CMPS Lab (ET-424E)

Week	Theory	Practical	
	Lecture Day	Practical Day	Topic
1st	1	1	Develop a program to do the following mathematical operations. i) Transpose of a matrix
	2		
	3		
	4		
2nd	5	2	Develop a program to do the following mathematical operations. i) Multiplication of two matrices
	6		
	7		
	8		
3rd	9	3	Develop a program to do the following mathematical operations. i) Addition & subtraction of two matrices.
	10		
	11		
	12		
Unit-II			
4th	13	4	The demand estimate is the starting point for planning the further electric power Supply. The consistency of demand growth over the year has led to numerous attempts to fit mathematical curves of this trend. One of the simplest curves is **P = Po exp {a (t – t_0)}** Where **a** is the average per unit growth rate P is the demand in year „t" in GW P_0 is the given demand at year t_0 in GW., a = 3.4 percent Develop a table to compute the system demand from 1984 to 2005 on yearly basis. Calculate also the average yearly demand over this period.
	14		
	15		
	16		
5th	17	5	You have been given with network data consisting of element no. starting node & end node. Develop a program to make element node incident matrix. A and covert it into Y_{bus} as incidence matrix. A by choosing any bus as reference. Element No. Starting node End node 1 1 2 2 1 6 3 2 3 4 3 4 5 4 5 6 6 5 7 1 5 8 3 5
	18		
	19		
	20		
6th	21	6	Write a program to formulate Y-Bus by non singular transformation**Y Bus = [A] t[y] [A],**
	22		
	23		
	24		
7th	**1st Minor Test**		
Unit-III			

8th	25	7	Viva-Voice – 1st
	26		
	27		
	28		
9th	29	8	Develop a program to solve a set of 4 simultaneous liner equations using Gaussian Elimination method
	30		
	31		
	32		
10th	33	9	Develop a program to calculate Z_{bus} of a given network using building algorithm. Assume that no mutual coupling is involved in between the different elements.
	34		
	35		
	36		
Unit-IV			
11th	37	10	The Gauss Seidel method is also known as the method of successive displacements. Use Gauss Seidel method to find the solution of following equations $x_1 + x_1x_2 + x_3 = 10$ $x_1 + x_2 + x_3 = 6$ $x_1 + x_2 - x_3 = 2$
	38		
	39		
	40		
12th	41	11	You have been given with a 6 bus system. Apply load flow technique using Gauss Seidel method to solve up to two iterations.
	42		
	43		
	44		
13th	45	12	Develop a program to find Eigen values for given Matrix
	46		
	47		
	48		
14th	**2nd Minor test**		
15th	49	13	Viva-Voice – 2nd
	50		
	51		
	52		

COMPUTER METHODS IN POWER SYSTEM (ET-402E)

Week	Theory		Practical	
	Lecture Day	Topic (Including assignment / Test)	Practical Day	Topic
Unit-I				
1st	1	Introduction to CMPS	1	
	2	General : Impact of computers		
	3	Orientation of engineering problems to computers		
	4	Review of matrices and matrix operations		
2nd	5.	Review of matrices and matrix operations		
	6.	Review of matrices and matrix operations and numerical problems		
	7	Incidence and Network Matrices: Network graph	2	
	8	Various incidence matrices		
3rd	9	1st Assignment		
	10	Generalized element representation		
	11	Primitive network and primitive network matrices	3	
	12	Formation of various network matrices by singular transformations		
4th	13	Formation of various network matrices by singular transformations		
	14	Formation of various network matrices by singular transformations		
	15	Inter-relations between various incidence matrices and network matrices		
	16	Numerical problems		
Unit-II				
5th	17	Bus Impedance matrix: Building algorithm for bus impedance matrix	4	
	18	Modification of bus impedance matrix for change of reference bus and for network changes		
	19	Formation of bus admittance matrix and modification		
	20	Numerical problems		
6th	21	Calculation of Z bus elements for Y Bus	5	
	22	Three-phase Elements: Representation of three-phase network elements		
	23	Three-phase Elements: Representation of three-phase network elements		
	24	Treatment under balanced excitation		
7th	**Minor Test**			
8th	25	Treatment under unbalanced excitation	6	
	26	Transformation matrices		
	27	Unbalanced elements		
	28	Short-Circuit Studies **:** Introduction		
Unit-III				
9th	29	Network short-circuit studies using Z bus		

	30	Short-circuit calculations using symmetrical components for various types of faults	7	
	31	Load-Flow Studies **:** Introduction		
	32	Importance of load flow studies		
10th	33	Classification of buses, Load-flow equations	8	
	34	Iterative methods: Computer algorithm and load flow solutions using Gauss Seidel method		
	35	Computer algorithm and load flow solutions using Newton-Raphson method		
	36	Decoupled and fast decoupled load-flow solutions		
11th	37	Representation of regulating and off-nominal ratio transformers	9	
	38	Comparison of load-flow solution methods		
	39	Sparsity: Introduction		
	40	Optimally ordered triangular factorization		
Unit-IV				
12th	41	Schemes of optimal ordering	10	
	42	Stability Studies: Introduction		
	43	Algorithmic flow chart		
	44	Transient stability solution using Modified Euler method		
13th	45	2nd Assignment	11	
	46	Numerical problems		
	47	Power System Security: Introduction		
	48	Contingency analysis using Z Bus and various distribution factors		
14th	**2nd Minor test**			
15th	49	Revision	12	
	50	Revision		
	51	Old university papers discussions		
	52	Old university papers discussions		

ELECTRIAL ENGINEERING MATERIALS & PROCESSES (ET-404-E)

Week	Theory	
	Lecture Day	Topic (Including assignment / Test)
1st	1	Conductors
	2	Properties of Conductors
	3	ACSR
	4	High resistivity material
2nd	5	Properties of High resistivity material
	6	Alloys
	7	Soldering materials
	8	Brazing materials
3rd	9	Super conductivity
	10	Super conductor materials
	11	Applications of Super conductor materials
	12	Assignment on conductors
4th	13	Insulators
	14	Classification of insulators
	15	Dielectric materials
	16	Glass & ceramics
5th	17	Refractory materials
	18	Uses of refractory materials
	19	Optical fibers
	20	Lasers & optoelectronic materials
6th	21	Semiconductor materials
	22	Properties of semi-conductor materials
	23	Thermosetting materials
	24	Thermoplast materials
7th		
8th	25	Classification of material
	26	Diamagnetic materials
	27	Paramagnetic materials
	28	Ferromagnetic materials
9th	29	Curie law
	30	Curie weiss law (Qualitative study)
	31	Ferromagnetism
	32	Qualitative study of domain theory
10th	33	Hysteresis phenomena
	34	Hard & soft magnetic material & their applications
	35	Ferrites
	36	Structure & property of ferrites
11th	37	Processes used in Plano technology
	38	Lapping
	39	Polishing
	40	Cleaning
12th	41	Masking
	42	Photolithography
	43	Diffusion
	44	Oxidation & Metallization

13th	45	Welding wire bonding
	46	Packaging & encapsulation
	47	Heating
	48	Induction & dielectric
14th		
15th	49	Electron beam welding
	50	Cutting
	51	Allnealing
	52	Cold & hot rolling

SPECIAL ELECTRICAL MACHINES (ET-408E)

Week	Theory	
	Lecture Day	**Topic (Including assignment / Test)**
1st	1	Introduction to Special Electrical Machines
	2	Principles and Types of FHP motors
	3	Uses in domestic & industrial applications
	4	Single phase Induction motors
2nd	5	Types of single phase Induction Motors.
	6	Related Problem Analysis
	7	Different Characteristics of SEM
	8	Qualitative examination
3rd	9	Starting of single phase Induction Motors.
	10	Running performance of IM
	11	Related Problems Solutions
	12	Assignment 1
4th	13	Introduction to Linear Induction Motors
	14	Different types of LIM
	15	Actuators and its principle of operation
	16	Introduction to Linear Levitated machine
5th	17	Different Applications of LLM
	18	Permanent magnet motors
	19	Related Problems Analysis
	20	High performance energy efficient machines
6th	21	Effect of E.M.F injected into secondary circuits
	22	Related quantitative study
	23	Scherbius System
	24	Schrage Motors.
7th	**Minor Test**	
8th	25	Introduction to Special Machines
	26	Special Induction Generators
	27	Special Induction Motors
	28	Special Machines associated with wind system
9th	29	Special Machines associated with Solar system
	30	Special Machines associated with Tidal
	31	Biogas and other non-conventional forms
	32	Applications of SEMs
10th	33	Related Problem Analysis
	34	Assignment 2
	35	Minor Test Discussion
	36	Overview about SEM used in nonconventional
11th	37	Introduction to Synchronous motors
	38	Introduction to series universal motors
	39	Stepper motors and its types
	40	Permanent magnet DC Motors
12th	41	Permanent magnet AC Motors
	42	Working principles of Switch Reluctance motor
	43	Servomotors and its types
	44	Shaded pole motors

13th	45	Brushless DC motors
	46	Different applications of SEM
	47	Applications in Computers, Electronics field
	48	Communications and Information Technologies.
14th		
14th		
15th	49	Related problem Analysis
	50	Overview about SEMs
	51	PPT.
	52	Special test and discussion

OPERATION RESEARCH (ET-406-E)

Week	Theory	
	Lecture Day	**Topic (Including Assignment/Test)**
1st	1	Development of operations Research ; characteristics and scope of operations Research
	2	Operations Research in Management
	3	Models in operations Research
	4	Model Formulation,
2nd	5	Types of mathematical models
	6	Limitations of operations Research
	7	L.P. models ; simplex method
	8	Algebra of simplex method
3rd	9	Problems and Solutions
	10	Minimization and Minimization problems
	11	The big M method
	12	Post Optimality analysis
4th	13	Essence of duality theory
	14	Application of sensitivity analysis
	15	Introduction to model, matrix terminology
	16	Formulation and solution of Transportation model
5th	17	Least cost method
	18	Voyel's Approximation method
	19	Least time transportation problem,
	20	Assignment problems
6th	21	Introduction to net work logic
	22	Numbering of events (Fulkersen Rule)
	23	PERT calculations ; Forward path and back-ward path; Slack
	24	Problems and Solutions
7th		**----------Ist Minor Test----------**
8th	25	Probability
	26	Comparison with PERT
	27	Critical path, Floats.
	28	Project cost, crashing the net wor
9th	29	Updating (PERT and CPM
	30	Introduction, applications of simulation
	31	Advantages and limitations of simulation
	32	Technique, generation of random numbers
10th	33	Time-flow mechanism , simulation languages
	34	Steps in decision theory approach
	35	Decision Machinery environment
	36	Decision machining under certainty and uncertainty , condition of risk
11th	37	Decision trees, Minimum enchained criteria,
	38	Definition of arguments models , comparison with transport model
	39	Mathematical representation of assignment model
	40	Formulation and solution of argument models
12th	41	Variation of the argument model, Alternate optimal solutions
	42	Introduction, Applications of queuing Theory
	43	Waiting time and idle time costs
	44	Single channel queuing theory and multi channel queuing theory with Poisson. arrivals and exponential services
13th	45	Numerical on single channel and multi channel queuing theory.
	46	Theory of games, competitive games, Rules and Terminology in game
	47	Theory, Rules for game theory- saddle point; dominance
	48	Problems and Solutions
14th		**----------2nd Minor Test----------**

15th	49	Mixed strategy (2 x2 games),
	50	Mixed strategy (2 x n games or m x 2 games),
	51	Mixed strategy (3 x3 games), two person zero sum games
	52	n-person zero sum games.