

M.D. UNIVERSITY, ROHTAK
Scheme of studies & Examination
Bachelor of Engineering (Electrical Engg.)

SEMESTER VII

Modified 'E' Scheme effective from 2006-07

Course No.	Course Title	Teaching Schedule				Marks of Class Work	Examination		Total Marks	Duration of Exam
		L	T	P	Total		Theory	Practical		
EE-401-E	DATA COMMUNICATION (EL,EE)	3	1	-	4	50	100	-	150	3
EE-403-E	ELECTRIC DRIVES	3	1	-	4	50	100	-	150	3
EE-407-E	DIGITAL SIGNAL PROCESSING (EL, EI, IC, EE)	3	1	-	4	50	100	-	150	3
EE-411-E	POWER SYSTEM OPERATION AND CONTROL	3	1	-	4	50	100	-	150	3
	*OPEN ELECTIVE	4	-	-	4	50	100	-	150	3
EE-413-E	ELECTRIC DRIVES LAB.			2	2	25	-	25	50	3
EE-421-E	DATA COMMUNICATION LAB (EL, EE)	-	-	2	2	25	-	25	50	3
EE-427-E	DIGITAL SIGNAL PROCESSING LAB (EL, EI, IC, EE)	-	-	2	2	25	-	25	50	3
EE-415-E	PROJECT	-	-	4	4	50	-	-	50	3
EE-417-E	PRACTICAL TRAINING – II	-	-	2	2	-	-	-		-
	TOTAL	16	4	12	32	375	500	75	950	

List of Open Electives

1	HUM-451-E	Language Skills for Engineers	8	CSE-451-E	Artificial Intelligence & Expert Systems
2	HUM-453-E	Human Resource Management	9	CSE-303-E	Computer Graphics
3	HUM-457-E	Business Communication	10	IC-455-E	Intelligent Instrumentation for Engineers
4	HUM-455-E	Entrepreneurship	11	IC-403-E	Embedded Systems
5	PHY-451-E	Nano technology	12	CH-453-E	Pollution & Control
6	PHY-453-E	Laser Technology	13	IT-471-E	Management Information System
7	ME-451-E	Mechatronics Systems	14	IT-204-E	Multimedia Technologies

Note:

- Students will be allowed to use non-programmable scientific calculator. However, sharing of calculator will not be permitted in the examination.
- *Student will be permitted to opt for any one elective run by the other departments. However, the departments will offer only those electives for which they have expertise. The choice of the students for any elective shall not be a binding for the department to offer, if the department does not have expertise.
- Assessment of Practical Training-II, carried out at the end of VI semester, will be based on seminar, viva-voce and project report of the student from the industry. According to performance letter Grades A, B, C, F are to be awarded. A student who is awarded 'F' grade is required to repeat Practical Training.
- Project load will be treated as 2 hours per week for Project Coordinator and 1 hour for each participating teacher. Project will commence in VII semester where the students will identify the Project problem, complete the design/procure the material/start the fabrication/complete the survey etc., depending upon the nature of the problem. Project will continue in VIII semester.

L T P
3 1 0

CLASS WORK	:	50
EXAM	:	100
TOTAL	:	150
DURATION OF EXAM	:	3 HRS

UNIT 1 DIGITAL COMMUNICATION :

Introduction, digital communication, Shannon limit for information capacity, digital radio, digital amplitude modulation, frequency shift keying (FSK), phase shift keying (PSK), quadrature amplitude modulation (QAM), band width efficiency, carrier recovery, differential phase shift keying,(DPSK), clock recovery, probability of error & bit error rate, trellis encoding.

UNIT 2 DATA COMMUNICATIONS:

Introduction, history of data communication, standard organization for data communication, data communication circuits, data communication codes, error control, synchronization, data communications hardware, serial interfaces: RS-232, RS-449 & RS-530, CCITT X.21, parallel interfaces: centronics parallel interfaces. the telephone network: DDD network, private- line service, the telephone circuit, data modems: synchronous modems, asynchronous modems, modem synchronization.

UNIT 3 DATA COMMUNICATIONS PROTOCOLS AND NETWORK CONFIGURATIONS :

Introduction, open system interconnection (OSI), data transmission mode, asynchronous protocols, synchronous protocols, public data network, integrated services digital network (ISDN), local area networks, token pass ring, Ethernet.

UNIT 4 MULTIPLEXING :

Introduction, time division multiplexing, T1 digital carrier system, CCITT time division multiplexed carrier systems, CODECS, COMBO chips, line encoding, T-CARRIERS, frame synchronization, bit interleaving VS word interleaving, frequency division multiplexing, AT&T's FDM hierarchy, composite base band signal, formation of a master group.

UNIT 5 INTERNET AND TCP/IP:

Introduction, history, use of Internet, accessing the Internet, Internet addresses, security on the internet, authentication, firewalls, intranet and extranet, TCP/IP reference model, domain name service, world wide web.

TEXT BOOK:

1. Electronic Communications Systems (4th Ed.) : Wayne Tomasi; Pearson
2. Data Communication and Networking (2nd -edition): Forauzan;

NOTE Eight questions are to be set at-least one from each unit. Students have to attempt any five questions

EE-403-E**ELECTRIC DRIVES**

L T P	Theory	: 100 marks
3 1 -	Class work	: 50
	Total	: 150
	Duration of exam.	: 3 hours

1. ELECTRICAL DRIVES: Introduction, Classification, advantages, Characteristics of Electric Motors, choice of electrical drive machines, status of ac and dc drives.
2. CONTROL OF ELECTRICAL DRIVES: Modes of operation, closed loop control of drives, sensing of current and speed, Microprocessor based control of electric drives
3. DYNAMICS OF ELECTRICAL DRIVES: Fundamental torque equations, multi-quadrant operation, equivalent values of drive parameters, load torque components, types of loads.
4. SELECTION OF MOTOR POWER RATING: Heating and cooling, determination of motor rating, continuous, short time and intermittent duty rating, load equalization and determination of moment of inertia of the flywheel.
5. DC MOTOR DRIVES: Starting, Acceleration control, braking, transient analysis, Converter fed dc drive & chopper fed dc drive.
6. INDUCTION MOTOR DRIVES: Starting, Acceleration control, braking, transient analysis, Static control techniques- stator frequency control, stator voltage control, rotor resistance control. Static Scherbius system & static Kramer system, vector control.
7. PMSM & PMSAC DRIVES: Permanent Magnet Brushless D C drive, Permanent Magnet Sine-fed drives, Switched Reluctance Machine Drives.

TEXT BOOKS:

1. Fundamentals of Electrical Drives:- by G.K.Dubey, Narosa Publishing House, New Delhi, 1995
2. Electric drives: Concepts and applications, V.Subrahmaniyam, TMH, New Delhi.

REFERENCE BOOKS:

1. Power Semiconductor controlled drives; by G.K.Dubey, Prentice Hall.
2. Kusko, A., Solid State DC Motor Drives, MIT Press, Cambridge, Mass.USA,1969
3. Pillai S.K., A First course in electric drives, Wiley Eastern, New Delhi.
4. Chillikan, M., Electric Drives, Mir Publishers, Moscow, 1970.
5. Bose B.K., Power Electronics & AC Drives, Prentice Hall, New Delhi,1991.

NOTE: 8 questions are to be set –atleast one from each unit. Students have to attempt any 5 questions.

EE-411-E

POWER SYSTEM OPERATION AND CONTROL

L T P
3 1 -

Theory :100 marks
Class work :50 marks
Total marks :150 marks
Duration of Exam

: 3 Hours

1. AUTOMATIC GENERATION CONTROL: Load frequency control (single area case), load frequency control and economic dispatch, optimal load frequency control, Load Management.
2. ECONOMIC LOAD DESPATCH: Introduction, Optimal Operation of Generators of Bus bar, Unit Commitment, Reliability Considerations, Optimal Generation Schedule Hydro thermal optimal scheduling.
3. POWER SYSTEM STABILITY: Steady state, transient & dynamic stabilities, equal area criteria, effect of fault clearing time on transient stability, dynamics of synchronous machine, factors affecting transient stability.
4. AUTOMATIC VOLTAGE CONTROL & EXCITATION SYSTEMS: AVRs, role of AVR on transient stability of system, type 0 & 1 excitation system, power system stabilizers.
5. VOLTAGE STABILITY: Basic concept, Voltage collapse, Modelling & prevention.

TEXT BOOKS: 1. Power System Engineering, : I.J. Nagrath & D.P. Kothari :TMH
2 . Power System Stability Volume-I : E.W. Kimbark, John Wiley & Sons.

REF. BOOKS:

1. Voltage stability by Taylor
2. Power System Control and Stability: P.Kundur : Mc Graw Hill
3. Electric Energy System Theory: O.I.Elgerd : TMH
4. Computer Aided Power System Analysis : S.I. Ahson,D.P.Kothari & A.K. Mahalanabis, TMH.
5. Power System Analysis & Design : B.R.Gupta, Wheelers Publication,
6. EHV-AC/DC Transmission System ; S.Rao : Khanna Pub.
7. PGO & C: Wood & Wallenberg, John Wiley & Sons.

NOTE: 8 questions are to be set – atleast one from each unit. Students have to attempt any five questions.

L T P
3 1 0

CLASS WORK	:	50
EXAM	:	100
TOTAL	:	150
DURATION OF EXAM	:	3 HRS

UNIT1. DISCRETE-TIME SIGNALS:

Signal classifications, frequency domain representation, time domain representation, representation of sequences by Fourier transform, properties of Fourier transform, discrete time random signals, energy and power theorems.

UNIT2. DISCRETE-TIME SYSTEMS : Classification, properties, time invariant system, finite impulse Response (FIR) system, infinite impulse response (IIR) system.

UNIT3. SAMPLING OF TIME SIGNALS:

Sampling theorem, application, frequency domain representation of sampling, reconstruction of band limited signal from its samples. discrete time processing of continuous time signals, changing the sampling rate using discrete time processing.

UNIT4. Z-TRANSFORM :

Introduction, properties of the region of convergence, properties of the Z-transform, inversion of the Z-transform, applications of Z-transform.

UNIT5. BASICS OF DIGITAL FILTERS : Fundamentals of digital filtering, various types of digital filters, design techniques of digital filters : window technique for FIR, bi-linear transformation and backward difference methods for IIR filter design, analysis of finite word length effects in DSP, DSP algorithm implementation consideration. Applications of DSP.

UNIT6. MULTIRATE DIGITAL SIGNAL PROCESSING:

Introduction to multirate digital signal processing, sampling rate conversion, filter structures, multistage decimator and interpolators, digital filter banks.

TEXT BOOKS :

1. Digital Signal Processing : Proakis and Manolakis; PHI
2. Digital Signal Processing: Salivahanan, Vallavaraj and Gnanapriya;TMH

REFERENCE BOOKS:

1. Digital Signal Processing: Alon V. Oppenheim;PHI
2. Digital Signal processing(II-Edition): Mitra, TMH

NOTE: Eight questions are to be set - at least one from each unit. Students have to attempt five questions.

EE-421-E**DATA COMMUNICATION LAB**

L T P
0 0 2

CLASS WORK	:	25
EXAM	:	25
TOTAL	:	50
DURATION OF EXAM	:	3 HRS

LIST OF EXPERIMENTS:

- 1) To study different types of transmission media
- 2) To study Quadrature Phase Shift Keying Modulation.
- 3) To study Quadrature Amplitude Modulation.
- 4) To Study !6 Quadrature Amplitude Multiplexing.
- 5) To Study Serial Interface RS-232 and its applications.
- 6) To study the Parallel Interface Centronics and its applications.
- 7) To configure the modem of a computer.
- 8) To make inter-connections in cables for data communication in LAN.
- 9) To install LAN using Tree topology.
- 10) To install LAN using STAR topology.
- 11) To install LAN using Bus topology.
- 12) To install LAN using Token-Ring topology
- 13) To install WIN NT
- 14) To cofigure a HUB/Switch.

NOTE : 1. At least ten experiments have to be performed in the semester; At least seven experiments should be performed from above list. Remaining three experiments may either be performed from the above list or designed & set by the concerned institution as per the scope of the syllabus .

EE-413-E

ELECTRIC DRIVES LAB

L T P
- - 2

Practical : 25 marks
Class work : 25 marks
Total : 50 marks
Duration of exam. : 3 hours

1. Speed control of dc motor using dc chopper.
2. Speed control of dc motor using single- phase converter.
3. Speed control of dc motor using 3- phase converter.
4. Speed control of dc motor using single- phase dual converter.
5. Inverter fed single-phase induction motor drive.
6. CSI fed induction motor drive.
7. Speed control of single- phase induction motor using ac regulator.
8. Regenerative braking of dc motor using single- phase converter.
9. Speed control of single-phase induction motor using cycloconverter.
10. Static rotor resistance control method.

NOTE : 1. At least 10 experiments have to be performed with atleast 7 from above list, remaining 3 may either be performed from above list or designed & set by concerned institution as per scope of syllabus.

L T P
0 0 2

CLASS WORK	:	25
EXAM	:	25
TOTAL	:	50
DURATION OF EXAM	:	3 HRS

LIST OF EXPERIMENTS:

Perform the experiments using MATLAB:

1. To represent basic signals (Unit step, unit impulse, ramp, exponential, sine and cosine).
2. To develop program for discrete convolution.
3. To develop program for discrete correlation.
4. To understand stability test.
5. To understand sampling theorem.
6. To design analog filter(low-pass, high pass, band-pass, band-stop).
7. To design digital IIR filters(low-pass, high pass, band-pass, band-stop).
8. To design FIR filters using windows technique.
9. To design a program to compare direct realization values of IIR digital filter
10. To develop a program for computing parallel realization values of IIR digital filter.
11. To develop a program for computing cascade realization values of IIR digital filter
12. To develop a program for computing inverse Z-transform of a rational transfer function.]

NOTE: At least ten experiments have to be performed in the semester; out of which at least seven experiments should be performed from above list. Remaining three experiments may either be performed from the above list or designed & set by the concerned institution.