

ओउम्



कोल्हान विश्वविद्यालय चाईबासा

विद्युत अभियांत्रिकी विभाग

FOURTH YEAR

EIGHTH SEMESTER											
SL. NO.	COURSE NO.	SUBJECT	PERIODS			EVALUTION SCHEME				CREDITS	
THEORY			L	T	P	SESSIONAL EXAM			ESE	SUB TOTAL	
						TA	CT	TOT			
1	EE1801	High Voltage Engineering	3	1	0	30	20	50	100	150	4
2	EE1802	Digital Signal Processing	3	1	0	30	20	50	100	150	4
3	HS2821	Open Elective II	3	1	0	30	20	50	100	150	4
4	EE2823	Professional Elective I	3	1	0	30	20	50	100	150	4
5	EE2723	Professional Elective II	3	1	0	30	20	50	100	150	4
PRACTICAL/DRAWING/DESIGN											
1	EE1803-P	Project II	0	0	12	100	0	100	100	200	6
2	HS1808-P	General Proficiency 8	0	0	0	0	0	50	0	50	2
TOTAL			15	5	12	0	0	0	0	1000	28

TA-TEACHER ASSESSMENT

CT-CLASS TEST

ESE-END SEMESTER EXAMINATION

TOTAL MARKS- 1000

TOTAL PERIOD-32

TOTAL CREDITS-28

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8TH SEMESTER ELECTIVE			
ELECTIVE	SERIAL NO	CODE	PAPER
OPEN ELECTIVE II	6	CS2821	IT in Marketing Management
	7	CS2822	IT in HR Management
	8	CS2823	IT in Finance Management
	9	CS2824	Project Management & Software Tools
	10	HS2821	Human Values
PROFESSIONAL ELECTIVE II	7	EC2821	Data Communication & Design
	8	EC2823	Advanced Topic in Microprocessors & Microcontroller
	9	CS2825	Personal Computer System
	10	EC2824	Biomedical Instrumentation
	11	EE2821	Power Electronics
	12	EE2823	Utilization of Electrical Power
PROFESSIONAL ELECTIVE III	13	CS2826	System Software
	14	CS2827	Computer Graphic
	15	EC2825	Modeling & Simulation
	16	EC2826	Television Engineering
	17	EC2827	VLSI Design
	18	EE2822	Neural Network& Fuzzy System
	19	CS2828	Computer Networks
	20	EE2723	High Voltage DC Transmission

SEMESTER VIII

EE1801

HIGH VOLTAGE ENGINEERING

(3-1-0)

I. BREAKDOWN IN GASES:-

Mechanism of breakdown in gases, various related ionization processes, Townsend's and Steamer theories, Paschen's law, Breakdown in Non-uniform fields; Effect of wave shape of impressed voltage on the breakdown strength, Breakdown of sphere gap and rod gap.

II. BREAKDOWN IN LIQUIDS AND SOLIDS:-

Mechanisms of breakdown in liquids, suspended particle, suspended water, cavitations and bubble and electronic breakdown theories; Mechanisms of breakdown in solids; Intrinsic electro-mechanical, erosion, surface, thermal and steamer; Relation between electric strength of solids and time, intrinsic breakdown strength.

III. IMPULSE GENERATOR:-

Specification of an impulse voltage wave, standard impulse, reasons for adopting the particular shape, Analysis and control of simple circuit of impulse generator; Multi-stag impulse generator (Marks circuit) circuit working, earthing and tripping; Techniques to observe wave front on C.R.O .

IV. GENERATION OF HIGH VOLTAGE:-

Methods of generation of power frequency, high voltage cascade transformers and resonance methods, Generation of high voltage DC, Voltage stabilization, Tesla coil.

V. MEASUREMENT OF HIGH VOLTAGE:-

Potential dividers – resistive, capacitive and mixed dividers for high voltage, sphere gap, construction, mounting, effect of nearby earthed objects, humidity and atmosphere conditions, effect of irradiation and polarity; Electrostatic voltmeter – principles and classification, constructional details of an absolute electrostatic voltmeter; Oscilloscopes and their applications in high voltage measurement.

VI. HIGH VOLTAGE TESTING:-

Measurement of insulation resistance of cables; Wet and dry flashover test of insulators, Testing of insulators in simulated polluted conditions; Testing of transformers and rotating machines; Measurement of breakdown strength of oil; Basic techniques of non-destructive testing insulators; Measurement of loss angle, High voltage Schering bridge and partial discharge measurement techniques.

VII. OVER VOLTAGE AND INSULATION COORDINATION:-

Lighting Switching and temporary over voltages, BIL, SIL, methods of insulation coordination.

SUGGESTED BOOKS & REFERENCES:-

- Bewley, L.V.,” Travelling Waves on Transmission Systems.” Wiley New York, 2nd Edition, 1963.
- Nidu, M.S. and Kamaraju, V.” High Voltage Engineering”, Tata McGraw Hill,1982.
- Wadhawa, C.L., “ High Voltage Engineering” Wiley Eastern 1994.

EE1802

DIGITAL SIGNAL PROCESSING

(3-1-0)

Sampling and Data Reconstruction Process, Z- transform.

Discrete linear systems, Frequency domain of digital filters.

Quantization efforts in digital filters.

Discrete Fourier transform and FFT algorithms.

High speed convolution and its applications to digital filtering; Multi- rate filtering.

SUGGESTED BOOKS & REFERENCES:-

- Rabiner, I.,R.& Gold, B.,”Theory and application of Digital Signal Processing” Prentice Hall, 1989.
- Openheim 7 Schafer, “Digital Signal Processing”, Prentice Hall, 1995.

HS2821

HUMAN VALUES

(3-1-0)

The objectives of the course is an exploration of human values which go into making a 'good' human being, a 'good' human society and a 'good' life. The context is the work life the personal life of modern Indian professionals. The course has been taught for two years as an elective course to B. Tech Part III students of IT-BHU.

1. The value-crisis in the contemporary Indian Society.
2. The nature of values: The value spectrum for a 'good' life.
3. The Indian system of values.
4. Material development and its values: The challenge of science and technology.
5. Psychological Values: Integrated personality, mental health.
6. Societal Values: The modern search for a 'good' society; justice, democracy, rule of law; values in the Indian constitution.
7. Aesthetic Values: perception and enjoyment of beauty.
8. Moral and Ethical Values: Nature of moral judgments; canons of ethics, ethics of virtue, ethics of duty, ethics of responsibility.
9. Work ethics, professional ethics.
10. Spiritual Values: different concepts; secular spirituality.
11. Relative and absolute values.
12. Human Values: humanism and human values; human rights; human values as freedom, creativity, love and wisdom.
13. Management by Values: professional excellence; inter-personal relationships at work place, leadership and team building, caring sharing, conflict resolution and stress management, management of power.

TEXT BOOKS/REFERENCE BOOKS :-

1. Code of practice for corporate member; Institute of Engineers 1994.
2. Human Values – Professional Ethics, Ritu Soryan- Dhanpat Rai & Co.

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I.ELECTRICAL DRIVES:-

Review of motor performance characteristics,mechanical features,different types of industrial loads, standard rating,selection of motors,rating for different duty cycles,efficient operation of motors.

II.ELECTRIC HEATING:-

Electric Heating and its application ,various laws governing electric heating.Electric welding:different types,equipment used.

III.ILLUMINATION:-

Photometric terms and laws,types of lamps,principle of lighting calculations.Design of residential/public buildings,road lightining.

IV.ELECTRIC TRACTION:-

Electric and diesel traction systems ,speed-time curves,traction motors,speed control and methods of brakings.

V.ECONOMIC ASPECTS:-

Economic choice of equipment,initial cost and efficiency,reduction of energy costs,cost renewals,effects of power factor,costing of electrical energy.

VI.ELECTRICITY TARIFF.

I.HVDC TRANSMISSION:-

Introduction, Equipment required for HVDC Systems, Comparison of AC and DC Transmission, Limitations of HVDC Transmission Lines, Reliability of HVDC Systems, Comparison of HVDC Link with EHVAC Link, HVDC-VSC Transmission Systems.

II.HVDC CONVERTERS:-

Introduction, HVDC Converter Valves and Valve Assembly, HVDC-Voltage Source Converters: Principle and Operation, 3-phase 6-pulse Converters using SCRs or Thyristors, 12-pulse Bridge Converters.

III.6-PULSE CONVERTER OPERATION AND ANALYSIS:-

Introduction, Conduction Sequence in 6-pulse Converter Configuration, The Ideal Commutation Process without Gate Control, DC Output Voltage, Gate Control (Phase Control) of Valves, Analysis of Voltage Waveforms with Overlap Angle (μ), Complete Characteristics of Converter as Rectifier/Inverter, Analysis of 12-pulse Converter, Power Flow in HVDC Links, Operation and Analysis of VSC Converters.

IV.CONTROL OF HVDC CONVERTER AND SYSTEMS:-

Mechanism of AC Power Transmission, Principle of Control, Necessity of Control in case of a DC link, Rectifier Control, Compounding of Rectifiers, Power Reversal in a DC Link, Voltage Dependent Current Order Limit (VDCOL)-Characteristics of the Converter, System Control Hierarchy and Basic Philosophy, Inverter Extinction Angle Control (EAG), Pulse Phase Control, Starting and Stopping of a DC Link, Constant Power Control, Control Systems for HVDC Converters, Inverter Operation Problems, Control of VSC Converters.

V.HARMONICS IN HVDC SYSTEMS:-

Importance of Harmonic Study, Generation of Harmonics by Converters, Characteristic Harmonics on the DC Side, Characteristic Current Harmonics, Characteristic variations of Harmonic Currents with Variation of α & μ , Effect of Control modes on Harmonics, Non-Characteristic Harmonics, Harmonics in VSC Converters.

VI.HARMONIC SUPPRESSION IN HVDC SYSTEM-FILTERS:-

Harmonic Model & Equivalent Circuit, Use of Filters, Filter Configurations, Design of a Band-Pass Filter, Design of High-Pass Filters, Protection of Filters, DC Filters.

VII.FAULTS AND PROTECTION SCHEMES IN HVDC SYSTEMS:-

Nature and Types of Faults, Faults on AC Side of Converter Stations, Converter Faults, Faults on DC Side of the System, Protection against Over Currents/ Over Voltages, Protection of Filter Units.

VIII.MULTI-TERMINAL HVDC SYSTEMS :-

Types of Multi-terminal (MTDC) Systems, Parallel Operation Aspects of MTDC, Paralleling (Disconnecting) of Units or Converter, Control of Power in MTDC, VSC-Multi-level DC Systems.

TEXT BOOKS/ REFERENCE BOOK:-

- 1.“HVDC Transmission” By S. Kamakshaiah & V. Kamaraju, TMH Education Private Ltd., New Delhi.
- 2.“HVDC Power Transmissions Systems: Technology & Systems Interaction”, K.R. Padiyar, New Age Publication.

PRACTICAL/DRAWING/DESIGN

HS1803–P

GENERAL PROFICIENCY VIII

(0-0-0)

Debate, Elocution, Extempore, Group Discussion, panel Discussion, Presentation Paper & Oral, Allegation & clarification, Quiz / Brain Teaser, Survey, Report / Project Report / Case Study, Dissertation, Mock Interview, Expository / Argumentative Report & National Service Scheme (NSS).

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