



SARDAR PATEL UNIVERSITY, BALAGHAT

Academic session 2019-20 & Onwards
Three Year Diploma in Electrical Engineering (EE)

DEE 401

ELECTRICAL MACHINES-II

Unit I.	Three phase Induction Motor - Production of rotating magnetic field, principle, construction and types of induction motors. Equivalent circuit, torque equation, torque-slip characteristics. Types of starters: DOL, Star-delta, Autotransformer type, rotor resistance type, contactor type starter. Speed control. No load and blocked rotor test, losses and efficiency. Braking and applications. Simple numerical.
Unit II	Synchronous motor - Principle, construction, phasor diagram, effect of change in excitation, V curves, synchronous condenser, starting of motors, hunting and its prevention, coding of synchronous machines.
Unit III	Synchronous generator - Principle, construction, salient and cylindrical rotors, speed-frequency relationship, EMF equation, distribution and pitch factor, equivalent circuit, synchronous impedance, regulation, O.C.C. and S.S.C., load characteristics, phasor diagram, parallel operation. Methods of synchronization, power-angle characteristics.
Unit IV	Single phase induction motors - Principle, double revolving field theory. Types of motors with their construction, characteristics and applications. Comparison of three phase with single phase induction motors
Unit V	AC commutator motors - Introduction, series motor, compensated series motor, commutating poles, universal motor, repulsion motor.



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LIST OF EXPERIMENT

S. No.	Experiment Name
1	Study of three phase induction motor (parts).
2	Measurement of slip of three phase induction motor.
3	Study of three phase induction motor starters.
4	Study of synchronous machine (parts).
5	OCC and SCC of synchronous generator and determination of regulation.
6	To plot V curves of synchronous motor.
7	Study of different single phase induction motors (construction).
8	Study of AC commutator motors (construction).

Reference Books

Name of Book	Author	Publisher
Electrical Technology Vol. II	BL Thereja	Khanna publisher
Electrical Machines	Bhattacharya	T.T.T.I.
Electrical Machines	Nagrath & Kothari	PHI
Electrical Machines Vol. I & II	PS Bhimbra	Khanna publishers
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oS qr e'khusa	,p-,l-jk;	nhid izdk'ku



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DEE 402 Electronic Devices

Unit-1 Semiconductor Material Properties: Elemental & compound semiconductor materials , Bonding forces and Energy bands in intrinsic and extrinsic silicon, Charge carrier in semiconductors , carrier concentration, Junction properties, Equilibrium condition, biased junction, Steady state condition, breakdown mechanism (Rectifying Diodes, Zener Diodes), Metal Semiconductor Junction.

Special diodes: Tunnel diodes, Varactor diodes, Schottky diode, Photo diodes, Photodetector, LED, solar cell.

Unit-2 Diode circuits : Ideal and Practical diode, Clipper, Clamper.

Power Supply: Rectifiers-Half wave, Full wave, Bridge rectifier, filter circuits, Voltage regulation using shunt & series regulator circuits, Voltage regulation using IC.

Unit-3 Fundamentals of BJT: Construction, basic operation, current components and equations, CB, CE and CC configuration, input and output characteristics, Region of operations: active, cut-off and saturation region. BJT as an amplifier, Transistor biasing circuits and analysis: Introduction, Transistor as a switch.

Unit-4 Small Signal analysis: Small signal Amplifier, Amplifier Bandwidth, Hybrid model, analysis of transistor amplifier using h-parameter, Multistage Amplifier: Cascading amplifier, Boot-strapping Technique, Darlington amplifier and cas-code amplifier, Power Amplifiers: Class A, Class B, Class AB, Class C, Class D, Transformer coupled and Push-Pull amplifier.

Unit-5 FET construction- JFET: Construction, n-channel and p-channel, transfer and drain characteristics, parameters, Equivalent model and voltage gain, analysis of FET in CG, CS and CD configuration. Enhancement and Depletion MOSFET drain and transfer Characteristics. Uni- junction Transistor (UJT) and Thyristors: UJT: Principle of operation, characteristics, UJT relaxation oscillator.

Text/ReferenceBooks:

1. Millman&Halkias, "ElectronicDevicesAndCircuits", TMH.
2. Salivahanan, Kumar&Vallavaraj, "ElectronicDevicesAndCircuits", TMH.
3. Boylestad&Neshelsky, "ElectronicDevices&Circuits", PHI.
4. Schilling&Belove, "ElectronicCircuits, Discrete&Integrated", TMH.
5. Chattopadhyay&Rakhshit, "ElectronicFundamentals&Applications", NewAge
6. AdelS.Sedra&KennethC.Smith, "MicroelectronicCircuits", OUP.
7. R.A.Gayakwad, "Op-AmpsAndLinearIntegratedCircuits", PHI
8. TheodoreF.Bogart, JeffreyS.Beasley, "GuillermoRicoElectronicDevices&Circuits".
9. AllenMottershead, "ElectronicDevices&Circuits".



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ELECTRONIC DEVICES LAB

1	CRO-Applications
2	V-I Characteristics of Silicon & Germanium PN Junction diodes
3	V-I Characteristics of Zener Diode
4	Characteristics of BJT in Common Emitter Configuration
5	Characteristics of JFET in Common Source Configuration
6	Half Wave and Full Wave Rectifier Without Filter
7	Half Wave and Full Wave Rectifier with Filter
8	Common Emitter BJT Amplifier
9	Hartley & Colpitts Oscillator
10	Applications of Operational Amplifier



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DEE 403

ELECTRICAL ENGG. DRAWING

Unit I	Symbols and Notations - Symbols of practical units, multiples and submultiples, types of supplies, single phase, three phase three wire, three phase four wire, D.C. supply etc. Accessories like main switches, distribution boards, fans, light fixtures, bell, buzzer, lighting arrestor. All types of motor starters, instruments, electronic components etc. Rating plate of machines.
Unit II	Domestic Wiring - All types of light circuits: Fluorescent tube circuits, intermediate switch circuits, fan circuits. Wiring of a residential building. Sodium vapor lamp, mercury vapor lamp.
Unit III	Instrument Circuits - Connection of meters in circuits. Ammeter, voltmeter, wattmeter, energy meter, Power factor meter, frequency meter, synchroscope etc. Extension of range using shunt, multiplier, current transformer, potential transformers etc.
Unit IV	Winding Diagrams - Simplex type lap and wave diagrams for D. C. Machines. Single phase and three phase motor winding diagrams.
Unit V	Electrical Machine Drawing - Parts of D.C. machines like, magnetic poles, commutator, armature etc. A.C. machines rotor, slip rings, etc. Various cable sections. Bushing of the transformer. Assembly diagrams of D.C. machine, A.C. machine, and transformer.
Unit VI	Power Wiring - Internal wiring diagrams of single phase motor. wiring diagrams of D.C. and A.C. motor starters like three point shunt motor starter, four point compound motor starter, direct on line (D.O.L.) starter, star- delta starter, contactor type and auto transformer starter. Internal connections of D.C. series, shunt and



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Reference Books

- (1) A text book of Electrical Drawing .by S.L. Uppal (Khanna pub.)
- (2) Electrical Drawing by K.L. Narang.
- (3) Electrical Drawing by C.R. bargan .



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DEE 404 GENERATION, TRANSMISSION & DISTRIBUTION

S.No.	COURSE CONTENT
1.	Non Conventional Sources Of Energy - Concept and need of primary and secondary energy sources, difference between conventional and non-conventional sources of energy, concept of solar , wind, biogas, ocean, tidal, geothermal, fuel cell , MHD and their practical applications.
2.	Conventional Sources Of Energy - Detailed study of generating stations - thermal, hydro, nuclear, schematic diagram, site selection main components and auxiliaries for above power stations. Study of gas turbines plant and diesel power plant. Advantages, disadvantages of thermal hydro, nuclear, gas turbine plant and diesel power plant.
3.	Concept Of Load - Types of load, load curve, load duration curve, connected load, demand factor, average load, maximum demand, load factor, diversity factor, plant utilization factor, capacity factor, reserve capacity. Simple numerical on above terms.
4. 5.	Types of Tariff, flat rate, block rate, two part, maximum demand and power factor tariff. Their merits and demerits. Simple problems on above terms.
6.	Concept of Transmission, single line diagram of complete power system, standard voltages of A.C. Transmission, efficiency (no derivation). H.V.D.C. transmission system, line diagram, advantages and Disadvantages of H.V.D.C. Sag, causes & effects of sag on transmission line, effect of wind, ice and temperature on sag. Types of line supports, type of joints, lumps, earth wires, ground wire and vibration dampers.



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1	Study of solar cooker.
2	Study of solar water heater.
3	Study of solar photo-voltaic cells.
4	Study of wind mill.
5	Study of Bio Gas plant.
6	Study of steam power plant, hydro power plant, nuclear power plant.
7	Study of line supports and insulators.
8	Determination of string efficiency of insulator string.

REFERENCE BOOK

1	Non Conventional energy sources	By G.D. Rai, Khanna publisher
2	Electrical Power	By S.L.Uppal, Khanna publisher
3	Electrical Power	By J.B. Gupta
4	Power System	By V.K. Mehta
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DEE405 ENTREPRENEURSHIP

Unit I

INTRODUCTION TO ENTERPRENEURSHIP

- Definition of Entrepreneur / Entrepreneur
- Difference between Entrepreneurship / Entrepreneurship
- Need for Entrepreneurship
- qualities of successful entrepreneur
- Myths about Entrepreneurship
- Classification of entrepreneurs on the basis of different criteria
- Reasons for the failure of entrepreneurs

Unit II

INDUSTRIES AND BUSINESS ORGANIZATIONS

- Concept of Industry or Enterprise
- Classification of Industries
- (a) On the basis of capital investment
 - Tiny (Micro) Industry
 - Small Scale
 - Medium Scale
 - Large Scale
- (b) Others
 - Rural Industry
 - Cottage Industry
- (c) Forms of Business Organization
 - Proprietorship
 - Board & Co-operative
 - Partnership
 - Public Ltd.
 - Private Ltd.
 - IT Sector
 - Government Co-operative / Undertakings
- (d) Tiny small scale Industry
 - DefinitionIts significance in National Development.
Govt. policies for SSI promotions
Sector / Product for SSI.

Unit III

INSTITUTIONAL ASSISTANCE

- (a) Types of Institutional assistance
 - Infra - structural assistance
 - Technical Assistance
 - Financial assistance



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- Marketing Assistance
- (b) Information / guidance & Training
 - SISI
 - MPCON
 - CED- MA
 - ASK
 - CSIR
 - NRDC
- (c) Infrastructure
 - D/C
 - AVN/AKVN
- (e) Finance
 - SIDBI
 - NABARD
 - KVIB
 - MPWDC
 - MPFC
 - NSIC
 - M.P.A.V.V.N.
- (d) Marketing
 - MP- AGRO
 - NSIC
 - PM.LUN
 - EXPORT COPPORATION
 - KVIP
 - MPHSVN
 - MPLDC
- (e) Quality Control
 - BIS - FPO
 - MPLUN
 - F.D.A.
 - AG. MKT. Board

Unit IV

INCENTIVES / CONCESSION / FACITLITIES AVAILABLE

- Seed money
- Incentive / subsidies
- Others (Phones, Lands etc)

PLANNING OF AN INDUSTRIAL UNIT (SSI)

- Pre- Planning Stage
 - Scanning the environment
 - Market survey
 - Seeking information
 - product / project selection
- Implementation Stage
 - PPR Preparation
 - DIC registration
 - Arrangement of Land
 - Arrangement of Power
 - Obtaining NOC / Licenses from various departments
 - DPR Preparation
 - Seeking financial assistance
 - Commercial Production
- Post Implementation stage
 - Permanent registration from D.I.C.
 - Availing Subsidies
 - Diversification / Modification
 - Setting up of marketing channel / Distribution.



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Unit V

ACHIVEMENT MOTIVATION

- Historical perspective
- Concept of achievement motivation
- Significance of achievement motivation
- Development of achievement motivation

FINANCIAL MANAGEMENT OF AN INDUSTRIAL UNIT (SSI)

- Tools of financial analysis
- Ratio analysis
- Fund Flow / Cash flow analysis
- Working capital and concepts
- Financial accounting

PROJECT WORK/ASSIGNMENT

1. To prepare chart to showing various factors affecting entrepreneurship.
2. To collect details related to various schemes run by the Govt. for Self-Employment and Entrepreneurship.
3. To identify and select a project and conduct Market-Survey thereof.
4. To collect various formats used in industries & departments/institutions working in the field of entrepreneurship.
5. Visit few small scale industries situated in city, nearby industrial area.
6. Discuss the problems related to SSI (Small Scale Industries) with an entrepreneur.
7. Collect information about market rates quality and quantity of goods for their choice.
8. Develop logical and analytical approach to purchase the raw material / finished goods
9. To prepare case study of successful entrepreneurs.
10. Preparation of Project report for the industry/ Business they are willing to start.

Refrence Books:-

1. Entrepreneurial Development Vol. I,II,III By Vasant desai Himalaya Publicaton
2. CEDMAP (Center of Entrepreneurial development Madhya Pradesh)
3. Udyamita Vikas By Anand Prakashan



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DEE405 MARKETING & MANAGEMENT

Unit I	Evolution of marketing-a historical background
1.1.1	The stage of barter
1.1.2	The stage of money economy
1.1.3	The stage of industrial revolution
1.1.4	The stage of competition
1.1.5	The emergence of marketing
1.2	Selected definitions of marketing
1.3	Different concept of marketing
1.3.1	The exchange concept
1.3.2	The production concept
1.3.3	The product concept
1.3.4	The sales concept
1.3.5	The marketing concept
1.4	Difference between selling & marketing
1.5	Benefits & significance of marketing
1.5.1	Helps to remove causes for under development
1.5.2	Improve productivity & efficiency
1.5.3	Canalize country's economic resources properly
1.5.4	Insure better deal for consumer
1.5.5	Make economic planning meaningful & relevant etc.



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Unit II	Marketing environment
2.1	Internal & external factors
2.1.1	Demographic environment
2.1.2	Economic environment
2.1.3	Political environment
2.1.4	Physical environment
2.1.5	Technological environment
2.1.6	Competitive environment
2.1.7	Social & cultural environment
2.2	Micro & macro environment
Unit III	Marketing planning & organization
3.1	Scope & importance of planning
3.2	Steps in marketing planning process
3.3	Purpose & principle of organization
3.4	Models of marketing organization
3.4.1	Line & staff type
3.4.2	Product based organization
3.4.3	Territory oriented organization
3.4.4	Complex organization
3.5	Task of chief marketing executive
3.6	Decentralization
Unit IV	Market segmentation
4.1	Types of market
4.2	Definitions & benefits of segmentation
4.3	Methods of segmentation
4.3.1	Geographic segmentation
4.3.2	Demographic segmentation
4.3.3	Psychographic segmentation
4.3.4	Buyer behavior Segmentation
4.3.5	Volume segmentation
4.4	Steps in market segmentation
4.5	Market targeting



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Unit V	Market mix
5.1	Definition of market mix
5.2	Elements of marketing mix (4 P'S)-Product,Place,Price,Promotion
5.3	Environmental variable (uncontrollable variables)
5.3.1	Customer variable
5.3.2	Competition variable
5.3.3	Trade variable
5.3.4	Environmental variable
5.4	Product management
5.4.1	Components of product <ul style="list-style-type: none">• The core or basic constituent• The associated features• The brand names, package,label
5.4.2	Types of product <ul style="list-style-type: none">• The generic product• The branded product• The differentiated product• The customized product• The augmented & potential product
5.4.3	The product line & product mix
5.5	New product development (NPD)
5.5.1	Significance & classification of new product
5.5.2	Stages in NPD
5.5.3	Estimating the demand for new product
5.5.4	Test marketing
5.6	Product life cycle (PLC)
5.6.1	Concepts & benefits of PLC
5.6.2	Different stages in PLC
5.6.3	Strategies used in different stages
5.7	Place management
5.7.1	Physical distribution <ul style="list-style-type: none">• Definitions & importance of physical distribution• Designing the physical distribution system
5.7.2	The distribution channel <ul style="list-style-type: none">• The role & importance of distribution channel• Planning & designing of distribution channel• Types of distribution intermediaries
5.8	Price management



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5.8.1	The meaning & importance of pricing
5.8.2	Objectives of pricing
5.8.3	Factors affecting pricing –Internal & external
5.8.4	Pricing methods <ul style="list-style-type: none">• Cost based pricing• Break even pricing• Demand based pricing• Competition based pricing• Product line pricing• Tender pricing
	<ul style="list-style-type: none">• Affordability pricing• Differentiated pricing
5.8.5	Pricing policies & setting the price
5.9	Promotion management
5.9.1	Sales promotion <ul style="list-style-type: none">• Importance & objectives of sales promotion• Tools & techniques of sales promotion
5.9.2	Advertising <ul style="list-style-type: none">• Role & importance of advertising• Types of advertising• Deciding on the advertising budget• Evaluating advertising effectiveness
5.9.3	Difference between sales promotion & advertising

Reference Books:-

1. Marketing management - Analysis, Planning & Control - Philip Kotler
2. Principles & practice of Marketing in India - C.B.Memoria & R.L.Joshi
3. Contemporary Marketing – Louis & Bone & David L. Kurtz
4. Essential of Management –Koontz
5. Marketing management- S.A. Sherlekar



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DEE406P Professional Activities

OBJECTIVES:

1. To allow for professional development of students as per the demand of engineering profession.
2. To provide time for organization of student chapter activities of professional bodies) i.e. Institute of engineers, ISTE or Computer Society of India etc.)
3. TO allow for development of abilities in students for leadership and public speaking through organization of student's seminar etc.
4. To provide time for organization of guest lectures by expert engineers/ eminent professionals of industry.
5. To provide time for organization of technical quiz or group discussion or any other group activity.
6. To provide time for visiting library or using Internet.
7. To provide time for group discussion or solving case studies.
8. To provide time for personality development of students.
9. To provide time for working for social cause like awareness for environmental and ecology etc.

DETAILED INSTRUCTIONS TO CONDUCT PROFESSIONAL ACTIVITIES

- A. Study hours, if possible should be given greater time slot with a minimum of two hrs/week to a maximum of four hrs/week.
- B. This course should be evaluated on the basis of grades and mark sheet of students, should have a separate mention of the grade awarded. There will be no pass/fail in professional activities (PA).
- C. Following grade scale of evaluation of performance in PA has been established.

<u>Grades</u>	<u>Level of performance</u>
	Excellent
	Good
	Fair
	Average
	Below Expectations

7. Grades once obtained in a particular examination shall become final and no chance of improvement in grades will be given to the students.
8. Assessment of performance in PA is to be done internally by the Institution, twice in a Semester/Term through a simultaneous evaluation of the candidate by a group of three teachers, of the deptt. Concerned. Group of teachers will jointly award the grade to candidate in the assessment. Best of the grades obtained by the student in these two assessments shall be finally taken on the mark sheet of the respective Semester/Term.



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Candidate abstaining from the prescribed course work and/or assessment planned at the Institute shall be marked ABSENT in the mark sheet, instead of any grade.

9. While awarding the grades for performance in PA, examining teacher should reach the final consensus based on the attendance, punctuality, interest, presentation skills in seminar on the topic assigned (collection of relevant data, observations, analysis, findings/conclusion) and its written report, awareness of latest developments in the chosen programme of study.

- G. Institution shall maintain the record of grades awarded to all the students in PA for a period of 1 year.
2. It shall be mandatory for students to submit a compendium for his PA in the form of a Journal.
3. Compendium shall contain following:
 - (e) Abstract of the guest lectures arranged in the Institution.
 - IV. Topic and outcome of the group discussion held.
 - V. Report on the problems solved through case studies.
 - VI. Report on social awareness camps(organized for social and environmental prevention).
 - VII. Report on student chapter activities of professional bodies like ISTE, IE (India), CSI etc.
3. PA is not a descriptive course to be taught in the classroom by a particular teacher. Various activities involved in the achievement of objectives of this course should be distributed to a number of teachers so that the talent and creativity of group of teacher's benefit the treatment of the course content. These activities should preferably be conducted in English language to maintain continuity and provide reinforcement to skill development. Small groups shall be formed like in tutorials, group discussion, case studies, seminar, project methods, roll play and simulation to make the development of personality affective.

Treatment of PA demands special efforts, attention, close co-operation and creative instinct on the part of teachers of department concerned. Since this course is totally learner centered, many of the activities planned under this course shall come out from the useful interaction of student, among themselves and with the teachers. The guide teacher/s shall best act as a facilitator of these creative hunts/ exercises, which unfold many of the hidden talents of the students or bring out greater amount of confidence in them, to execute certain activity.