

CHHATTISGARH SWAMI VIVEKANAND TECHNICAL UNIVERSITY, BHILAI

Diploma in EEE

Semester : FIFTH

S No	Board of Study	Course Code	Course	Periods per Week (in hrs)			Scheme of Examination					Credit L + (T+P) /2	
							Theory			Practical			Total Marks
				L	T	P	ESE	CT	TA	ESE	TA		
1.	EEE	225511 (25)	Microprocessor & Microcontroller	4	1	-	100	20	10	-	-	130	5
2.	ET & T	228511 (28)	Instrumentation & Process Control	4	1	-	100	20	20	-	-	140	5
3.	ET & T	228512 (28)	Antenna & Microwave Communication	3	1	-	100	20	20	-	-	140	4
4.	Electrical	224513 (24)	Power Electronics	4	1	-	100	20	10	-	-	130	5
5.	Electrical	224515 (24)	Electrical Machines-II	4	1	-	100	20	10	-	-	130	5
6.	EEE	225521 (25)	Microprocessor & Microcontroller Lab	-	-	2	-	-	-	40	20	60	1
7.	ET & T	225522 (28)	Instrumentation & Process Control Lab	-	-	2	-	-	-	40	20	60	1
8.	EEE	225523 (25)	Antenna & Microwave Communication Lab	-	-	2	-	-	-	40	20	60	1
9.	Electrical	225524 (24)	Power Electronics Lab	-	-	2	-	-	-	40	20	60	1
10.	Electrical	225525 (24)	Electrical Machines-II Lab	-	-	3	-	-	-	40	20	60	2
11.	EEE	225526 (25)	Industrial Training			1				20	10	30	1
Total				19	05	12	500	100	70	220	110	1000	31

L : Lecture hours, T: Tutorial Hours, P : Practical Hours

ESE : End of Semester Exam, CT: Class Test, TA: Teachers Assessment

*Industrial Training: One month training will be organized after 4th sem exam and it's evaluation will be done in 5th Sem

CHHATTISGARH SWAMI VIVEKANAND TECHNICAL UNIVERSITY, BHILAI

SEMESTER : **V**
SUBJECT TITLE : **Microprocessor & Microcontroller**
CODE : **225511(25)**
BRANCH DISCIPLINE : **ELECTRICAL & ELECTRONICS ENGINEERING (Dip)**

TEACHING AND EXAMINATION SCHEME

Course code	Teaching scheme (Hrs./week)				Scheme of Examination						Credit [L+(T+P)] 2
	L	T	P	Total Hours	Theory			Practical		Total Marks	
					ESE	CT	TA	ESE	TA		
225511(25)	4	1	-	5	100	20	10	-	-	130	5
225521(25)	-	-	2	2	-	-	-	40	20	60	1

DISTRIBUTION OF MARKS AND HOURS:

S.No.	Chapter No	Chapter Name	Hours	Marks
1	1	8085 Processor Architecture	16	20
2	2	Instructions and Programming of 8085	16	20
3	3	Interfacing Devices Architecture	16	20
4	4	8051 Microcontroller Architecture	16	20
5	5	Instruction and Programming 8051	16	20
		Total	80	100

RATIONALE: The aim of this course is-

- To study the Architecture of microprocessor 8085 & microcontroller 8051
- To study the addressing modes & instruction set of 8085 & 8051.
- To develop simple applications by programming 8085 & 8051
- To understand basics of interfacing some common peripheral devices

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DETAILED COURSE CONTENTS

- Chapter – 1 8085 Processor Architecture**
- Introduction to Microprocessor
 - Block Diagram of 8085
 - Register of 8085
 - Pin Configuration
 - Instruction Cycle
 - Basic Instruction Timing Diagram
 - Data Transfer Scheme
- Chapter – 2 Instructions and Programming of 8085**
- Instruction Format
 - Addressing Modes
 - Instructions of 8085
 - Simple Programming
 - Interrupts of 8085
- Chapter – 3 Interfacing Devices Architecture**
- Architecture of 8155/56
 - Architecture of 8255
 - Architecture of 8254
 - Architecture of 8251
- Chapter – 4 8051 Microcontroller Architecture**
- Introduction to Microcontroller
 - Block Diagram of 8051
 - Register of 8051
 - Pin Configuration of 8051
 - Reset and Clocking Circuit
- Chapter – 5 Instruction and Programming 8051**
- Addressing Modes
 - Instructions of 8051
 - Simple Programming
 - Interrupts of 8051
 - Application of Microcontroller

SUGGESTED IMPLEMENTATION STRATEGIES

The implementation strategy to teach this course should be a good mix of the various teaching methods like lecture, question-answer, assignment and lab. work. More drill and practice of numerical will be useful. Home and classroom assignments would prove more useful to develop the analytical skills.

SUGGESTED LEARNING RESOURCES

- a) Textbooks mentioned in the references.
- b) Instruction manuals and brochures from instrument suppliers
- c) Periodicals like magazines, journals etc.
- d) OHP transparencies.

1. SUGGESTED REFERENCES

(a) Reference Books :

Sl. No.	Title	Author, Publisher, Edition & Year
1	Microprocessor Architecture Programming & Application.	Gaonkar, Ramesh S., Willey Eastern Publication, 1 st , 1989.
2	Introduction To Microprocessor	Mathur, Aditya P., Tata-Mc Graw Hills Pub. , 1 st , 1990
3	Introduction to Microprocessor: Software, Hardware Programming	Laventhall, Lance A. Prentice-Hall Pub. 1 st , 1988
4	Microprocessor and Digital Systems	Douglus V. Hall, Mc. Graw Hill Pub
5	Microprocessors & Interfacing	Dougus V. Hall Mc. Graw Hill Pub, 1 st , 1984
6	Microprocessors & Fundamentals	B. Ram, Dhanpat Rai & Sons Pub
7	Introduction to Microprocessor	Vibhuti
8	Microprocessor & Microcontroller	B. Ram.
9	Microprocessor and Microcontrollers	Krishna Kant, Eastern Company Edition, Prentice Hall of India, New Delhi, 2007.
10	The 8051 Micro Controller and Embedded Systems	Muhammad Ali Mazidi & Janice Gilli Mazidi, R.D. Kinley, , PHI Pearson Education, 5th Indian reprint, 2003.

(b) Others:

- VCDs.
- Learning Packages.
- Lab Manuals.
- Charts.

BRANCH DISCIPLINE: ELECTRICAL & ELECTRONICS ENGINEERING (Dip)

Subject: Microprocessor & Microcontroller Lab

Practical Code : 225521 (25)

Hours: 32

LIST OF PRACTICALS / TUTORIALS:

Microprocessor 8085 Programming

1. Addition of two 8-bit numbers
2. Addition of two 16-bit nos.
3. Subtraction of two 8-bit nos.
4. Subtraction of two 16-bit nos.
5. Multiplication of two 8-bit nos. using repeated Addition.
6. Division of two 8-bit nos.
7. Find 1's & 2's complement of a 8-bit & a 16-bit number
8. Find Larger No. of two 8-bit Numbers
9. Find largest smallest No. from an array
10. Transfer Block of data bytes from one memory location to another in same order & in reverse order.
11. Arrange data bytes in ascending / descending order.
12. Interfacing of IC 8255.
13. Interfacing of IC 8155.

Microcontroller 8051 Programming

1. Addition of two 8-bit numbers
2. Addition of two 16-bit nos.
3. Subtraction of two 8-bit nos.
4. Subtraction of two 16-bit nos.
5. Multiplication of two 8-bit nos. using repeated Addition.
6. Division of two 8-bit nos.

CHHATTISGARH SWAMI VIVEKANAND TECHNICAL UNIVERSITY, BHILAI

- A) **SEMESTER** : V
 B) **SUBJECT TITLE** : **INSTRUMENTATION & PROCESS CONTROL**
 C) **CODE** : **228511 (28)**
 D) **BRANCH/DISCIPLINE** : **ELECTRICAL & ELECTRONICS ENGINEERING**

E) RATIONALE:

It is difficult to name any branch of science and engineering where instrumentation and control is not at work recovering the vital information on which much of our engineering progress depends. The field of instrumentation may be divided in to two main segments. One relates to measurement and other relates to control. The integration of these two areas is attempted through strong emphasis on their interrelationship and elaboration of their respective merits. This course of instrumentation and process control develops an understanding of transducers, signal conditioner, control system, display devices and programmable logic controllers.

F) TEACHING AND EXAMINATION SCHEME:

Course Code	Periods/Week (In Hours) (Teaching Scheme)			Scheme of Examination						Credit L+(T+P)/2
	L	T	P	Theory			Practical		Total Marks	
				ESE	CT	TA	ESE	TA		
228511 (28)	4	1	-	100	20	20	-	-	140	5
225522 (28)	-	-	2	-	-	-	40	20	60	1

L : Lecture hours : T : Tutorial hours, P : Practical hours

ESE – End of Semester Exam.; CT – Class Test; TA- Teacher’s Assessment

G) DISTRIBUTION OF MARKS AND HOURS:

Sl. No.	Chapter No.	Chapter Name	Hours	Marks
1	1	Introduction to instrumentation & process control	10	15
2	2	Transducers	20	25
3	3	Control system	25	30
4	4	Programmable Logic Controllers (PLC)	25	30
		Total	80	100

H) DETAILED COURSE CONTENTS:

Chapter – 1 : Introduction to instrumentation & process control

- Need of instrumentation & control.
- Block diagram of a general instrumentation system and their broad functions
- Block diagram of instrumentation system for measurement of various non-electrical parameters.

Chapter – 2 : Transducers

- Classification of transducers
- Types of errors in transducers
- Application of transducers for the measurement of Length, Thickness, Displacement, Velocity, Force, Weight, Torque, Pressure, Level, Temperature, Strain, P.H. measurement, Speed etc.
- Selection of transducer for specific application.

Chapter – 3 : Control system

- Role of control system in instrumentation
- Open and close loop control system
- Different types of control system such as ON-OFF, Step, Continuous, PID control etc.
- Servomechanism and regulators with suitable examples
- Control components
- Construction. Working principle, merits and demerits and applications of following control components
 - AC, DC servo motor
 - Synchros
 - AC, DC tacho generators
 - Stepper motor
 - Solenoid valve, motorized valve, servo valve
 - Control transformer
 - Servo voltage stabiliser

Chapter – 4 : Programmable Logic Controllers (PLC)

- Electrical control system: control sequence, connections for controlling sequences
- Introduction to PLCs: need of PLC, function of PLC, advantages of PLC compared to Hard-Wired connections, components of PLC
- Programmable controllers: types of PLC, specification of a PLC, block diagram.
- PLC programming: programming device, PLC programming methodologies, ladder diagram, features of different PLC programming
- Ladder diagram: types of ladder diagram, symbols, frame work of a ladder diagram, draw equivalent wiring diagram for a ladder diagram (simple circuit)
- Programming the PLC: I/O numbering system, properties of ladder logic programmers, simple ladder logic diagram,
- Boolean logic programming: various Boolean function set and mnemonics, features of Boolean logic programming,
- Function block: features of function block programming, significance of function block, function chart programming
- PLC configuration: open-loop and closed loop control circuit, PLC counter, timer, communication between PLC-PLC and PLC counter

I) SUGGESTED INSTRUCTIONAL STRATEGIES:

- Lecture session with question and answer
- Use of audio visual aids
- Assignment on various topics
- Moreover, when teaching this course, more troubleshooting exercises have to given in laboratory.

J) SUGGESTED LEARNING RESOURCES.

(c) Reference Books :

S.N.	Title	Author, Publisher, Edition & Year
1	Instrumentation for Engineering Measurements	Cerni & Foster; Tata McGraw Hill, New Delhi 5 th ,1986
2	Electronic Instrumentation & Measurement Techniques	Cooper; Prentice Hall, New Delhi 8 th , 2000
3	Instrumentation for Engineering Measurements	Dally, J.W. & Others; John Wiley & Sons, New York 1 st ,1984
4	Introduction to Instrumentation and Control	Ghosh, A.K.; PHI, New Delhi 1992
5	Process Control Instrumentation Technology	Johnson, McGraw Hill, New York 1992
6	Instrumentation, Measurement & Feedback	Jones; McGraw Hill, New York 1 st ,1994
7	Electronic Instrumentation	Kalsi, J.S.; Tata McGraw-Hill, New Delhi 1995
8	Handbook of Bio-Medical Instrumentation	Khandpur; Tata McGraw-Hill, New Delhi 2001
9	Electronic Instrumentation	Malvino; Tata McGraw Hill, New Delhi 2 nd ,1987

10	Instrumentation Devices and Systems	Rangan, C.S., et al; Tata McGraw Hill, New Delhi 1990
11	Electronic Measurements & Instrumentation	Rao & Sutrave; Nirali Prakashan, Pune 2 nd ,1988
12	A course in Electrical & Electronic Measurements & Instruments	Sawhney; Dhanpat Rai & Sons, New Delhi 11 th ,2000
13	Industrial Instrumentation and Control	Singh, S.K.; Tata McGraw Hill, New York 1991

- (d) **Others:**
- Lab Manuals.

BRANCH DISCIPLINE: ELECTRICAL & ELECTRONICS ENGINEERING (Dip)

Subject: Instrumentation & Process Control Lab

Practical Code : 225522 (28)

Hours: 32

LIST OF PRACTICALS / TUTORIALS:

- a) Displacement measurement using LVDT
- b) Weight measurement using strain gauge bridge
- c) Speed measurement of motor using magnetic proximity switch
- d) Speed measurement of motor using photo electric pickup
- e) Temperature measurement using thermocouple
- f) Temperature measurement using resistance temperature detector
- g) Temperature measurement using thermistor
- h) Performance of piezo electric transducers
- i) Displacement measurement with help of light dependent resistor
- j) Displacement measurement using inductive pick up transducer
- k) Pressure measurement using load cell
- l) Liquid level measurement using capacitive type transducer
- m) Proportionate mode of control
- n) Proportionate + integral type control
- o) Proportionate + integral + derivative control
- p) Performance of data acquisition system

CHHATTISGARH SWAMI VIVEKANAND TECHNICAL UNIVERSITY, BHILAI

- A) **SEMESTER** : V
 B) **SUBJECT TITLE** : **ANTENNA & MICROWAVE COMMUNICATION**
 C) **CODE** : **228512 (28)**
 D) **BRANCH/DISCIPLINE** : **ELECTRICAL & ELECTRONICS ENGINEERING**

E) **RATIONALE:** The course aim is to provide up to date knowledge and skill in microwave communication since it is prominent medium of communication at higher frequencies. The course covers wave propagation techniques, antennas and microwave devices and sources. The emphasis has been given on operation and control of above devices. So that the student may acquire the skill to operate and control the microwave setups. The basic concept of transmission lines has also been highlighted.

F) **TEACHING AND EXMINATION SCHEME:**

Course Code	Periods/Week (In Hours) (Teaching Scheme)			Scheme of Examination						Credit L+(T+P)/2
	L	T	P	Theory			Practical		Total Marks	
				ESE	CT	TA	ES E	TA		
228512 (28)	3	1	-	100	20	20	-	-	140	4
225523 (25)	-	-	2	-	-	-	40	20	60	1

L: Lecture hours: T: Tutorial hours, P: Practical hours

ESE – End of Semester Exam; CT – Class Test; TA- Teacher’s Assessment

G) DISTRIBUTION OF MARKS AND HOURS:

Sl. No.	Chapter No.	Chapter Name	Hours	Marks
1	1	Wave propagation	12	25
2	2	Microwave devices and components	18	30
3	3	Microwave Measurement	10	20
4	4	Transmission Line & their characteristics	8	10
5	5	Antenna fundamental and their characteristics	16	15
		Total	64	100

H) DETAILED COURSE CONTENTS:

Chapter – 1 : Wave propagation

- Ground wave surface wave.
- Space- wave ionosphere, reflection in ionosphere.
- Skip distance and multihop transmission. Optimum frequency.
- Guided waves and wave-guides, concept, mode theory & its excitation, wave-guide components.

Chapter – 2 : Microwave devices and components

- Limitations of transistors at Microwave frequencies, Microwave transistors. Parametric amplifier, Tunnel diode Gunn effect Gunn diode oscillators avalanche effect IMPATT & TRAPATT PIN diode and their applications Stimulated emission of devices such MASERS & LASERS, T-junction magic Tee, Attenuators, Direction-couplers bends, Isolators & circulators.
- Generation of microwaves by tubes, limitation of conventional tubes, velocity modulation klystron amplifier, reflex klystron, magnetron, traveling wave tube (TWT), backward wave oscillator (BWO), their specification (e.g. power output, frequency etc.) uses and limitations. Power supply and their specifications.

Chapter – 3 : Microwave Measurement

- VSWR measurement, microwave power measurement, frequency measurement, measurement of attenuation.

Chapter – 4 : Transmission Line & their characteristics

- Propagation constants, Attenuations constant, characteristic impedance concept of incident and reflected wave. Standing wave and VSWR. Short circuit and open circuit line. Half wave quarter wave, eight wave line and their uses. Co-axial cable and their construction. Calculation of characteristic impedance of co-axial cable.

Chapter – 5 : Antenna fundamental and their characteristics

- Characteristic of various antennas and their specifications, behavior and uses at different frequencies.
- Functions of an antenna.
- Need of an antenna and design of the antenna for specific use.
- Radiation, Radiated field strength at a point, Radiation pattern, Elementary antenna, dipole antenna. Half wave antenna, directive resistance effective length of antenna, Beam width and Bandwidth of antenna. Distribution of voltage and current for half wave dipole. Antenna arrays, Broadside and end fire array orientation and polarization of antenna.
- Type of antenna, their uses. Broadcast, long wave, medium wave & short wave loop and helical antenna, Horn, Yagiuda, Folded dipole and Rhombic Antenna. Parabola reflector antenna and log periodic antenna.

I) SUGGESTED INSTRUCTIONAL STRATEGIES:

- Lecture session with question and answer
- Use of audio visual aids
- Assignment on various topics
- Moreover, when teaching this course, more troubleshooting exercises have to given in laboratory.

J) SUGGESTED LEARNING RESOURCES.

(e) Reference Books :

S. N.	Title	Author, Publisher, Edition & Year
1	Microwave Principle	Herbert J. Reich, C.B.S. Delhi
2	Antennas	John D.K. Kraw, T.M.H. Delhi
3	Electromagnetic theory, Components & Devices	Seeger J.A.
4	Electromagnetic theory	Franklin D.R.
5	Electromagnetic waves & Radiating System Ed2	Jordan BC & Balman K.G.
6	Theory & Electromagnetic waves - Acoordinate free approval	Chan H.C.
7	Microwave devices & circuits Ed. 2	LIAO S.Y.
8	Electromagnetic wave theory	WALT J.R.
9	Microwaves	Gupta K.C.
10	Elements of Microwave Engg.	Chatterjee R.

(f) Others:

- VCDs.
- Learning Packages.
- Lab Manuals.
- Charts.

BRANCH DISCIPLINE: ELECTRICAL & ELECTRONICS ENGINEERING (Dip)

Subject: Antenna & Microwave Communication Lab

Practical Code : 225523 (25)

Hours: 32

LIST OF PRACTICALS / TUTORIALS:

1. Performance of Gunn Diode & Gunn Oscillator.
2. Performance of Klystron & Reflex klystron tubes.
3. Study of Magnetron.
4. Study of Isolators, directional couplers (cross directional & multihole) slotted line & block diagram of basic microwave bench.
5. Performance of VSWR meter.
6. Measurement of frequency of microwave.
7. Measurement of guide wavelength.
8. Measurement of Standing wave ration (VSWR).
9. Measurement of reflection coefficient.
10. Measurement of cutoff wavelength (TE₁₀ mode) Using $C=2/(m/a) + (n/b)=2a$.
11. Study of E-plane, H-plane and Magic Tee's.
12. Performance of pin diode and pin modulator.
13. Measurement of guided power.
14. Measurement of attenuation in dB for a given component.
15. Study of wave-guide Horn-Antenna.
16. Measurement of load impedance.
17. Measurement of characteristics of klystron tube & Gunn Oscillator.
18. Measurement of radiation 7 diffraction through Horn - antenna's.
19. Assembling the microwave bench.
20. Study of UHF & VHF Transmitters.
21. Study of radiation pattern for different antennas.
22. Measurement of characteristic for different antennas.

CHHATTISGARH SWAMI VIVEKANAND TECHNICAL UNIVERSITY, BHILAI

- 1 **SEMESTER** : V
 2 **SUBJECT TITLE** : POWER ELECTRONICS
 3 **CODE** : 224513 (24)
 4 **BRANCH DISCIPLINE: ELECTRICAL & ELECTRONICS ENGINEERING**

5 TEACHING AND EXAMINATION SCHEME

Course code	Teaching scheme (Hrs./week)				Scheme of Examination						Credit L+(T+P)/2
	L	T	P	Total Hours	Theory			Practical		Total Marks	
					ESE	CT	TA	ESE	TA		
224513 (24)	4	1	-	-	100	20	10	-	-	130	5
225524 (24)	-	-	2	-	-	-	-	40	20	60	1

6 DISTRIBUTION OF MARKS AND PERIODS:

S. N.	Chapter No.	Chapter Name	Periods	Marks
1	1	Power Rectification	05	08
2	2	Controlled Rectification	10	12
3	3	Inverters	10	10
4	4	Converters	10	15
5	5	Regulated Power Supply	15	20
6	6	Speed Control of Motors	15	15
7	7	Microprocessor and Computers	15	20
		TOTAL	80	100

7 RATIONALE

The field of electronics is very vast and fastly developing. In modern industries most of the machines are electronically operated and controlled. It is therefore very essential that technicians are given a sufficient back ground of the subject. Power electronics to keep in pace the modern developments. Basic idea about microprocessor and microcontroller has also been included in the syllabus taking to the modern trend and application of computers in every field.

8 DETAILED COURSE CONTENTS

Chapter – 1 Power Rectification

- Need and advantages of polyphase rectification
- 3 Phase and 6 Phase H.W. and F.W. (bridge) rectifiers
- Derivation of Irms, Idc, Ripple factor, P.I.V. and efficiency for 3 ph. H.W. and F.W. rectifiers.

- Different transformers – double star, zig zag and branched connections – working and advantages .
- Transformer utility factor : PUF and SUF

Chapter – 2 Controlled Rectification

- Power controlling devices such as S.CR, and Triac Diac UJT
- Triggering circuits – phase shift, UJT, Schmitt trigger circuits
- Single phase, three phase H.W. and bridge rectifiers- Derivation of I_{dc} and I_{rms} .
- Applications of controlled rectifiers
- Series and parallel combination of SCRs.

Chapter – 3 Inverters

- Need of inversion
- Inverter circuits using SCR in series and parallel mode
- Circuit diagram of emergency tube light.

Chapter – 4 Converters

- Need of converter , types of converter (DC to DC and AC to AC)
- Block diagram of chopper
- Circuit diagrams of chopper using switching transistors and SCRs
- Need of commutation, methods
- Single phase and Three phase cycloconverter

Chapter – 5 Regulated Power Supply

- Need of regulation
- Zener regulated DC power supply and its limitations
- Working of shunt and series regulated power supply using transistor
- IC regulated power supplies (Circuit diagram)
- Block diagrams of (SMPS) switch mode power supply
- AC stabilizer using tap changer
- Block diagram of servo stabilizer.

Chapter – 6 Speed Control of Motors

- Advantages of speed control
- Separately excited DC motor by single and three phase controlled rectifiers
- Methods of speed regulation , field failure protection, armature current limiter (block diagrams)
- Dual rectifier for reversal of rotation
- Speed control by chopper (block diagram)
- Circuit diagram of speed control of single phase and three phase induction motor by cycloconverter (Slip ring).

Chapter – 7 Microprocessor and Computers

- Concept of microprocessor
- Structure , block diagram, function of various units (8085)
- Concept of microcomputer, Input and output devices , classification and computer applications
- Introduction to CNC Machine and PLC (Programmable logic controller)
- Introduction to advance microprocessor and micro controller

10 SUGGESTED LEARNING RESOURCES

a) Textbooks mentioned in the references.

b) Catalogue, manuals etc.

11 SUGGESTED REFERENCES

S.No.	Title	Ed./ Year	Author/ Publisher
1	Industrial Electronics and Instrumentation	Latest Edition	B.K.M. John (Khanna Pub)
2	Industrial Electronics	„	Chute & Chute (McGraw Hills Pub)
3	Industrial Electronics	„	Benedict & weier (Prentice Hall of India Pub)
4	Introduction to thrusters and their applications	„	Ramamurti (east west press Pub)
5	Industrial Electronics	„	Bhimra
6	Digital Computer Electronics	„	Malvino (Tata McGraw Hills Pub)

BRANCH DISCIPLINE: ELECTRICAL & ELECTRONICS ENGINEERING (Dip)

SUBJECT TITLE – POWER ELECTRONICS LAB

Practical Code: 225524 (24)

Periods: 32

LIST OF PRACTICAL EXPERIMENTS:

1. Study of poly phase rectifiers; 3 phase, 6 phase , 3 phase bridge, tracing of wave forms, measurement of peak, r.m.s. average values and ripple frequency and ripple r.m.s. values, using CRO
2. Study of series regulated D.C. power supply find its load regulation.
3. Speed control of single phase induction motor wing triac.
4. Speed control of DC shunt motor using controlled rectifier.
5. Study of AC stabilizer / servo stabilizer.
6. Study of microprocessor and micro controller.
7. Implementation of microprocessor and I/Os on bread board.

CHHATTISGARH SWAMI VIVEKANAND TECHNICAL UNIVERSITY, BHILAI

- 1 SEMESTER** : V
2 SUBJECT TITLE : ELECTRICAL MACHINES -II
3 CODE : 224515 (24)
4 BRANCH DISCIPLINE: ELECTRICALN & ELECTRONICS ENGINEERING (Dip)
5 TEACHING AND EXAMINATION SCHEME

Course code	Teaching scheme (Hrs./week)				Scheme of Examination						Credit L+(T+P)/2
	L	T	P	Total Hours	Theory			Practical		Total Marks	
					ESE	CT	TA	ESE	TA		
224515 (24)	4	1	-	5-	100	20	10	-	-	130	5
225525 (24)	-	-	3	3	-	-	-	40	20	60	2

6 DISTRIBUTION OF MARKS AND PERIODS:

SL NO.	Chapter No.	Chapter Name	Periods	Marks
1	1	Introduction of A.C. Machines	10	5
2	2	Basic features of A.C. Machines	15	10
3	3	Alternators	20	30
4	4	A.C. Motors	20	35
5	5	FHP Motors	15	20
		TOTAL	80	100

7. RATIONALE

This course is classified under basic technology group and is intended to enable the student understand the facts, concepts, principles and procedure of operation & control of electric machines and applications of electrical energy in manufacturing industry, which will enable him/her to work effectively as a supervisor in any organization. AC machines are widely used in various applications like blowers, water pumping stations, etc. This course will help the student to function confidently in his/her career.

8. DETAILED COURSE CONTENTS

Chapter – 1

Introduction to A.C. Machines

- Overview of AC machines
- Difference between A.C. & D.C. Machines

Chapter – 2

Basic Features of A.C. Machines

- Parts of A.C. Machine & their functions
- Materials used for the various parts
- Stator & rotor windings

Chapter – 3

Alternators

- Types of alternators
- Principle & emf equation
- Winding factors & its effect on induced emf
- Effect of frequency on induced emf
- Effect of speed & excitation on induced emf
- Different excitation systems
- Excitation system used in modern alternators
- Concept of leakage, armature & synchronous reactance
- Principle of working of brushless alternators
- Applications.

Chapter – 4

A.C. Motors

- Types of A.C. motors
- Stator & rotor parts, functions, windings
- Concept of rotating magnetic fields
- Stator & rotor current equations
- Effect of frequency on slip
- Torque equations
- Condition for maximum torque
- Torque speed curves
- Circle diagram
- Necessity of induction motor starters and different types
- Methods of speed control of induction motors
- Different types of induction motors

Chapter – 5

FHP Motors

- Construction of Fractional Horse Power (FHP) motors
- Starting methods of Fhp Motors
- Principle of working of FHP motors
- Application of Fhp Motors

9. SUGGESTED IMPLEMENTATION STRATEGIES

The implementation strategy to teach this course should be a good mix of the various teaching methods like lecture, question-answer, assignment and lab work. More drill and practice of numerical will be useful. Home and classroom assignments would prove more useful to develop the analytical skills.

10. SUGGESTED LEARNING RESOURCES

- a) Textbooks mentioned in the references.
- b) Laboratory manuals
- c) Work sheet, workbook etc.

11. SUGGESTED REFERENCES

S.No.	Title	Ed. /Year	Author & Publisher
1.	Electrical Machines	1997	Bhattacharya, S.K., Tata McGraw-Hill, New Delhi
2.	Electrical Machines	1996	Bimbhra, P.S.; Khanna Publishers, New Delhi
3.	Elementary Electrical Engineering	18 th , 1992	Gupta, M.L., New Heights, New Delhi
4.	Basic Electrical Engineering	1990	Mittle, V.N., Tata McGraw-Hill, New Delhi
5.	Electrical Machines	1995	Nagrath & Kothari, Tata McGraw-Hill, New Delhi

BRANCH DISCIPLINE: ELECTRICAL & ELECTRONICS ENGINEERING (Dip)

SUBJECT TITLE – ELECTRICAL MACHINES –II LAB

Practical Code: 225525 (24)

Periods: 48

LABORATORY EXPERIENCES

- a) Performance of three-phase alternator.
- b) Effect of speed & field current on induced emf.
- c) Effect of unbalanced loading.
- d) Measurement of slip by different methods
- e) Performance of three phase induction motor (no load test and load test)
- f) Control of three phase induction motor (speed & direction of rotation)
- g) Determine Torque speed curves of three phase induction motor
- h) Performance of single phase induction motor (no load test and load test)
- i) Control of single phase induction motor (speed & direction of rotation)
- j) Performance of FHP motors (no load test and load test)
- k) Control of FHP motors (speed & direction of rotation)

CHHATTISGARH SWAMI VIVEKANAND TECHNICAL UNIVERSITY, BHILAI

SEMESTER : **V**
SUBJECT TITLE : **Industrial Training**
CODE : **225526 (25)**
BRANCH DISCIPLINE : **ELECTRICAL & ELECTRONICS ENGINEERING**

RATIONALE:

The purpose of industrial training is to offer wide range of practical exposures to latest practices, equipments and techniques used in the field. This training programme will help the student in acquiring hands on experiences of various practices and events required to perform in different job situations. Through the industrial training the students are given an opportunity to develop skills and problem solving ability. The students will have to go for industrial training in the areas related to:

1. Power Plants
2. Electrical Substations
3. Television Studios
4. Radio Transmission Stations
5. Digital Telephone Exchanges, Cell Phone Exchanges
6. Factories where process/manufacturing are electronically/digitally/ computer controlled may be partially or fully.
7. Small service sector industries looking after the maintenance and repairs of computers, digital telephones, televisions, VCRs, DVDs, CD systems, cellular phones etc.

TEACHING AND EXMINATION SCHEME:

Course Code	Periods/Week (In Hours)			Scheme of Examination						Credit L+(T+P)/2
	L	T	P	Theory			Practical		Total Marks	
				E S E	CT	TA	ESE	TA		
225526 (25)	-	-	1	-	-	-	20	10	30	1

L : Lecture hours : T : Tutorial hours, P : Practical hours

ESE – End of Semester Exam.; CT – Class Test; TA- Teacher’s Assessment \

*Industrial Training : one month training will be organized after 4th sem and it’s evaluation will be done in 5th sem.

The duration of industrial training will be of four weeks immediately after end of 4th sem during summer vacation. The Viva-voce will be organized after the end of V semester examination. The industrial Training has basically the following three components: -

1. Orientation Programme
2. Industrial Training in the Industry
3. Report Writing and Evaluation

Note:

During the orientation programme complete guidelines will be provided to the students regarding planning, implementation and evaluation of industrial training.

During the training student will have to maintain a daily dairy to record his observations and experiences at field and on the basis of daily dairy student has to prepare and submit Industrial Training Report.

For evaluation each student has to prepare and present a seminar paper related to experience gained during the industrial training. Each student will be evaluated on the basis of daily diary, training report, seminar presentation and viva voce.
