

Sl.No	Course No.	Subject	Periods			Evaluation Scheme				Credit	
THEORY			L	T	P	SESSIONAL EXAM				SUB TOTAL	
						TA	CT	TOT	ESE		
1	HS1701	COMPUTER AIDED POWER SYSTEM	3	1	-	15	10	25	50	75	4
2	ME1702	NETWORK SYNTHESYS	3	1	-	15	10	25	50	75	4
3	ME1703	POWER SYSTEM PROTECTION & SWITCHGEAR	3	1	-	30	20	50	100	150	4
4		OPEN ELECTIVE I	3	1	-	30	20	50	100	150	4
5		PROFESSIONAL ELECTIVE I	3	1	-	30	20	50	100	150	4
PRACTICAL/DRAWING/DESIGN											
7	ME1704-P	COLLOQUIUM	-	-	3	30	20	50	100	150	2
8	ME1705-P	COMPUTER AIDED POWER SYSTEM LAB	-	-	3	25	-	25	25	50	2
9	ME1706-P	SWITCHGEAR & PROTECTION SYSTEM	-	-	3	25	-	25	25	50	2
10	ME1707-P	PROJECT I	-	-	3	25	-	25	25	50	2
11	HS1707-P	GENERAL PROFICIENCY VII	-	-	-	-	-	50	-	50	2
		TOTAL	15	5	12	-	-	-	-	1000	30

TA-TEACHERS ASSESSMENT
TOTAL MARKS: 1000

CT-CLASS TEST
TOTAL PERIODS: 34

ESE- END SEMESTER EXAMINATION
TOTAL CREDITS: 32

	Sl.No.	Code	PAPER
OPEN ELECTIVE I	01	HS2721	Enterprise Resource Management
	02	CS2721	E-Commerce Strategic IT
	03	HS2722	Technology Management.
	04	HS2723	Decision Support and Executive Information system.
	05	CS2722	Software Technology
	06	HS2724	Knowledge Management
PROFESSIONAL ELECTIVE II	01	HS2725	Non conventional Energy Source
	02	EE2721	High Voltage Engineering
	03	EE2722	Special Electrical Machines
	04	EE2723	HVDC Transmission
	05	EC2721	Microprocessor based System Design
	06	EC2722	Advance Topic in Microprocessor & Microcontroller
	07	EE2724	Computer Aided Design Of Electrical Machine

Representation of Power System Components

- Modeling, Y-Bus formulation
- GS, NR, FDLF methods

Optimal Power System Operation

- Unit commitment
- Reliability
- Economic Dispatch
- Emission Dispatch
- Optimal Load flow
- Optimal Hydro-thermal scheduling a,

Power System security

State estimation

Load forecasting

Fault analysis — balanced and unbalanced Automatic generation control

Power System Transients

Computer Aided Power System Protection

PRACTICAL:

EE 1705-P COMPUTER AIDED POWER SYSTEM LAB

(0—0—3)

List of Experiments:

- Study of Security of Power System.
- Study of Faults in Power System.
 - Study of methods of Fault Detection in Power System. For unbalanced and unbalanced loadings.
 - Computer Aided Design of Control Automatic Power Generation.
 - Computer Aided Design of Power System Protection.
 - Experiments based on the problems discussed in the class such as Y-Base formulation, optimal load flow analysis, Load forecasting etc.

Suggested Books & References:

- Nagrath, I. J. and Kothari, D. P. *"Power System Engineering"*, Tata McGraw Hill, New delhi, 1994.
- Mahalanabis, A. K., Kothari, D. P. and Ahson *"Computer Aided Power System Analysis and Control"*, TMH, New Delhi, 1998.

Introduction to synthesis Problems

Formulation of State Synthesis Problems

Basic Impedance Synthesis Problems, LC and RC impedances Reciprocal and Synthesis

Transfer Function of ladder networks

Properties of second-order systems

Second-order Low Pass Networks

Second-order Band Pass Networks

Second-order High Pass Networks

Approximations, LP, HP, BP

Band-stop functions and realizations

Reciprocal transfer functions synthesis

Non-reciprocal transfer function s synthesis

T. F. Synthesis with prescribed loading

Scattering matrix synthesis

Suggested Books & References:

- Enderson et al, B. D. O., "*Network Analysis and Synthesis: A Modern Systems Theory Approach*", Prentice Hall, Inc. Englewood Cliffs, New Jersey, 1973..
- Budak Aram, "*Passive and Active Network Analysis and synthesis*", Houghtnn Mifflin Co., Boston, 1974.

Protection

Importance of Protective relaying in Power Systems, Fundamental requirements of a good protection Scheme; Primary and Back-up Relaying;

Classification of Relays

Constructional — Electromechanical and Static Relays, Over-current, Directional, Differential, Distance Relays, etc. and their principles and applications.

Current Trend in Protective Relaying

Microprocessor and PC based Relaying

Switchgear

Classification of Switchgear, Fault Analysis, Symmetrical Faults on a Synchronous machine, Fault clearing process, Arcing phenomena and principles of arc interruption, AC and Dc circuit breakers, Different types of Circuit Breakers and their constructional features, Testing and Selection of Circuit Breakers.

List of Experiments:

- Study of protective relays and their working.
- To study the function of Buchholz relay.
- To draw the characteristics curves of percentage biased differential relay for various current setting and bias setting.
- To study the characteristics feature of inverse time over-current relay.
- Study of digital distance relay.
- Study of various types of Switchgears.
- Study of different types of faults occurring in Transmission Network.
- Study of various types of Protection Systems of Power Systems.
- Study of different types of Electromechanical and Static Relays.
- Study of different types of Circuit Breakers.
- Testing and application of Circuit Breakers.
- Study of different types of faults occurring in Circuit Breakers.
- Fault classification using MATLAB.

Suggested Books & References:

- The Elementary Council, *"Power System Protection"*, Vol. 1, 2 & 3, Peter Peregrinus Ltd., 1990.
- Van, A. R., & Warrington, C. *"Protective Relays: Their Theory and Practice"*, Vol. 1, & 2, Chapman and Hall, 1969.
- Paithankar, Y. G *"Transmission Aretwork Protection: Theory and Practice"* Marcel Dekker Inc., 1998.
- GEC Measurements, *"Protective Relays: Application Guide"* GEC Measurements, 1987.

PRACTICAL:

1. EE 1704-P Colloquium (0-0-3)

2. EE 1707-P Project — 1 (0-0-3)