiations, and listening skills, how to structure speech and presentation, body language.

Unit-II
Managerial skills: Leadership: Characteristics of leader, how to develop leadership; ethics and values of leadership, leaders who make difference, conduct of meetings, small group communications and Brain storming, Decision making, How to make right decision, Conflicts and cooperation, Dissatisfaction: Making them productive.

Unit-III
Proactive Manager: How to become the real you: The journey of self-discovery, the path of self-discovery, Assertiveness: A skill to develop, Hero or developer, Difference between manager and leader, Managerial skill check list, team development, How to teach and train, time management, Stress management, Self assessment.

Unit-IV
Attitudinal Change: Meaning of attitude through example, benefits of positive attitude, how to develop habit of positive thinking, what is fear? How to win it? How to win over failure? How to overcome criticism? How to become real you? How to Motivate?

Unit-V
Creativity – a managerial skill, Trying to get a grip on creativity.
Overview of Management Concepts: Function of Management: Planning, organizing, staffing, controlling.

Text & Reference Books:

1. Basic Managerial skills for all by E.H. McGrawth, Prentice Hall India Pvt Ltd,2006
2. How to develop a pleasing personality by Atul John Rego, Better yourself bools, Mumbai, 2006
3. The powerful Personality by Dr. Ujjawal Patni & Dr. Pratap Deshmukh, Fusion Books, 2006
4. How to Success by Brian Adams, Better Yourself books, Mumbai, 1969