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**KG REDDY**

College of Engineering  
& Technology

*New Age Engineering...*

## **Hand Book 2017-18**

### **II Year B.Tech EEE** **About Aristotle Educational Society**

Aristotle Educational Society was established in 2000, with an aim of bringing quality Engineering and management education closer to the student's populace at large. The society is founded by experienced and visionary team of academicians, industrialists and NRI Entrepreneurs, whose valuable knowledge and experience are the guiding factors for K G Reddy College of Engineering & Technology (KGR CET). At KGR CET we are always for every driving improvements and innovation in education, is it infrastructure expansion or faculty talent acquisition. Our endeavor is to provide best of the class facilities and services to our students.

Twenty First Century society is considered to be a knowledge society. But many of our educationists and captains of industry are of the opinion that there is a significant mismatch between the kind of education students are equipped with from our institutions and the industry's expectations. It is precisely to bring down this gap that our focus is on continuous enhancement of both the technical skills as well as the soft skill of our students in order to compete and succeed in the global work places of tomorrow.

#### ***Vision:***

To be recognized as a reputable engineering college imparting value-based technical education by means of advanced curriculum, effective teaching methodologies and renewed research-oriented and entrepreneurial focus in order to introduce new-age, industry-driven engineers dedicated to lead the society.

#### ***Mission:***

- To offer career-guided technical education with continued focus on application of acquired knowledge and skills.
- To provide a scholarly learning environment for students and faculty enabling them to achieve personal and professional growth.
- To engage in intensive research and entrepreneurial development and thereby, contribute to the upcoming engineering challenges in the world.

### **Ten Rules to Transform Yourself into an Ideal Student and a Perfect Professional**

1. The first thing is punctuality. You are expected to be in your seat in the classroom by 9:00 am. However, 10 minutes of grace time is given to enter the class. If you arrive at the institute after 9:10 am and before 09:50 am you can attend the rest of the classes. From 10:00 am, no student will be allowed to gain entry into the campus. You are not permitted to enter the class after the commencement of the class (except 1<sup>st</sup> period) and should not leave a class before that class ends.
2. You should not leave the campus during the working hours (between 9:00 am and 4:15 pm) without prior permission from the principal. Students' who wishes to leave the campus for any reason may apply

for permission to the concerned Head who in turn forward the case to the Principal. The Principal may issue the Gate pass after getting the consent of the parent.

3. You must wear neat and clean formal dress. Your attire should be befitting to the status of a student doing a professional course. You must wear (display) the Identity Card as long as you are in the campus.
4. Use of mobile phones is strictly prohibited in the class rooms/ labs/ workshops/ library/computer labs/Offices and other prominent places.
5. All the interpersonal communication within the campus must be only in English. If mistakes, fear/tension, mother tongue influence etc. are your reasons for not speaking in English, you must realize that they are all part and parcel of the learning process. Unless you make mistakes and learn from your mistakes you will never be able to acquire good command over English. As you are all aware, good command over English paves the way for a good professional career.
6. In case there is any delay on the part of any teacher in entering your class, and as a result the students are idle, one of the students from your class (preferably CR) may contact the HOD/Academic Counselor for corrective measures/necessary arrangements. You should not be seen in corridors, canteen, and buses or anywhere outside your classroom/lab without carrying a permission letter. If you do not have any teaching hours you are advised to make use of your free time productively, by utilizing various facilities provided by the college like; Library, Digital Library, Language Lab, Sports Lounge etc. and widen your horizons.
7. You must actively participate in all academic and extracurricular activities like; Seminars/Workshops, Tech Fests, College Day and all the National Festivals and use them as a platform to present yourself and grow as a better individual.
8. As a student, you are expected to cultivate habits like practicing self discipline, showing dedication towards your studies and respecting the teachers and elders.
9. If any one of you has any complaints or grievances against the institution, you are always welcome to bring them to the notice of your respective departments and get your problems solved.
10. Never forget that you are always welcome to make your suggestions for the improvement of the institution. Your suggestions will be appreciated and implemented if they found to be good, innovative and helpful to us in offering better services to all of you.

## **Academic Regulations**

### **1. Holidays**

KGR CET strictly follows the holidays notified by JNTUH Academic calendar.

### **2. Attendance**

a) A student shall be eligible to appear for University Examinations, if he/she possesses an aggregate of at least of 75% of attendance in all the subjects.

b) A student will not be promoted to the next semester unless he/she satisfies the attendance requirement of the present semester / 1<sup>st</sup> year.

c) If any student wants to go on leave for three or four days, the parents should meet the academic Counselor of the class, to which the student belongs to, to get the permission.

d) Attendance is compulsory on the preceding and the proceeding days of any holiday.

### **3. Credit System**

The credit system is as per the JNTUH Course Structure and syllabus. Students can have the details by going through the syllabus books.

### **4. Distribution and weight age of marks:**

The performance of a student in each semester / I year shall be evaluated subject wise with a maximum of 100 marks for theory and 75 marks for practical subject.

<b>Subject</b>	<b>Internal Exam</b>	<b>Assignments</b>	<b>End semester Exam</b>	<b>Total Marks</b>
<b>Theory</b>	20	5	75	100
<b>Practical</b>	25	-	50	75

After a student has satisfied the requirements prescribed for the completion of the program and is eligible for the award of B. Tech. Degree he shall placed in one of the following 4 Classes:

Class Awarded	% of marks to be secured	
First class with Distinction	70 % and above	From the aggregate marks secures from the best 196 credits
First Class	Below 70% but not less than 60%	
Second Class	Below 60% but not less than 50%	
Pass Class	Below 50% but not less than 40%	

For further details on academic regulations, please refer the syllabus books.

## General Information

### Communication

In case any student or parent wants to contact the college authorities and put forward their views should communicate the same to the Head of the department/ Principal. Any change of address, the parents have to report it to the academic counselor concerned either personally or by making a phone call.

### Ragging

Ragging is strictly prohibited, on the campus and there is an anti-ragging squad working in the college premises and if any senior students are observed troubling the fresher's stringent action will be taken against the culprits and there should be no doubt in any body's mind about the commitment of the college authorities to crush the ragging with an iron hand.

### Library (Rules and Regulations)

The college has a spacious and well-stocked library with text books and reference books and several national and international journals and magazines. The stockpile of the books goes on increasing year after year to help students keep abreast of the latest information. All the students are advised to put the library to the optimum utilization and try to widen your knowledge. The Digital library is equipped with 14000+ on line E journals.

Titles	:	2920
Volume of books	:	22174
Print Journals	:	105
E-Journals	:	DELNET, IEEE, etc.
Seating Capacity	:	150
Timings	:	8 AM – 6 PM
Digital Library	:	30 systems, High speed Internet, 14000+ online journals

## II Semester

Description	Existing Period	Duration
Commencement of class work	07.12.2017	-
First mid examinations Timings 10.00 am to 12.00 Noon (Forenoon Session) 02.00 pm to 4.00 pm (After Noon Session)	07.02.2018 to 09.02.2018	(3 days)

Description	Existing Period	Duration
Submission of first midterm exam marks to University on or before	17.02.2018	-
Parent Teacher Meeting	10.03.2018	-
Last day of instruction	03.04.2018	
Second mid Examinations Timings 10.00 am to 12.00 Noon (Forenoon Session) 02.00 pm to 4.00 pm (AN)	04.04.2018 to 07.04.2018	(1 week)
Submission of second midterm exam marks to University on or before	17.02.2018	-
Preparation holidays and practical examinations	09.04.2018 to 14.04.2018	(1 week)
End Semester Examinations	16.04.2018 to 07.05.2018	
Summer Vacation	16.05.2018 to 11.06.2018	

## About the Department

Electrical and Electronics Engineering Department, established in the year 2008, is one of the oldest departments of K G Reddy College of Engineering and Technology. The Primary objective of the department is to impart quality education and training at the undergraduate level in the areas of Electrical and Electronics Engineering.

The Department has qualified and experienced faculty in all the related fields of Electrical and Electronics Engineering. The theoretical knowledge is further supplemented by well equipped laboratories. The department regularly organizes invited lectures by experts from industries in various fields of Electrical and Electronics Engineering. Workshops and Industrial visits are regularly conducted under the association of Electro Technia Association for Empowering (EAE).

The department is headed by **Mr. Khamruddin Syed, Associate Professor**, who is having vast academic and research experience. Students are encouraged to participate in various Workshops, Seminars, Conferences and technical competitions at various levels.

### Vision:

- To become a renowned department imparting both technical and non-technical skills to the students by implementing new engineering pedagogy's and research to produce competent new age electrical engineers.

### Mission:

- To transform the students into motivated and knowledgeable new age electrical engineers.
- To advance the quality of education to produce world class technocrats with an ability to adapt to the academically challenging environment.
- To provide a progressive environment for learning through organized teaching methodologies, contemporary curriculum and research in the thrust areas of electrical engineering.

### Contact Details of the Faculty:

Sl. No.	Name of the Faculty	Name of the Subject	Mobile	E-mail Id
1	Khamruddin Syed (HoD)	Power Systems-I	9848606081	syedkhamruddin@kgr.ac.in

2	N.Kiranmayi	BEFA	8142435767	kiranrunn@gmail.com
3	Ch. Ramaiah	Control Systems	9177850480	rams9091@gmail.com
4	G. Sireesha	Electrical Machines-II	9885856164	sireeshagavini@gmail.com
5	Spandana	STLD	8520945728	spandana@kgr.ac.in
6	Baburao	Gender Sensitization	9494243106	baburaogugulothu1985@gmail.com
7	M. Mahesh Kumar & G.Anjaneyulu	Control Systems Lab	8019425652, 9533696589	<a href="mailto:anjaneyulu@kgr.ac.in">anjaneyulu@kgr.ac.in</a> , maheshkumar.m@kgr.ac.in
8	G.Sireesha & Ch.Ramaiah	Electrical Machines-II Lab	9885856164, 9177850480	<a href="mailto:sireeshagavini@gmail.com">sireeshagavini@gmail.com</a> , rams9091@gmail.com
9	Ayesha Afreen	EC lab	9676919040	sd.ayesha89@kgr.ac.in

#### Mentor Details:

S. No.	Name of the Mentor	Mobile	Mentees Roll No.
1	G. Sireesha	9885856164	16QM1A0201-213
2	V. Shailaja	8096766126	16QM1A0214-223, 16C51A0209, 16UR1A0201
3	G. Pedda Reddy	9030441263	17QM5A0213-213
4	M. Prasanna Kumari	9618993753	17QM5A0215-220

#### Class In-charges:

S. No.	Name of the class in-charge	Mobile	E-mail Id
1	G. Sireesha	9885856164	sireeshagavini@gmail.com

#### Class Representative Details:

S. No.	Name of the CR	Roll No.	Mobile
1	VamsiRaj	17QM5A0218	9100393682
2	Ramya	16QM1A0204	7337085773

# COURSE DESCRIPTION DOCUMENTS

**Subject** : Switching Theory And Logic Design  
**Subject Code** : EC401ES  
**Name of the faculty** : P. SPANDANA  
**No of contact hours/week** : 4

## Course overview:

Basic introduction about design of digital systems, and number systems ,number base conversions, Boolean algebra and theorems, Minimization of Switching functions, Karnaugh map method, Tabulation method, Logic gates, Binary Adders, Carry look ahead Adder, Decoders, Encoders, Multiplexer, De-multiplexer, Sequential circuit Models, Flip Flops, Mealy Moore Models, Registers, Counters, FSM, limitations ,capabilities, ASM,ASM chart, Binary multiplier.

Test portion	
Test no.	Topics
1	L1-L37
2	L38-L60
Assignment portion	
Assignment no.	Topics
1	L1-L37
2	L38-L60

Submitted by:	Approved by:
(Signature of the faculty) Date:	(Signature of HOD) Date:

## Course Objectives:

*At the end of this course, the student will be:*

- CO1: **Analyze** the different base conversions of number system.
- CO2: **Evaluate** the Boolean Expressions using the theorems.
- CO3: **Design** the various types of combinational and sequential circuits.
- CO4: **Describe** the concept of FSM charts, mealy machine and Moore machines.
- CO5: **Identify** the various types of flip flops

## Course outcomes:

*At the end of this course the student should be:*

- **Define** fundamentals of digital circuits and Boolean algebra.

- **Describe** the differences between combinational and sequential circuits.
- **Apply** the karnaugh map method to minimize the various Boolean functions.
- **Analyze** the various types of flip flops.
- **Differentiate** the various types of memories.

Lecture no.	Topic to be covered	Topic outcome <i>At the end of the topic ,student will be able to</i>
L1	Introduction about Switching theory and logic design	Identify the fundamentals of digital systems.
L2	<b>Unit I: Number System and Boolean algebra And Switching Functions</b> : Review of number systems	Solve the problems on number conversions.
L3	Complements of Numbers	
L4	Codes-Binary Codes	
L5	Binary Coded Decimal Code and its Properties	Differentiate the various types of binary codes.
L6	Unit Distance Codes	Solve the problems Using properties
L7	Error Detecting and Correcting Codes.	
L8	<b>Boolean Algebra:</b> Basic Theorems and Properties	
L9	Switching Functions	Solve the problems using switching functions
L10	Canonical and Standard Form	Evaluate the canonical form the SOP and POS form.
L11	Algebraic Simplification of Digital Logic Gates	Simplify logical functions using Boolean algebra and theorems.
L12	Properties of XOR Gates	
L13	Universal Gates	Implement the logic circuit using NAND/NOR.
L14	Multilevel NAND/NOR realizations.	
L15	Problems & Revision	Recall all topics of unit-1.
L16	<b>UNIT - II Minimization and Design of Combinational Circuits:</b> Introduction	Recall the fundamentals of logic gates
L17	The Minimization of switching function using theorem	Simplify the combinational circuits using k-map
L18	The Karnaugh Map Method-Up to Five Variable Maps	Simplify the combinational circuits for 2,3, and 4 variables.
L19	Don't Care Map Entries	Simplify the logic function using don't care conditions.
L20	Tabular Method	Solve the problems using tabular method

L21	Design of Combinational Logic: Adders	Describe the various types of arithmetic circuits.
L22	Subtractors, comparators	Explain the importance of combinational logic design.
L23	Multiplexers, De multiplexers	Describe the various types of multiplexers.
L24	Decoders	Explain the importance of combinational logic design.
L25	Encoders and Code converters	
L26	Hazards and Hazard Free Relations	Evaluate the hazard and hazard free relations.
L27	Revision	Recall all topics of unit-2
L28	<b>UNIT - III Sequential Machines Fundamentals and Applications:</b> Introduction	Differentiate the combinational and sequential circuits.
L29	Basic Architectural Distinctions between Combinational and Sequential circuits	
L30	The Binary Cell, Fundamentals of Sequential Machine Operation	Explain the fundamentals of sequential machine
L31	Latches, Flip Flops: SR	Identify the importance of flip flop and latch.
L32	JK, Race Around Condition in JK	Identify the importance of clock skew and triggering.
L33	JK Master Slave, D and T Type Flip Flops	
L34	Excitation Table of all Flip Flops	Solve the problems on the conversion of flip flops.
L35	Design of a Clocked Flip-Flop, Timing and Triggering Consideration	Identify the importance of clock skew and triggering.
L36	Clock Skew, Conversion from one type of Flip-Flop to another.	
L37	Registers and Counters: Shift Registers	Identify the importance of shift registers
L38	Data Transmission in Shift Registers	
L39	Operation of Shift Registers	Identify the importance of shift registers
L40	Shift Register Configuration	Differentiate & Design various type of counters
L41	Bidirectional Shift Registers, Applications of Shift Registers	
L42	Design and Operation of Ring and	Identify the importance of counters.



	Twisted Ring Counter	
L43	Operation Of Asynchronous And Synchronous Counters.	
L44	Revision	Recall all topics of unit-3
L45	<b>UNIT – IV Sequential Circuits - I:</b> Introduction, State Diagram	Explain the state diagram
L46	Analysis of Synchronous Sequential Circuits	Design the asynchronous sequential circuits.
L47	Approaches to the Design of Synchronous Sequential Finite State Machines	
L48	Synthesis of Synchronous Sequential Circuits	Synthesize the synchronous sequential circuits.
L49	Serial Binary Adder, Sequence Detector	
L50	Parity-bit Generator, Design of Asynchronous Counters	Design the asynchronous sequential circuits.
L51	Design of Synchronous Modulo N – Counters.	Design the synchronous sequential circuits.
L52	Revision	Recall all topics of unit-4
L53	<b>UNIT – V Sequential Circuits - II:</b> Finite state machine-capabilities and limitations	Identify the importance of FSM.
L54	Mealy and Moore models	Evaluate the functions using mealy, moore and merge chart method
L55	Mealy and Moore models	
L56	minimization of completely specified and incompletely specified sequential machines	Implement various applications using FSM.
L57	minimization of completely specified and incompletely specified sequential machines	
L58	Partition techniques	Identify the importance of ASM.
L59	Merger chart methods-concept of minimal cover table	Explain the importance of data path and control subsystem.
L60	Merger chart methods-concept of minimal cover table	

**Text Books:**

1. Switching and Finite Automata Theory- ZviKohavi&Niraj K. Jha, 3rd Edition, Cambridge.
2. Digital Design- Morris Mano, PHI, 3rd Edition.

**Reference Books:**

1. Digital Design – Morris Mano, PHI ,3<sup>rd</sup> Edition.
2. Switching and Finite Automata Theory – ZviKOhavi&Niraj K.jha, 3<sup>rd</sup> Edition
3. Introduction to switching Theory and logic Design,Fredriac j.Hill,GeraldR.Peterson,3<sup>rd</sup> Edition.

**Activities in the class:**

1. Solving the Mathematical Problems by giving Examples.
2. Quiz/Discussion of objective type questions before mid exams.
3. Slip tests will be conducted at the end of each unit.

**Grading:**

- 5 marks for seminar
- ½ Mark For Each Correct Answer @ Quiz.

**Basic Ground Rules:**

- Usage of mobile phone in class is not allowed.
- Students must wear their ID cards.

**Evaluation Scheme:**

Internal Assessment (sum of scores obtained in two tests)	20
Assignments	05
End Semester Examination	75
<b>Total</b>	<b>100</b>

<b>Subject</b>	: Business Economics and Financial Analysis
<b>Subject Code</b>	: SM405MS
<b>Name of the faculty</b>	: N. KIRANMAYI
<b>No of contact hours/week</b>	: 3

**Course Overview:**

Course Overview : This course covers major aspects of understanding the basic concepts of management and approaches to solve the problems from managerial point of view. This covers history of management and contributions of important management researchers, organizational structures, delegation of authority and use of power to influence people to get the work done through proper communication and control. Various optimization techniques were used to help out in decision making. In order to achieve organizational goals it is necessary to coordinate men, materials, money and machines against the background of several controllable and non-controllable factors such as technology, competition etc. In this regard various aspects covers related to concepts of human resource management, process of corporate planning, environmental analysis, strategy formulation and implementation, materials management, productivity and production, work study and introduction to marketing and at the end outlined contemporary practices of management like Total Quality Management, ISO 9000 – 2000 series, Six sigma and Business process reengineering and Balanced score card.

<b>Test Portion</b>	
<b>Test No.</b>	<b>Topics</b>
1.	L1 to L35
2.	L36 to L62

Assignment Portion	
Assignment No.	Topics
1.	L1 to L35
2.	L36 to L62

Submitted by:  
 (Signature of the faculty)  
 Date:

Approved By:  
 (Signature of HOD)  
 Date:

**Course Objectives: At the end of this course, students will be able to**

- CO1: Attain the knowledge of business and management principles for effective decision making.
- CO2: Identify how organizational design help in communications, productivity, and innovation.
- CO3: Recognize the insight of operations in the organization in achieving competitive advantage.
- CO4: Associate the flow of materials and record maintenance in an organization.
- CO5: Formulate effective marketing strategy keeping in view different forces in the environment.
- CO6: Distinguish the policies and practices of HR in the organization.
- CO7: Examine the projects to complete within time and less cost.
- CO8: Formulate and take managerial decisions and actions for survival of the organization.
- CO9: Learn how organizational learning helps in implementing world class practices in the organization.

**Course outcomes: On completion of the course the student will be able to**

1. Differentiate functional roles and their importance in business context.
2. Apply analytical, critical thinking and problem solving skills in a business context.
3. Compute using quantitative techniques in problem solving.
4. Describe materials management in the organization.
5. Apply the appropriate marketing strategy for the business.
6. Choose HR policies that help the organization in achieving the employee satisfaction and retaining the employees.
7. Choose the projects that can be completed within the time by optimum utilization of resources.
8. Identify the strengths, weakness, opportunities and threats of the organization and can formulate the business strategies to survive in the global environment.
9. Identify the importance of quality or minimum errors in the organization with wide application of different practices of management.

Lecture No.	Topic to be covered	Topic outcome
	<b>Unit-I Introduction to Business and Economics:</b>	
L1	Business: Structure of Business Firm	Learn about the process of business firm.

L2	Theory of Firm,	Know earning of profit
L3	Types of Business Entities, Limited Liability Companies,	Analyze different types of business forms
L4	Sources of Capital for a Company,	Identify different types of sources of capital
L5	Non-Conventional Sources of Finance.	know innovative source of finance
L6	Economics: Significance of Economics, Micro and Macro Economic Concepts,	Know the concepts of economics for decision making
L7	Concepts and Importance of National Income, Inflation, Money Supply in Inflation	Learn the impact of national income and inflation on money supply
L8	Business Cycle, Features and Phases of Business Cycle	Investigate the impact of business cycle to develop economy
L9	Nature and Scope of Business Economics, Role of Business Economist	Understand the role and scope of business economics for decision making
L10	Multidisciplinary nature of Business Economics.	Learn other areas covered by business economics
	<b>Unit-II Demand and Supply Analysis:</b>	
L11	Elasticity of Demand: Elasticity, Types of Elasticity	Examine the impact of elasticity of demand for price making decision.
L12	Law of Demand, Measurement and Significance of Elasticity of Demand,	Understand the law of demand and the impact of significance and measurement of elasticity of demand.
L13	Factors affecting Elasticity of Demand, Elasticity of Demand in decision making,	Know different factors of elasticity of demand for decision making.
L14	Demand Forecasting: Characteristics of Good Demand Forecasting, Steps in Demand Forecasting	Identify different characteristics and steps of demand forecasting for developing sales.
L15	Methods of Demand Forecasting	Understand different methods of demand forecasting for decision making on product.
L16	Methods of Demand Forecasting	Understand different methods of demand forecasting for decision making on product.
L17	Supply Analysis: Determinants of Supply,	Learn the impact of supply with compare to price and other factor.
L18	Supply Function & Law of Supply.	Know about supply functions and law of supply for product development.
L19	Review	Briefly understand overall topics
	<b>Unit-III Production, Cost, Market Structures &amp; Pricing:</b>	

L20	Production Analysis: Factors of Production, Production Function,	Classify various types of production functions of optimum utilization of resources.
L21	Production Function with one variable input,	Know the impact of one variable input on outcome
L22	two variable inputs	Know the impact of two variable input on outcome
L23	Cost analysis: Types of Costs	Understand different cost concepts for optimum utilization of resources
L24	Short run and Long run Cost Functions.	Analyze the impact of short run and long run cost to minimize the cost and maximize revenue.
L25	Market Structures: Nature of Competition,	Describe various Types of markets competitions
L26	Features of Perfect competition, Monopoly, Oligopoly Monopolistic Competition	Understand different features of perfect competition, monopoly ,monopolistic competition
L27	Pricing: Types of Pricing	Analyze the impact of price for decision making
L28	Product Life Cycle based Pricing, Break Even Analysis	Understand about product life cycle for product development
L29	Break Even Analysis, Cost Volume Profit Analysis.	Analyze the impact of BEP for profit decision
L30	Review	
	<b>Unit-IV Financial Accounting:</b>	
L31	Introduction of account	Understand different accounting terms for making transactions
L31	Accounting concepts and Conventions	Know the impact of accounting concepts and convention for understanding accounting rules and polices.
L32	Accounting Equation, Double-Entry system of Accounting,	Examine the process of accounting equation and double entry system of accounting.
L33	Rules for maintaining Books of Accounts,	Understand the rules of accounting to financial statements
L34	Journal	Analyze the process of making journal entries.
L35	Journal	Analyze the process of making journal entries
L36	Posting to Ledger	Analyze the process of posting ledger

		to separate individual transactions
L37	Posting to Ledger, Preparation of Trial Balance,	Understand posting ledger and trial balance for without errors
L38	Elements of Financial Statement	Know different elements of financial statements for good or bad of business
L39	Preparation of Final Accounts.	Examine different kinds of final accounts for decision making
L40	Preparation of Final Accounts.	Examine different kinds of final accounts for decision making
L41	Preparation of Final Accounts.	Examine different kinds of final accounts for decision making
	<b>Unit-V Financial Analysis through Ratios</b>	
L42	Concept of Ratio Analysis, Liquidity ratios	Understand different concepts of ratios for financial decision making.
L43	Liquidity Ratios	Examine the impact of liquidity ratios for short term financial decision making.
L44	Turnover Ratios	Examine the impact of turnover ratios to know efficiency of the business
L45	Turnover Ratios,	Examine the impact of turnover ratios to know efficiency of the business
L46	Profitability Ratios,	Examine the impact of profitability ratios to know profitability and capacity of business earnings.
L47	Profitability Ratios,	Examine the impact of profitability ratios to know profitability and capacity of business earnings
L48	Solvency, Leverage Ratios (simple problems).	Analyze the impact of solvency and leverage ratios for long term decision making.
L49	Introduction to Fund Flow and Cash Flow Analysis (simple problems)	Understand the procedure of funds flow and cash flow statement for inflow and outflow of fund.
L50	Introduction to Fund Flow and Cash Flow Analysis (simple problems)	Understand the procedure of funds flow and cash flow statement for inflow and outflow of fund
L51	Introduction to Fund Flow and Cash Flow Analysis (simple problems)	Understand the procedure of funds flow and cash flow statement for inflow and outflow of fund

#### **MID EXAM-II**

**Textbook:**

1. A R Aryasri, Managerial Economics and financial analysis, TMH, New Delhi.
- 2.S.A siddqu, Managerial Economics and financial analysis, HPH, New Delhi.

3. D.D.Chaturvedi, S.L.Gupta, Business Economics – Theory and Applications, International Book House Pvt. Ltd. 2013.

4. Dhanesh K Khatri, Financial Accounting, Tata McGraw Hill, 2011.

5. Geethika Ghosh, Piyali Gosh, Purba Roy Choudhury, Managerial Economics, 2e, Tata McGraw Hill Education Pvt. Ltd. 2012.

### **Reference books:**

1. Paresh Shah, Financial Accounting for Management 2e, Oxford Press, 2015.
2. S.N.Maheshwari, Sunil K Maheshwari, Sharad K Maheshwari, Financial Accounting, 5e, Vikas Publications, 2013.
3. D.D.Chaturvedi, S.L.Gupta, Business Economics – Theory and Applications, International Book House Pvt. Ltd. 2013.
4. Dhanesh K Khatri, Financial Accounting, Tata McGraw Hill, 2011.
5. Geethika Ghosh, Piyali Gosh, Purba Roy Choudhury, Managerial Economics, 2e, Tata McGraw Hill Education Pvt. Ltd. 2012.

### **Activities in class:**

- After completion of every class students have to write 1 or 2 keynote points.
- After completion of every unit students have to give presentations on the covered unit.
- For every 2 units one quiz will be conducted.
- All the assessment, quiz and presentations marks are considered for external exam as assignment marks.

### **Grading:**

- For Presentations I will follow Rubrics based on Interaction, Body language, Confidence level, Audibility & Knowledge.
- For Quiz and keynote points, 1 mark for their correct answers and considered for external exam marks.

### **NOTE:**

- Assessments should be submitted in time
  - Accessing the mobile phones is not acceptable in the class.
- |   |                |
|---|----------------|
| ● Internal Assessment (sum of scores obtained in two tests) | – 20 M         |
| ● Assignments   | - 5 M          |
| ● End Semester Examination                                  | - 75 M         |
| <b>Total</b>  | <b>- 100 M</b> |

**Subject** : POWER SYSTEMS-I  
**Subject Code** : EE402ES  
**Name of the Faculty** : Khamruddin Syed  
**No of contact hours/week** : 5

## Course Overview:

The course provides an overview of the Generation and Distribution of power along with the economic concepts. The course focuses on various methods for solving the DC & AC distribution parameters. Basic information is also provided on the types of tariffs. The course also includes a detailed study about different types of substations.

Test Portion	
Test No.	Topics
1	L1-L26
2	L27-L64
Assignment Portion	
Assignment No.	Topics
1	L1-L26
2	L27-L64

Submitted by	Approved by
(Signature of the faculty) Date:	(Signature of HOD) Date:

## Course Objectives:

At the end of this course, the student should be able to:

1. Explain about the power plants.
2. Predict the locations and various equipment in the sub stations, devices protecting from the faults.
3. Solve the DC and AC distribution calculations.
4. List out all the power factor improvement techniques and voltage control techniques.
5. Define the economical aspects in power generation and transmission.

## Course Outcomes:

At the end of this course the student will be able to:

- Identify about the generation of power conventionally.
- Draw the Line diagrams of all the power stations.
- Compare between the air insulated and gas insulated substations as well.
- Calculate the voltage distributions, current, power in various feeders and distributors.
- Apply the techniques in industries for power quality.

Lecture No.	Topic to be covered	Topic outcome
<b>At the end of the topic, the student will be able to</b>		
L1	Introduction about subject	Identify the course outcomes
L2	UNIT-I: Power Stations	Explain about power plants
L3	Line diagram of TPS	Draw the LD showing components
L4	TPS components	List the components
L5	Nuclear Power stations	Outline the importance of Nuclear power stations in generation



Lecture No.	Topic to be covered	Topic outcome
L6	Nuclear Power stations	Outline the importance of Nuclear power stations in generation
L7	Nuclear Power stations	Outline the importance of Nuclear power stations in generation
L8	Gas power stations	Explain the operation of gas power plants
L9	Block diagram approach	Show the components in blocks
L10	UNIT-II: Elements of Hydro Electric Power Station	List the components in a HEPS
L11	Types of HEPS	Classify the types of HEPS
L12	Concept of pumped storage plants	Explain pumped storage plants
L13	Mass curve (explanation only) estimation of power developed from a given catchment area	Draw mass curve and estimate the power developed
L14	Heads and efficiencies	Calculate the Heads and efficiencies
L15	Classification of turbines, impulse and reaction turbines	Classify and explain the working operation of turbines
L16	Pelton wheel, Francis turbine and Kaplan turbine-working proportions	Classify and explain the working operation of turbines
L17	work done, efficiencies , hydraulic design - draft tube- theory- functions and efficiency	Calculate the work done, efficiencies
L18	Work done, efficiencies , hydraulic design - draft tube- theory- functions and efficiency	Calculate the work done, efficiencies
L19	UNIT-III: Classification of Distribution systems	Classify the Distribution system
L20	Comparison of AC/DC Distribution system and underground/overhead	Compare Distribution based on supply and layout
L21	Design features of distribution	Identify the requirements for designing the distribution systems
L22	Problems	Calculate the Voltage drops
L23	Problems	Solve DC distribution problems
L24	Problems	Solve DC distribution problems
L25	Radial and Ring Main distributors for DC	Derive Expression for DC Voltage drop in Radial and Ring main Distributors
L26		
<b>I MID EXAMINATION</b>		
L27	Problems	Solve voltage drop calculations
L28	Radial and Ring Main distributors for AC	Derive Expression for AC Voltage drop in Radial and Ring main Distributors
L29		
L30		
L31	Power factors in ac and dc distributions	Describe the effects of power factor with respect to the loads
L32		
L33	Problems	Calculate the power factors
L34	UNIT-IV: AIS & GIS	Outline the substations
L35	Indoor and Outdoor substations	Classify the substations
L36	Substations layout	Locate the substations
L37	Bus bar arrangements	Discuss about the arrangement of bus bars
L38	Single bus bar arrangement	Explain bus bars
L39	Sectionalized single bus bar	Explain Sectionalized bus bars
L40	Main bus bar arrangements	Differentiate between main and transfer bus bars
L41	Transfer bus bar arrangements	
L42	Practice of bus bar diagrams for different voltage levels	Draw the bus bar arrangements
L43		
L44	Revision	Recall and Summarize the topics
L45		
L46	Advantages of GIS	List the advantages of GIS
L47	Types of GIS	Classify types of GIS
L48	Single line diagram of GIS	Draw the Single line diagram of GIS
L49	Construction aspects of GIS	Design a prototype of GIS
L50	Maintenance of GIS	Change the parameters depending upon the maintenance required with respect to system changes
L51	Comparison of AIS & GIS	Compare both types of substations
L52		
L53	UNIT-V: Economic aspects & Tariffs	Define Load Curve and Load duration Curve
L54	Simple Problems	Solve problems on economic aspects

Lecture No.	Topic to be covered	Topic outcome
L55	Costs of generation	Estimate the sample costs of generation
L56	Types of tariffs	Classify the types of tariffs
L57	Flat and Block rate tariff	Explain the Flat and Block rate tariffs
L58	Two part and three part tariffs	Discuss 2 part and 3 part tariffs
L59	Power factor tariffs	Apply the concepts for electricity bill generated in any industry
L60	Electricity bill example	Illustrate the cost of units consumed for their energy bill
L61	Problems	Calculate tariffs for different types of loads
L62	Open book and closed book exams	Assess the topics learnt and measure their performance levels
L63		
L64	Revision of all the units	Recall and Summarize the topics
<b>II MID EXAMINATION</b>		

### Text Books:

1. Principles of Power Systems by V. K. Mehta and Rohit Mehta, S. Chand & Company Pvt. Ltd, New Delhi, 2004.
2. Electrical Power Systems by P. S. R. Murthy, BS Publications.

### Reference Books:

1. A Text book of Power System Engineering by R. K. Rajput, Laxmi Publications (P) Limited.
2. Electrical Power Generation, Transmission and Distribution by S. N. Singh, PHI.
3. Electrical Power Systems by C. L. Wadhwa, New Age International (P) Limited, Publishers.
4. Generation of Electrical Energy by Dr. B. R. Gupta, S. Chand & Company Pvt. Ltd, New Delhi.

### Activities in the class:

- One Minute paper in every lecture.
- Seminars by Students after completion of every unit.
- Think-Pair-Share activity is conducted at least once in a week.
- Quiz related to specific topic is conducted twice in a semester.
- Jigsaw activity is conducted once in a semester.
- Note check is performed whenever necessary.

### Grading Criteria and Evaluation Scheme:

Internal Exam I (10 Descriptive+ 10 Objective+ 5 Assignments)	:	<b>25</b>
Internal Exam II (10 Descriptive+ 10 Objective+ 5 Assignments)	:	<b>25</b>
Total internal Marks (Average of Internal Exam I and Internal Exam II)	:	<b>25</b>
University Exam Marks	:	<b>75</b>
<b>Total Marks</b>	:	<b>100</b>

### Ground Rules:

- Attendance should be regular.
- Avoid cell phones in the class room as well as in the examination hall.
- Copying of the assignments is strictly prohibited according to plagiarism.
- Punctuality and Discipline is must in the class.
- Assignment marks can be written or activity. Hence presence is must.

### Evaluation Scheme:

Internal Exam I (10 Descriptive+ 10 Objective+ 5 Assignments)	:	<b>25</b>
Internal Exam II (10 Descriptive+ 10 Objective+ 5 Assignments)	:	<b>25</b>
Total internal Marks (Average of Internal Exam I and Internal Exam II)	:	<b>25</b>
University Exam Marks	:	<b>75</b>
<b>Total Marks</b>	:	<b>100</b>

<b>Subject</b>	: Electrical Machines-II
<b>Subject Code</b>	: EE403ES
<b>Name of the faculty</b>	: G. Sireesha
<b>No of contact hours/week</b>	: 5

**Course Overview:**

As an extension of electrical machines-1 course this subject facilitates the study of performance of transformers and induction motors which are the major part of industrial drives and agricultural pump sets.

<b>Test Portion</b>	
Test no.	Topics
1	L1-L31
2	L32-L63
<b>Assignment Portion</b>	
Assignment no.	Topics
1	L1-L31
2	L32-L63

<b>Submitted by</b>	<b>Approved by</b>

(Signature of the faculty) Date:	(Signature of HOD) Date:
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**Course Objectives:**

At the end of this course the student will be able to:

1. Prepare the students to analysis of transformers.
2. Design a practical transformer.
3. Equip the students with the knowledge of the electrical machines.
4. Identify different types of synchronous and induction machines.

**Course Outcomes:**

Upon successful completion of this course the students should be able to:

1. Differentiate between transformers and other rotating electrical machines.
2. Apply and design three-phase circuits in electrical machines.
3. Analyze characteristics of dc motors and three-phase induction motors.
4. Analyze areas of application of transformers and induction machines.

LECTURE NO.	TOPIC TO BE COVERED	TOPIC OUTCOME (Upon the completion of this topic the student will be able to)
L1	Unit-I: Poly-phase induction motors- construction	Perceive the construction of poly-phase induction motors.
L2	Details of cage and wound rotor machines	Interpret the details of cage and wound rotor machines.
L3	Production of a rotating magnetic field	Examine the production of rotating magnetic field and principle of operation.
L26	Unified principle of operation of alternators: working principle	To understand principle of alternator
L4	Rotor emf and rotor frequency	Analyze the terms rotor frequency and rotor emf.
L27- L28	Construction- types of Alternators	To understand construction of alternator
L29- L30	Rotor reactance, rotor current and pf at standstill and during operation.	Contrast the effect on rotor reactance, rotor current and pf at standstill and during operation.
L31	windings –lap & wave	To know types of armature windings –lap & wave
L7-L8 & L9	Rotor power input, rotor copper loss and mechanical power developed	Calculate rotor power input, rotor copper loss and mechanical power developed
L32	Concentric and distributed armature winding and their inter-relation.	Understand concentric and distributed armature winding and inter-relate all the above.
L10	distribution, pitch and winding factors	Able to understand armature winding factors
L11- L12	Unit-II Torque equation	Derive the torque equation.
L13	Deduction from torque equation	Interpret how to deduct from torque equation.
L34	Derived emf equation of an alternator	Able to understand emf equation of alternator
L14	Expressions for maximum torque and starting torque	Derive expressions for maximum torque and starting torque.
L15	Torque-slip characteristics	Design the torque-slip characteristic.
L16	Equivalent circuit methods for reducing harmonics in output wave-form.	To know design the equivalent circuit in emf wave-form, suppression of harmonics
L17	Phasor diagram	Construct the phasor diagram.
L18	Crawling and cogging	Analyze the terms crawling and cogging
L37- L38	Discussed about armature takes place in alternators-leakage reactance	Infer the effect of no load and blocked rotor tests on induction motors.
L19	No load and blocked rotor tests	Able to know armature reaction-leakage reactance
L20- L21	Predetermination of performance place in alternators-synchronous reactance and impedance	Predetermine the performance on induction motors.
L22	Methods of starting and starting current and torque calculations.	Inspect the methods of starting and starting current and calculate the torque.
L23	Change of frequency	Analyze the change of frequency.
L40	phasor diagram	Draw the phasor diagram of Alternator.
L41	Change of poles, cascade connection	Perceive the change of poles and analyze the cascade connection.
L24	load characteristics	Explain the load characteristics
L42	Injection of an emf into rotor circuit (parallel treatment)	Identify the effect of injection of an emf into rotor circuit.
L43	synchronous impedance-principle of operation graphical method for regulation	Know how to calculate regulation by various methods-synchronous impedance .
L43	procedure for calculating synchronous impedance method graphical method for	Able to know, how to calculate regulation by various methods-M.M.F method

	regulation	
L44	procedure for calculating regulation by zero power factor	Able to know, how to calculate regulation by various method-zero power factor method
L45	Discussed problems for calculating regulation by ampere turn method graphically	Able to know, how to calculate regulation by various method-zero power factor method
L46	Explained two reaction theory for salient pole alternators	Able to apply salient pole alternators for two reaction theory analysis
L47	experimental determination of $X_d$ and $X_q$ (Slip test) Phasor diagrams	Able to determine the of $X_d$ and $X_q$
L48	Regulation of salient pole alternators	Able to know regulation salient pole alternators
L49	Unit-IV Explained how to synchronized alternators with infinite bus bars	To understand synchronizing alternators with infinite bus bars
L50	Discussed synchronizing power torque.	To know synchronizing power torque
L51	Discussed conditions for parallel operation and how load sharing	Able to know parallel operation and load sharing.
L52	Effect of change of excitation and mechanical power input	To understand effect of change of excitation and mechanical power input
L53	Explained analysis of short circuit current wave-form	Able to know analysis of short circuit current wave form
L54	Explained about sub-transient, transient	Able to determination of sub-transient
L54	Explained about transient and steady state reactance's	Able to determination of transient and steady state reactance's
L55	Explained synchronous motor working principle	Apply theory of operation of synchronous motor
L56	Analysis of variation of current, power factor with excitation	Able to know variation of current and power factor with excitation.
L57	synchronous condenser	Get knowledge on synchronous machines
L58	derive mathematical analysis for power developed	To derive mathematical analysis for power developed for synchronous motor
L59	Discussed hunting and suppress in synchronous motors	Able to know hunting in synchronous motors
L60	Discussed methods starting for synchronous induction motor	Able to various methods for starting for synchronous induction motor
L61	Unit-V Explained in detailed operation of single phase induction motor and types	To know single phase induction motor working and types
L62	Constructional feature	To know single phase induction motor Constructional features
L63	Analytically, explained double field revolving theory	Able to know double field revolving theory
L64	Analytically, explained theory and operation of split phase	Able to know theory and operation of split phase

L65	Analytically, explained theory and operation of shaded pole motors	Able to know theory and operation of split phase and shaded pole motors
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**Reference  
Books:**

1. Electrical Machines by PS Bhimbra, Khanna Publishers.
2. Principles of Electrical Machines by V. K. Mehta & Rohit Mehta, S. Chand Publishing.

**Activities in the class:**

- After completion of every class students should write summary of what has been said in the class.
- After completion of every unit a test will be conducted.
- For every two or three units a quiz or presentation will be held.
- All the assessment, quiz and extra activities marks will be considered for the evaluation of the mid papers.

**Grading:**

- For presentations I will follow rubrics based on interaction, body language, confidence level, audibility and knowledge.
- For quiz and key note points, one mark for the correct answers and will be considered for internal evaluation.

**Note:**

- Assignments should be submitted on time.
- Accessing mobiles during class hours is not permitted.

**Evaluation Scheme:**

Internal Exam I (10 Descriptive+ 10 Objective+ 5 Assignments)	:	<b>25</b>
Internal Exam II (10 Descriptive+ 10 Objective+ 5 Assignments)	:	<b>25</b>
Total internal Marks (Average of Internal Exam I and Internal Exam II)	:	<b>25</b>
University Exam Marks	:	<b>75</b>
<b>Total Marks</b>	:	<b>100</b>

<b>Subject</b>	: CONTROL SYSTEMS
<b>Subject Code</b>	: EE404ES
<b>Name of the faculty</b>	: M.MAHESHKUMAR
<b>No. of contact hours/week</b>	: 5

**Course overview:**

From this course students can understand the principles and applications of control system in daily life. This deals with basic concepts of block diagram reduction, signal flow graph, time domain analysis, analysis to time invariant systems and also with the different aspects of the stability analysis of the system in frequency domain and time domain.

<b>Test portion</b>	
<b>Test No.</b>	<b>Topics</b>
<b>1</b>	L1-L35
<b>2</b>	L36-L60
<b>Assignment portion</b>	
<b>Assignment No.</b>	<b>Topics</b>
<b>1</b>	L1-L35
<b>2</b>	L36-L60



<b>Submitted by:</b>	<b>Approved by:</b>
(Signature of the faculty) Date:	(Signature of HOD) Date:

**Course Objectives:**

*At the end of this course, the student will be able to:*

1. Classify different types of control systems
2. Analyze system stability both in frequency and time domains
3. Derive the characteristic equation of the transfer function
4. Draw the Bode Plot, Nyquist plot, polar plot & Root locus and compute Gain margin & phase margin from Various plots and to find the Stability of the system
5. Solve the Time invariant state Equations

**Course Outcomes:**

*Upon successful completion of this course, the student will be able to:*

1. Determine and use models of physical systems in forms suitable for use in the analysis and design of control systems.
2. Solve system equations in state-variable form (state variable models).
3. Determine the time and frequency-domain responses of first and second-order systems to step and sinusoidal (and to some extent, ramp) inputs.
4. Determine the (absolute) stability of a closed-loop control system
5. Apply root-locus technique to analyze and design control systems.

Lecture no.	Topic to be covered	Topic outcome
<i>At the end of the class, student will be able to</i>		
L1	<b>UNIT-I</b> Introduction	Discuss the importance of control systems
L2	Different examples of control systems- Classification of control systems	Define a system and control system and differentiate open loop and closed loop control systems.
L3	Feed-Back Characteristics, Effects of feedback	Analyze the feedback (positive and negative) characteristics and effects on different systems
L4	Feed-Back Characteristics, Effects of feedback	Analyze the feedback (positive and negative) characteristics and effects on different systems
L5	Mathematical models of different systems, Problems in mathematical modeling	Get knowledge on mathematical model of a control system for analyzing the stability
L6	Analogy of mechanical and electrical systems, Transfer functions of translational and rotational systems	Get knowledge on mathematical model of a control system for analyzing the stability
L7	Analogy of mechanical and electrical systems, Transfer functions of translational and rotational systems	Get knowledge on mathematical model of a control system for analyzing the stability
L8	Block Diagram Concept	Compute the transfer function of different systems using block diagram reduction technique
L9	Block Diagram Concept	Compute the transfer function of different systems using block diagram reduction technique
L10	Signal flow graph - Reduction using Masons gain formula	Analyze the stability of electrical networks by signal flow graph and masons gain formula
L11	Signal flow graph - Reduction using Masons gain formula	Analyze the stability of electrical networks by signal flow graph and masons gain formula

Lecture no.	Topic to be covered	Topic outcome
<i>At the end of the class, student will be able to</i>		
L12	Signal flow graph - Reduction using Masons gain formula	Analyze the stability of electrical networks by signal flow graph and masons gain formula
L13	<b>UNIT-II</b> Standard test signals - Time response of first order systems	Describe the standard test signals and Compute the time response of 1st order system for different inputs
L14	Standard test signals - Time response of first order systems	Describe the standard test signals and Compute the time response of 1st order system for different inputs
L15	Standard test signals - Time response of first order systems	Describe the standard test signals and Compute the time response of 1st order system for different inputs
L16	Characteristic Equation of Feedback control systems	Derive the characteristic equation of the transfer function
L17	Transient response of second order systems - Time domain specifications	Determine the time response of 2nd order system and Calculate transient and steady state time period of a system
L18	Transient response of second order systems - Time domain specifications	Determine the time response of 2nd order system and Calculate transient and steady state time period of a system
L19	Transient response of second order systems - Time domain specifications	Determine the time response of 2nd order system and Calculate transient and steady state time period of a system
L20	Steady state response - Steady state errors and error constants	Compute the steady state error and error constants
L21	Steady state response - Steady state errors and error constants	Compute the steady state error and error constants
L22	Effects of proportional derivative, proportional integral systems	Analyze the controllers of P, PI, PD and PID
L23	<b>UNIT-III</b> The concept of stability and qualitative stability and conditional stability	Define the stability of system and discuss the different types of stabilities.
L24	Routh stability criterion	Find the stability of system with Routh stability criterion
L25	Routh stability criterion	Find the stability of system with Routh stability criterion
L26	Routh stability criterion	Find the stability of system with Routh stability criterion
L27	Routh stability criterion	Find the stability of system with Routh stability criterion
L28	Routh stability criterion	Find the stability of system with Routh stability criterion
L29	Concept of Root locus and problems on Root locus	Find the stability with root locus technique of a control system
L30	Concept of Root locus	Find the stability with root locus technique of a control system
L31	Problems on Root locus	Find the stability with root locus technique of a control system
L32	Problems on Root locus	Find the stability with root locus technique of a control system
L33	Problems on Root locus	Find the stability with root locus technique of a control system
L34	Problems on Root locus	Find the stability with root locus technique of a control system
L35	Problems on Root locus	Find the stability with root locus technique of a control system
<b>Mid Examination I</b>		
L36	Introduction to Frequency response analysis and Determination of Frequency domain specifications	Outline the importance of Frequency response analysis for determining the frequency domain specifications
L37	Determination of Frequency domain specifications	Compute frequency domain specifications
L38	Bode diagrams - transfer function from the Bode Diagram- Phase margin and	Draw the Bode Plot and compute Gain margin & phase margin from a Bode Plot

Lecture no.	Topic to be covered	Topic outcome
<i>At the end of the class, student will be able to</i>		
	Gain margin	and Stability of system
L39	Bode diagrams - transfer function from the Bode Diagram- Phase margin and Gain margin	Draw the Bode Plot and compute Gain margin & phase margin from a Bode Plot and Stability of system
L40	Bode diagrams - transfer function from the Bode Diagram- Phase margin and Gain margin	Draw the Bode Plot and compute Gain margin & phase margin from a Bode Plot and Stability of system
L41	Bode diagrams - transfer function from the Bode Diagram- Phase margin and Gain margin	Draw the Bode Plot and compute Gain margin & phase margin from a Bode Plot and Stability of system
L42	Bode diagrams - transfer function from the Bode Diagram- Phase margin and Gain margin	Draw the Bode Plot and compute Gain margin & phase margin from a Bode Plot and Stability of system
L43	Bode diagrams - transfer function from the Bode Diagram- Phase margin and Gain margin	Draw the Bode Plot and compute Gain margin & phase margin from a Bode Plot and Stability of system
L44	<b>UNIT-IV</b> Polar Plot	Compute stability by using the polar plot
L45	Nyquist plot	Compute stability by using the Nyquist plot
L46	Nyquist plot	Compute stability by using the Nyquist plot
L47	Nyquist plot	Compute stability by using the Nyquist plot
L48	Nyquist plot	Compute stability by using the Nyquist plot
L49	Nyquist plot	Compute stability by using the Nyquist plot
L50	Lag, Lead and Lead-Lag compensators	Classify the different types of compensators
L51	PID controllers	Explain PID controllers
L52	<b>UNIT-V</b> Concepts of state, state variables and state model	Define state, state variables and state model
L53	Derivations of state models from block diagrams	Derive the state model by using block diagram
L54	Derivations of state models from block diagrams	Derive the state model by using block diagram
L55	Diagonalization-	Solve the Time invariant state Equations
L56	State Transition Matrix	Derive STM
L57	State Transition Matrix and its Properties	List the properties of STM
L58	State Transition Matrix and its Properties	List the properties of STM
L59	Concept of Controllability	Test the controllability of different systems
L60	Concept of Observability and Duality	Test the Observability and Duality of different systems
<b>Mid Examination II</b>		

**TEXT BOOKS:**

1. "I. J. Nagrath and M. Gopal", "Control Systems Engineering", New Age International (P) Limited, Publishers, 5<sup>th</sup> edition, 2009
2. "B. C. Kuo", "Automatic Control Systems", John Wiley and sons, 8th edition, 2003.

**REFERENCE BOOKS:**

1. "N. K. Sinha", "Control Systems", New Age International (P) Limited Publishers, 3<sup>rd</sup> Edition, 1998.
2. "NISE", "Control Systems Engineering", John Wiley, 6<sup>th</sup> Edition, 2011.
3. "Katsuhiko Ogata", "Modern Control Engineering", Prentice Hall of India Pvt. Ltd., 3<sup>rd</sup> edition, 1998.

**Activities in the class:**

- ✓ After completion of every class every student has to brief about the topic.
- ✓ After completion of every unit, student has to give seminar one topic from that unit.
- ✓ For every unit, multiple choice questions/fill in the blank questions is discussed.

**Grading:**

- ✓ Quizzes, examinations, home work, class participation, Project based assignments and presentations

**EVALUATION SCHEME:**

✓ Internal Assessment (sum of scores obtained in two tests)	- 20
✓ Assignments	- 5
✓ End Semester Examination	- 75
<b>Total</b>	<b>- 100</b>

**Subject** : Gender Sensitization  
**Name of the faculty** : Babu Rao  
**No of contact hours/week** : 3

**Course Overview:**

Gender sensitization refers to the modification of behavior by raising awareness of gender equality concerns. It is interlinked with gender empowerment. Gender sensitization theories claim that modification of the behavior of teachers and parents towards students. Gender sensitizing is about changing behavior and instilling empathy into the views that we hold about our own and the other gender. It helps people in "examining their personal attitudes and beliefs and questioning the 'realities' they thought they know. In view of the increasing role of women in public life and the efforts of the government in the direction of universalisation of education, the question of gender sensitization has assumed greater importance.

Reports of gender discrimination, sexual harassment, and other forms of sexually objectionable behavior are quite common in Indian educational institutions. Numerous reasons can be forwarded behind such behavior. Gender discrimination cannot be treated in isolation as it has its roots in deeper problems, which plague our society.

The students are going to study this discrimination at home weakens the personality of women in general and they look upon themselves as inferior to men right from childhood. At the same time, students are made to believe that they are inherently superior to females. The indoctrination received at home compounded by the already existing social differentiation between males and females give rise to attitudes in the male folk, which are far from egalitarian.

Test portion	
Test No.	Topics
1	L1-L22
2	L23-L41
Assignment portion	
Assignment No.	Topics
1	L1-L22
2	L23-L41

Submitted by	Approved by
(Signature of the faculty) Date:	(Signature of HOD) Date:

**Course Objectives:**

At the end of this course, the student will be able to:

- Develop their sensibility with regards to issues of gender in contemporary India.
- Provide a critical perspective on the socialization of men and women.
- Introduce students to inform about some key biological aspects of genders.
- Expose the students to debates on the politics and economics of work.
- Help the students reflect critically on gender violence.
- Expose students to more egalitarian interactions between men and women.

## Course Outcomes:

At the end of this course the students:

- Develop a better understanding of important issues related to gender in contemporary India.
- Sensitize to basic dimensions of the biological, sociological, psychological and legal aspects of gender. This will be achieved through discussion materials derived from research, facts, everyday life, literature and films.
- Acquire insight into the gendered division of labor and its relation to politics and economics.
- Equip to work and live together as equals.
- Develop a sense of appreciation of women in all walks of life.
- Provide accounts of studies and movements as well as the new laws that provide and relief to women, the text book will empower students to understand and respond to gender violence.

Lecture No.	Topic to be covered	Topic Outcome
<i>At the end of the topic, the student will be able to:</i>		
L1	<b>Unit-I-(Understanding Gender)</b> <b>Introduction to the subject</b>	Recognize the importance of the subject
L2	Definition and meaning of Gender and Why should we study	Identifies the importance and study about the subject
L3-L4	Meaning and Definition about Socialization with examples	Analyze the importance of the socialization
L5-L6	Preparing for womanhood. Growing up male	Identifies the differences between the making men and making women
L7	Relationships and Different Masculinities	Identify the importance of the relationships and analyzes.
L8-L10	Being together as equals	Describe the importance of the different types of the relationships along with groups / group discussion
L11	<b>UNIT-II (Gender and Biology):</b> Definition and Meaning about Gender and Biology; Missing women	Analyze the importance about the topic
L12	Sex selection and its consequences	Recognize the importance and realize about its consequences
L13-L15	Declining Sex ratio: Demographic Consequences	Identifies the importance about Sex ratio in the society
L16-L17	Gender Spectrum: Beyond the Binary	Discuss the importance about the topic and analyze its consequences
L18-L19	Two or Many? (Our body, Our health)	Explains the importance about health
L20	<b>UNIT-III (Gender and Labor)</b> Meaning and Definition	Explains the different types of definitions
L21	Housework : The invisible Labor	Identify the importance about the labor
L22	My mother doesn't work, share the load	Identify the importance of the work at the home and realizes to work at the home by sharing the work load
<b>I MID EXAMINATION</b>		
L23-L25	Women's work: Its politics and Economics	Recognize the importance about the women empowerment in the society
L26-L27	Fact and Fiction: Unrecognized and Unaccounted work	Determine the relationship between the fact and fiction and analyses its importance with examples
L28	<b>UNIT IV -(Issues of Violence)</b> Meaning and Definition	Explains the different types of definitions about Issues of Violence
L29-L30	Sexual Harassment: Say NO! Various types of harassments	Recognizes about harassment and realizes its consequences in the society
L31-L32	Domestic Violence: Speaking Out	Explains about domestic violence and discusses about Human Rights.
L33	Is home a safe place?	Recognize the importance of the home

Lecture No.	Topic to be covered	Topic Outcome
L34-L35	About sexual Violence	Explains about various types of violence
L36	<b>UNIT –V (Gender Studies)</b> Meaning and Definition	Explains the different types of definitions about Gender Studies
L37-L38	Knowledge: Through the lens of Gender and the structure of the knowledge	Applies the Knowledge towards the subject and describes various types of structures
L39-L41	History about writers: Reclaiming a Past and Writing other histories	Recognizes the importance of the Historians by reading their articles and books and discussion.
L42	Revision	UNIT –I
L43	Revision	UNIT –II
L44	Revision	UNIT-III
L45	Revision	UNIT -IV
L-46	Revision	UNIT-V
<b>II MID EXAMINATION</b>		

### Text Books (Essential Reading):

1. Towards a World of Equals: A Bilingual Text Book on Gender written by A. Suneetha, Uma Brugubanda, Duggirala Vasantha, Rama Melkote, Vasudha Nagaraj, Asma Rasheed, Gogu Shyamala, Deepa Srinivas and Susie Network Analysis and synthesis- Umesh Sinha – Satya Prakashan Publications.

### Reference Books:

1. Sen, Amartya "More than one million women are missing". New York review of books 37.20 (20 December 1990) Print' we were making History...'Life stories of women in Telangana People's Struggle. New Delhi : Kali for women , 1989
2. Tripti Lahiri. "By the number: Where Indian women work." Women's studies journal (14<sup>th</sup> November 2012).
3. K. Sathynanarayana and Susie Tharu (Ed) Steel nibs are sprouting: New Dalith Writing from South India, Dossier 2: Telugu and Kannada.
4. Stree Shakthi Sanghatana. "We were making History", Life Stories of Women in the Telangana People's Struggle, New Delhi: Kali for women, 1989.
5. Jegannathan Pradeep, Partha Chatterjee (Ed). "Community, Gender and Violence Subaltren Studies XI", Permananr Black and Ravi Dayal publishers, New Delhi 2000.
6. Virginia Woolf, A Room of One's Own Oxford; Black swan, 1992.
7. K. Kapadia. The Violence of Development: The Politics of Identity, Gender and Social Inequalities in India. London: Zed Books, 1992.
8. S. Benhabib. Situating the Self: Gender, Community, and Post Modernism in Contemporary Ethics, London: Rout Ledge 1992.

### Activities in the class:

- One Minute paper in every lecture
- Seminars by Students after completion of every unit
- Think-Pair-Share activity is conducted at least once in a week
- Quiz related to specific topic is conducted twice in a semester
- Note check is performed whenever necessary

### Assessment / Evaluation Methods:

Final Examination	:	<b>75</b>
<b>Total Marks</b>	:	<b>75</b>

### Ground Rules:

- Attendance should be regular
- Avoid cell phones in the class room as well as in the examination hall
- Copying of the assignments is strictly prohibited according to plagiarism.
- Punctuality and Discipline is must in the class.
- Assignment marks can be written or activity. Hence presence is must.

\*\*\* All the Best \*\*\*

### **IV Year EEE**

## **About Aristotle Educational Society**

Aristotle Educational Society was established in 2000, with an aim of bringing quality Engineering and management education closer to the student's populace at large. The society is founded by experienced and visionary team of academicians, industrialists and NRI Entrepreneurs, whose valuable knowledge and experience are the guiding factors for K G Reddy College of Engineering & Technology (KGR CET). At KGR CET we are always for every driving improvements and innovation in education, is it infrastructure expansion or faculty talent acquisition. Our endeavor is to provide best of the class facilities and services to our students.

Twenty First Century society is considered to be a knowledge society. But many of our educationists and captains of industry are of the opinion that there is a significant mismatch between the kind of education students are equipped with from our institutions and the industry's expectations. It is precisely to bring down this gap that our focus is on continuous enhancement of both the technical skills as well as the soft skill of our students in order to compete and succeed in the global work places of tomorrow.

### ***Vision:***

To be recognized as a reputable engineering college imparting value-based technical education by means of advanced curriculum, effective teaching methodologies and renewed research-oriented and entrepreneurial focus in order to introduce new-age, industry-driven engineers dedicated to lead the society.

### ***Mission:***

- To offer career-guided technical education with continued focus on application of acquired knowledge and skills.
- To provide a scholarly learning environment for students and faculty enabling them to achieve personal and professional growth.
- To engage in intensive research and entrepreneurial development and thereby, contribute to the upcoming engineering challenges in the world.

## **Ten Rules to Transform Yourself into an Ideal Student and a Perfect Professional**

11. The first thing is punctuality. You are expected to be in your seat in the classroom by 9:00 am. However, 10 minutes of grace time is given to enter the class. If you arrive at the institute after 9:10 am and before 09:50 am you can attend the rest of the classes. From 10:00 am, no student will be allowed to gain entry into the campus. You are not permitted to enter the class after the commencement of the class (except 1<sup>st</sup> period) and should not leave a class before that class ends.
12. You should not leave the campus during the working hours (between 9:00 am and 3:45 pm) without prior permission from the principal. Students' who wishes to leave the campus for any reason may apply for permission to the concerned Head who in turn forward the case to the Principal. The Principal may issue the Gate pass after getting the consent of the parent.
13. You must wear neat and clean formal dress. Your attire should be befitting to the status of a student

- doing a professional course. You must wear (display) the Identity Card as long as you are in the campus.
14. Use of mobile phones is strictly prohibited in the class rooms/ labs/ workshops/ library/computer labs/Offices and other prominent places.
  15. All the interpersonal communication within the campus must be only in English. If mistakes, fear/tension, mother tongue influence etc. are your reasons for not speaking in English, you must realize that they are all part and parcel of the learning process. Unless you make mistakes and learn from your mistakes you will never be able to acquire good command over English. As you are all aware, good command over English paves the way for a good professional career.
  16. In case there is any delay on the part of any teacher in entering your class, and as a result the students are idle, one of the students from your class (preferably CR) may contact the HOD/Academic Counselor for corrective measures/necessary arrangements. You should not be seen in corridors, canteen, and buses or anywhere outside your classroom/lab without carrying a permission letter. If you do not have any teaching hours you are advised to make use of your free time productively, by utilizing various facilities provided by the college like; Library, Digital Library, Language Lab, Sports Lounge etc. and widen your horizons.
  17. You must actively participate in all academic and extracurricular activities like; Seminars/Workshops, Tech Fests, College Day and all the National Festivals and use them as a platform to present yourself and grow as a better individual.
  18. As a student, you are expected to cultivate habits like practicing self discipline, showing dedication towards your studies and respecting the teachers and elders.
  19. If any one of you has any complaints or grievances against the institution, you are always welcome to bring them to the notice of your respective departments and get your problems solved.
  20. Never forget that you are always welcome to make your suggestions for the improvement of the institution. Your suggestions will be appreciated and implemented if they found to be good, innovative and helpful to us in offering better services to all of you.

## **Academic Regulations**

### **1. Holidays**

KGR CET strictly follows the holidays notified by JNTUH Academic calendar.

### **2. Attendance**

e) A student shall be eligible to appear for University Examinations, if he/she possesses an aggregate of at least of 75% of attendance in all the subjects.

f) A student will not be promoted to the next semester unless he/she satisfies the attendance requirement of the present semester / 1<sup>st</sup> year.

g) If any student wants to go on leave for three or four days, the parents should meet the academic Counselor of the class, to which the student belongs to, to get the permission.

h) Attendance is compulsory on the preceding and the proceeding days of any holiday.

### **3. Credit System**

The credit system is as per the JNTUH Course Structure and syllabus. Students can have the details by going through the syllabus books.

### **4. Distribution and weight age of marks:**

The performance of a student in each semester / 1 year shall be evaluated subject wise with a maximum of 100 marks for theory and 75 marks for practical subject.

<b>Subject</b>	<b>Internal Exam</b>	<b>Assignments</b>	<b>End semester Exam</b>	<b>Total Marks</b>
<b>Theory</b>	20	5	75	100
<b>Practical</b>	25	-	50	75

After a student has satisfied the requirements prescribed for the completion of the program and is eligible for the award of B. Tech. Degree he shall placed in one of the following 4 Classes:



Class Awarded	% of marks to be secured	
First class with Distinction	70 % and above	From the aggregate marks secured from the best 196 credits
First Class	Below 70% but not less than 60%	
Second Class	Below 60% but not less than 50%	
Pass Class	Below 50% but not less than 40%	

For further details on academic regulations, please refer the syllabus books.

## General Information

### Communication

In case any student or parent wants to contact the college authorities and put forward their views should communicate the same to the Head of the department/ Principal. Any change of address, the parents have to report it to the academic counselor concerned either personally or by making a phone call.

### Ragging

Ragging is strictly prohibited, on the campus and there is an anti ragging squad working in the college premises and if any senior students are observed troubling the fresher's stringent action will be taken against the culprits and there should be no doubt in any body's mind about the commitment of the college authorities to crush the ragging with an iron hand.

### Library (Rules and Regulations)

The college has a spacious and well-stocked library with text books and reference books and several national and international journals and magazines. The stockpile of the books goes on increasing year after year to help students keep abreast of the latest information. All the students are advised to put the library to the optimum utilization and try to widen your knowledge. The Digital library is equipped with 14000+ on line E journals.

Titles	:	2920
Volume of books	:	22174
Print Journals	:	105
E-Journals	:	DELNET, IEEE, etc.
Seating Capacity	:	150
Timings	:	8 AM – 6 PM
Digital Library	:	30 systems, High speed Internet, 14000+ online journals

## II Semester

Description	Existing Period	Duration
Commencement of class work	07.12.2017	-
First mid examinations Timings 10.00 am to 12.00 Noon (Forenoon Session) 02.00 pm to 4.00 pm (After Noon Session)	07.02.2018 to 09.02.2018	(3 days)
Submission of first midterm exam marks to University on or before	17.02.2018	-

<b>Description</b>	<b>Existing Period</b>	<b>Duration</b>
Parent Teacher Meeting	10.03.2018	-
Last day of instruction	03.04.2018	
Second mid Examinations Timings 10.00 am to 12.00 Noon (Forenoon Session) 02.00 pm to 4.00 pm (AN)	04.04.2018 to 07.04.2018	(1 week)
Submission of second midterm exam marks to University on or before	17.02.2018	-
Preparation holidays and practical examinations	09.04.2018 to 14.04.2018	(1 week)
End Semester Examinations	16.04.2018 to 07.05.2018	
Summer Vacation	16.05.2018 to 11.06.2018	

## About the Department

Electrical and Electronics Engineering Department, established in the year 2008, is one of the oldest departments of K G Reddy College of Engineering and Technology. The Primary objective of the department is to impart quality education and training at the undergraduate level in the areas of Electrical and Electronics Engineering.

The Department has qualified and experienced faculty in all the related fields of Electrical and Electronics Engineering. The theoretical knowledge is further supplemented by well equipped laboratories. The department regularly organizes invited lectures by experts from industries in various fields of Electrical and Electronics Engineering. Workshops and Industrial visits are regularly conducted under the association of Electro Technia Association for Empowering (EAE).

The department is headed by **Mr. Khamruddin Syed, Associate Professor**, who is having vast academic and research experience. Students are encouraged to participate in various Workshops, Seminars, Conferences and technical competitions at various levels.

### ***Vision:***

- To become a renowned department imparting both technical and non-technical skills to the students by implementing new engineering pedagogy's and research to produce competent new age electrical engineers.

### ***Mission:***

- To transform the students into motivated and knowledgeable new age electrical engineers.
- To advance the quality of education to produce world class technocrats with an ability to adapt to the academically challenging environment.
- To provide a progressive environment for learning through organized teaching methodologies, contemporary curriculum and research in the thrust areas of electrical engineering.

### **Contact Details of the Faculty:**

Sl. No.	Name of the Faculty	Name of the Subject	Mobile	E-mail Id
1	K. Hussain (HOD)		7660000962	hod.eee@kgr.ac.in
2	G. Anjaneyulu	HVDC and FACTS devices	9533696589	<a href="mailto:anjaneyulu.gundeti@gmail.com">anjaneyulu.gundeti@gmail.com</a>
3	M.Prasanna Kumari	Renewable Energy Sources	9618993753	prasanna23m@gmail.com
4	Shailaja	Advanced Control Systems	8096766126	shailuvasankiee@gmail.com
5	Khamruddin Syed	Seminar	9848606081	<a href="mailto:hod.eee@kgr.ac.in">hod.eee@kgr.ac.in</a>
6	G. Anjaneyulu	Major Project	9533696589	<a href="mailto:anjaneyulu.gundeti@gmail.com">anjaneyulu.gundeti@gmail.com</a>
7	Khamruddin Syed	Seminar	9848606081	<a href="mailto:hod.eee@kgr.ac.in">hod.eee@kgr.ac.in</a>

### **Mentor Details:**

S. No.	Name of the Mentor	Mobile	Mentees Roll No.
1	M.Mahesh Kumar	9885856164	14QM1A0201-207
2	G. Anjaneyulu	9533696589	15QM5A0201-209

**Class In-charges:**

S. No.	Name of the Class In-charge	Mobile	E-mail Id
1	G. Anjaneyulu	9533696589	<a href="mailto:anjaneyulu.gundeti@gmail.com">anjaneyulu.gundeti@gmail.com</a>

**Class Representative Details:**

S. No.	Name of the CR	Roll No.	Mobile
1	Nagamuni	14QM1A0205	7330676338

**COURSE DESCRIPTION DOCUMENTS**

**Subject** : Fundamentals of HVDC and FACTS Devices  
**Subject Code** : A80237  
**Name of the faculty** : G. Anjaneyulu  
**No. of contact hours/week** : 5

**Course Overview:**

This subject deals with the importance of HVDC transmission, analysis of HVDC converters, faults and protections, harmonics and filters. It also deals with reactive power control and power factor improvements of the system.

Test Portion	
Test No.	Topics
1	L1-L34
2	L35-L67
Assignment Portion	
Assignment No.	Topics
1	L1-L34
2	L35-L67

<b>Submitted by</b>	<b>Approved by</b>
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(Signature of the faculty) Date:	(Signature of HOD) Date:
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Lecture no	Topic to be covered	Topic outcome
<b><u>UNIT-I</u></b>		

**Course Objectives:**

At the end of this course, the student will be able to:

- Identify the requirements of DC transmission

system.

- Analyze the pulse converters and HVDC control systems.
- Determine the reactive power control in HVDC.
- Knowledge on power flow analysis in AC and DC systems.
- Identify the faults and protection against over voltages and currents.
- Recognize the filters for different harmonics.

**Course Outcomes:**

At the end of this course the student should be able to:

1. Identify the requirements of DC transmission system.
2. Analyze the characteristics of pulse converters and different control systems.
3. Determine the reactive power control in HVDC.
4. Explain the AC and DC power flow.
5. Recognize the faults by providing proper protection.
6. Choose the filters for different harmonics.

*At the end of the topic, the student will be able to*

L1	Introduction on HVDC and HVAC systems	Identify the applications and Outcomes
L2	<b>UNIT-I</b> Comparison of AC and DC transmission systems	Compare AC and DC transmission
L3	Application of DC transmission	Recognize application of dc transmission system
L4	Types of DC links	Classify types of HVDC links
L5	Typical layout of a HVDC converter station	Identify typical layout of a HVDC converter station
L6	HVDC converters	Analyze the HVDC converters
L7	Pulse number	Plan and design pulse number
L8	Analysis of Gratez circuit with overlap	Analyze graetz analysis
L9	Analysis of Gratez circuit without overlap	Analyze gratez circuit without overlap
L10	Converter bridge characteristics	Determine the converter bridge characteristics
L11	Equivalent circuits or rectifier	Draw the equivalent circuits or rectifier
L12	Inverter configurations of twelve pulse converters.	Explain the inverter configurations of twelve pulse converters.
L13	Revision	Recollect the HVDC introduction
<b><u>UNIT-II</u></b>		
L14	Introduction to converter & HVDC System Control	Estimate the converter & HVDC System Control
L15	Principles of DC Link Control	Apply the principles of DC Link Control
L16	Converters Control Characteristics	Draw the converters Control Characteristics
L17	System control hierarchy	Use the system control hierarchy
L18	Firing angle control	Use the firing angle control
L19	Current control	Control the converter current
L20	Extinction angle control	Control the extinction angle in converters
L21	Revision	Recollect the converter & HVDC System Control
L22	Starting and stopping of DC link	Operate the starting and stopping of DC link
L23	Test	Asses the Test
L24	Revision	Summarize the converter & HVDC system Control
<b><u>UNIT-III</u></b>		
L25	Introduction Harmonics, Filters and Reactive Power Control	Memorize the concepts of Harmonics, Filters and Reactive Power Control

L26	Generation of harmonics	Identify the generation of harmonics
L27	AC and DC filters	Compare the AC and DC filters
L28	Reactive Power Requirements in steady state	Recognize the Reactive Power Requirements in steady state
L29	Sources of reactive power	Select the sources of reactive power
L30	Static VAR systems.	Identify the static VAR systems.
L31	Modelling of DC/AC converters	Prepare the Modeling of DC/AC converters
L32	Controller Equations-Solutions of AC/DC load flow	Solve the controller Equations-Solutions of AC/DC load flow
L33	Simultaneous method-Sequential method	Compare the simultaneous method-sequential method
L34	Revision/Test	Recollect the Harmonics, Filters and Reactive Power Control
<b><u>UNIT-IV</u></b>		
L35	Introduction to FACTS	Define the FACTS
L36	Flow of power in AC parallel paths and meshed systems	Identify the flow of power in AC parallel paths and meshed systems
L37	Basic types of FACTS controllers	Classify the basic types of FACTS controllers
L38	Brief description and definitions of FACTS controllers	Describe the Brief description and definitions of FACTS controllers
L39	Brief description and definitions of FACTS controllers	Describe the Brief description and definitions of FACTS controllers
L40	Objectives of shunt compensation	Observe the objectives of shunt compensation
L41	Methods of controllable VAR generation	Apply the methods of controllable VAR generation
L42	Static VAR compensators	Recognize the static VAR compensators
L43	SVC	Select SVC
L44	STATCOM	Select STATCOM
L45	Comparison between SVC and STATCOM.	Compare the comparison between SVC and STATCOM.
<b><u>UNIT-V</u></b>		
L46	Introduction to Static Series compensators & combined compensators	Explain the static Series compensators & combined compensators

L47	Objectives of series compensation	Implement the objectives of series compensation
L48	Variable impedance type-thyristor switched series capacitors (TCSC)	Identify the variable impedance type-thyristor switched series capacitors (TCSC)
L49	Switching converter type series compensators	Recognize the switching converter type series compensators
L50	Static series synchronous compensator (SSSC)	Apply static series synchronous compensator (SSSC)
L51	Power angle characteristics-basic operating control schemes.	Draw the power angle characteristics-basic operating control schemes.
L52	Unified power flow controller	Observe the Unified power flow controller
L53	Basic operating principle	Apply the basic operating principle
L54	Independent real and reactive power flow controller	Control the independent real and reactive power flow controller
L55	Control structure.	Draw the control structure.
L56	revision	Recollect the static Series compensators & combined compensators

7.  
**Text Books:**  
 1. HVDC Power Transmission Systems: Technology And System Interactions by K. R. Padiyar, New Age International (P) Limited and Publishers.  
 2. EHVAC and HVDC Transmission Engineering

and Practice by S. Rao.

#### Reference Books:

1. HVDC Transmission by J. Arrillaga.
2. Direct Current Transmission by E. W. Kimbark, John Wiley & sons
3. Power Transmission by Direct Current by E. Uhulmann, B. S. Publications.

#### Activities in the class:

- One Minute paper in every lecture.
- Seminars by Students after completion of every unit.
- Think-Pair-Share activity is conducted at least once in a week.
- Quiz related to specific topic is conducted twice in a semester.
- Jigsaw activity is conducted once in a semester.
- Note check is performed whenever necessary.

#### Ground Rules:

- Attendance should be regular
- Avoid cell phones in the class room as well as in the examination hall.
- Copying of the assignments is strictly prohibited according to plagiarism.
- Punctuality and Discipline is must in the class.
- Assignment marks can be written or activity. Hence presence is must.



**Grading Criteria and Evaluation Scheme:**

Internal Exam I (10 Descriptive+ 10 Objective+ 5 Assignments)	:	<b>25</b>
Internal Exam II (10 Descriptive+ 10 Objective+ 5 Assignments)	:	<b>25</b>
Total internal Marks (Average of Internal Exam I and Internal Exam II)	:	<b>25</b>
University Exam Marks	:	<b>75</b>
<b>Total Marks</b>	:	<b>100</b>

**Subject** : RENEWABLE ENERGY SOURCES  
**Subject Code** : A80324  
**Name of the faculty** : M. Prasanna Kumari  
**No of contact hours/week** : 05

**Course overview:**

The course provides a study about the importance of non-conventional energy sources in upcoming centuries. The renewable energy sources course gives the complete information about how to collect the energy from renewable sources like solar, wind, bio-mass, geothermal, and ocean. It also gives the information regarding different types of parts which are required to produce the energy from non-conventional sources and its usage, applications. It also gives detailed information about energy conversion from one form to required form.

<b>Test portion</b>	
<b>Test no.</b>	<b>Topics</b>
<b>1</b>	<b>L1-L34</b>
<b>2</b>	<b>L35-L70</b>
<b>Assignment portion</b>	
<b>Assignment no.</b>	<b>Topics</b>
<b>1</b>	<b>L1-L34</b>
<b>2</b>	<b>L35-L70</b>

<b>Submitted by</b>	<b>Approved by</b>

(Signature of the Faculty)

Date:

(Signature of HOD)

Date:

### Course Objectives:

At the end of this course, the student will be able to:

- Study the principle of solar radiation
- Compare the different types of solar plates and storage techniques
- Explain the horizontal and vertical axis wind mills
- Describe the principle of bio-mass and characteristics of bio-mass
- Recognize the role of geothermal and ocean energies and their principles
- Discuss the importance of direct energy conversion and MHD generator

### Course Outcomes:

At the end of this course the student should be able to:

1. Explain the role of renewable sources and environmental impact on solar.
2. Differentiate the flat plate and concentrating collectors and recognize the solar energy storage in different methods.
3. Compare the horizontal and vertical axis in windmills.
4. Analyze the principle of bio conversion and characteristics of bio-mass.
5. Classify the types of geothermal and OTEC
6. Apply the knowledge on direct energy conversion and operation of MHD.

Lecture No.	Topic to be covered	Topic outcome
<b><i>At the end of the topic, the student will be able to</i></b>		
L1	Introduction to the course	Identify the applications and Outcomes
L2	<b>UNIT-I</b> Role and potential of new and renewable source	Explain the Role and potential of new and renewable source
L3-L4	The solar energy option	List The solar energy option
L5	Environmental impact of solar power physics of sun	Discuss the Environmental impact of solar power physics of sun
L6	The solar constant, extraterrestrial, terrestrial solar radiation	Demonstrate the solar constant, extraterrestrial, terrestrial solar radiation
L7	Solar radiation on titled surface	Analyze the Solar radiation on titled surface
L8	Instruments for measuring solar radiation	Classify the Instruments for measuring solar radiation
L9	Sun shine, solar radiation data	Explain Sun shine, solar radiation data
L10 L11	<b>UNIT-II</b> Flat plate and concentrating collectors	Define and explain Flat plate and concentrating collectors
L12 L13	Classification of concentrating collectors	Classify the concentrating collectors
L14 L15	Orientation and thermal analysis	Analyze Orientation and thermal analysis
L16	Advanced collectors	Discuss the Advanced collectors
L17	Revision	Recall and summarize L12-L15
L18 L19	Solar energy storage Different methods	Apply the Solar energy storage Different methods
L20	Sensible	Define a Sensible
L21	Latent heat storage	Explain Latent heat storage
L22	Stratified storage	Identify Stratified storage
L23	Solar ponds	List Solar ponds
L24 L26	Applications: solar heating techniques and cooling techniques	Explain solar heating techniques and cooling techniques

Lecture No.	Topic to be covered	Topic outcome
L25	Solar distillation and drying	
L26	Photovoltaic energy conversion	Distinguish Photovoltaic energy conversion
L27	<b>UNIT-III : Source and potentials</b>	Identify Source and potentials
L28 L29	Horizontal and vertical axis wind mills	Classify and explain Horizontal and vertical axis wind mills
L29-L30	Performance characteristics	Analyze the Performance characteristics
L31	Betz criteria	Apply Betz criteria
L32	Revision	Recall and summarize the topics from L1-L9
L33	Revision	Recall and summarize topics from L10-L18
L34	Revision	Recall and summarize topics from L19-L30
<b>I MID EXAMINATION</b>		
L35	Principles of bio-conversion	Explain the Principles of bio-conversion
L36	Anaerobic/aerobic digestion	Differentiate Anaerobic/aerobic digestion
L37-L38	Types of bio-gas digesters	Classify all types of bio-gas digesters
L39	Gas yield	Define Gas yield
L40 L41	Combustion characteristics of bio-gas	Explain Combustion characteristics of bio-gas
L42-L43	Utilization for cooking	Discuss the Utilization for cooking
L44	I.C. engine operation and economics aspects	Examine I.C. engine operation and economics aspects
L45	Economic aspects	Determine economic aspects
L46	<b>UNIT-IV : Resources</b>	Identify the resources
L47	Types of wells	Classify the Types of wells
L48-L49	Methods of harnessing the energy	Identify the Methods of harnessing the energy
L50-L51	Potential in India	Describe Potential in India
L52	OTEC, principles utilization	Define the OTEC, principles utilization
L53	Setting of OTEC plants	Locate the Setting of OTEC plants
L54	Thermodynamic cycles	Describe Thermodynamic cycles
L55	Tidal and wave energy : potential and conversion techniques	Explain the Tidal and wave energy : potential and conversion techniques
L56	Mini-hydel power plants and their economics	Determine the Mini-hydel power plants and their economics
L57	<b>UNIT-V</b> Need for DEC	Identify the Need for DEC
L58	Carnot cycles and its limitations	Explain the Carnot cycles and its limitations
L59	Principles of DEC	Define and explain the Principles of DEC
L60	Thermo electric generators and Seebeck	Describe the Thermo electric generators and Seebeck
L61 L62	Peltier and Joule-Thomson effects figure of merit and applications	Compare and analyze the Peltier and Joule-Thomson effects figure of merit and applications
L63 L64	MHD generators, principles and dissociation and ionization	Describe MHD generators, principles and dissociation an ionization d ionization
L65	<i>Hall Effect, magnetic flux</i>	<i>Define Hall Effect, magnetic flux</i>
L-66	MHD acceleration, MHD engine	Describe MHD acceleration, MHD engine
L-67	Power generation systems, electron dynamic conversion	Analyze Power generation systems, electron dynamic conversion
L-68	Economic aspects ,fuel cells	Determine Economic aspects ,fuel cells
L-69	Faraday's laws, thermodynamic aspects	Explain Faraday's laws, thermodynamic aspects
L-70	Selection of fuels	Choose the fuel
<b>II MID EXAMINATION</b>		

**Text Books:**

- Renewable energy resources/Tiwari and Ghosal/Narosa

**Reference Books:**

1. Renewable energy resources/Twidell & Weir
2. Solar energy /Sukhatme
3. Solar power engineering /B.S Magal Frank Kreith & John F Kreider

**Activities in the class:**

- One Minute paper in every lecture.
- Seminars by Students after completion of every unit.
- Think-Pair-Share activity is conducted at least once in a week.
- Quiz related to specific topic is conducted twice in a semester.
- Jigsaw activity is conducted once in a semester.
- Note check is performed whenever necessary.

**Ground Rules:**

- Attendance should be regular
- Avoid cell phones in the class room as well as in the examination hall.
- Copying of the assignments is strictly prohibited according to plagiarism.
- Punctuality and Discipline is must in the class.
- Assignment marks can be written or activity. Hence presence is must.

**Grading Criteria and Evaluation Scheme:**

Internal Exam I (10 Descriptive+ 10 Objective+ 5 Assignments)	:	<b>25</b>
Internal Exam II (10 Descriptive+ 10 Objective+ 5 Assignments)	:	<b>25</b>
Total internal Marks (Average of Internal Exam I and Internal Exam II)	:	<b>25</b>
University Exam Marks	:	<b>75</b>
<b>Total Marks</b>	:	<b>100</b>

**Subject** : Advanced Control Systems  
**Subject Code** : A80234  
**Name of the faculty** : Shailaja  
**No. of contact hours/week** : 5

**Course Overview:**

Advanced control systems deals with state space, describing function, phase plane and stability analysis including controllability and observability. It also deals with modern control and optimal control systems.

<b>Test Portion</b>	
Test No.	Topics
1	L1-L31
2	L31-L59
<b>Assignment Portion</b>	
Assignment No.	Topics
1	L1-L31
2	L31-L59

<b>Submitted by</b>	<b>Approved by</b>
(Signature of the faculty) Date:	(Signature of HOD) Date:

**Course Objectives:**

At the end of this course the student will be able to:

1. Analyze the basics of mathematical modeling.
2. Differentiate the stability analysis of linear and non linear systems.
3. Provide a theoretical basis for applying the methods of state space and Multivariable systems design.

**Course outcomes:**

S.No.	Topic	Scheduled date
	<b>UNIT-I</b>	
L1	introduction to the course(course overview)	Execute the course objectives, outcomes, assessment methods, grading policy and basic

Upon successful completion of this course the students should be able to:

1. Apply the modeling concepts.
2. Examine the stability analysis of linear and non linear systems.
3. Infer how the time responses of linear

time-invariant systems are linked to state space parameters.

4. Design basic control systems to achieve transient/steady state time response related performance goals.

		ground rules for the subject
L2	polar plots-Nyquist plots-stability analysis	Students are able to estimate and design the polar curves.
L3	practice problems on polar plots-Nyquist plots-stability analysis	Solve the practice problems on polar plots-Nyquist plots-stability analysis
L5	practice problems on polar plots-Nyquist plots-stability analysis	Students are able to estimate and design the polar plots-Nyquist curves.
<b>L6</b>	<b>LAG controller design in frequency domain</b>	Design the lag controller in frequency domain
L7	Practice problems on lag controller design in frequency domain.	Students are able to estimate and design the lag controller curves.
L8	Lead controller design in frequency domain.	Design the Lead controller in frequency domain
L9	Practice problems on lead controller design in frequency domain.	Students are able to estimate and design the lead controller curves.
L10	Lead-lag controller design in frequency domain.	Design the Lead-Lag controller in frequency domain
L11	Practice problems on lead-lag controller design in frequency domain.	Students are able to estimate and design the lead-lag controller curves.
	<b>UNIT-2</b>	
L12	Stability in the sense of Lyapunov's	Analyze stability in terms of Lyapunov
L13	Stability in the sense of Lyapunov's	Analyze stability in terms of Lyapunov
L14	Lyapunov's stability and Lyapunov's instability theorems	Investigate Lyapunov's stability and instability theorems.
L15	Lyapunov's stability and Lyapunov's instability theorems	Investigate Lyapunov's stability and instability theorems.
L16	practice problems	Solve the problems on instability theorems
L17	Direct method of Lyapunov for the linear continuous time autonomous systems	Evaluate the direct method for the linear continuous time autonomous systems.
L18	practice problems	Solve the problems on linear continuous time

		autonomous systems
L19	Direct method of Lynov for the non-linear continuous tie autonomous systems	Evaluate the direct method for the linear continuous time autonomous systems.
L20	practice problems	Solve the problems on linear continuous tie autonomous systems
L21	practice problems	Solve the problems on linear continuous tie autonomous systems
L22	Revision-1	Recollect And Summarize The Basics Of First 2 units
	<b>UNIT-3</b>	
L23	Introduction to phase-plane analysis	Examine the terms associated with phase plane analysis
L24	method of isoclines for Constructing Trajectories	Hypothesize the method for construction of trajectories.
L25	method of isoclines for Constructing Trajectories	Hypothesize the method for construction of trajectories.
L26	practice problems	Solve the practice problems on non linear control systems
L27	practice problems	Solve the practice problems on non linear control systems
L28	singular points	Identify what singular points mean.
L29	Phase-plane analysis of non linear control systems.	Demonstrate phase plane analysis of nonlinear control systems.
L30	Phase-plane analysis of non linear control systems.	Demonstrate phase plane analysis of nonlinear control systems.
L31	practice problems	Solve the practice problems on non linear control systems.
L32	REVISION	Recollect And Summarize The Basics Of First three Units
	<b>UNIT-4</b>	
L33	Introduction to nonlinear systems	



L34	types of non-linearities	Identify what types of nonlinearities
L35	types of non-linearities	Identify what types of nonlinearities
L36	Describing functions	Describe the basic functions
L37	Describing function analysis of nonlinear control systems.	Describe functional analysis of nonlinear systems
L38	Describing function analysis of nonlinear control systems.	Describe functional analysis of nonlinear systems
L39	Describing function analysis of nonlinear control systems.	Describe functional analysis of nonlinear systems
L40	practice problems	Solve the mathematical equations on nonlinear systems
L41	Revision	Recollect And Summarize The Basics Of First three units.
	<b>UNIT-5</b>	
L42	Concepts of state	Interpret state space analysis representation.
L43	state variables and state model	Analyze how to represent a state space variable
L44	state variables and state model	Analyze how to represent a state space variable
L55	Derivation of state model for block diagrams	Design the state model for block diagrams
L56	Derivation of state model for block diagrams	Design the state model for block diagrams
L57	Derivation of state model for block diagrams	Design the state model for block diagrams
L58	Diagonalization-Solving the Time invariant state	Solve the mathematical equations on Time invariant state
L59	Diagonalization-Solving the Time invariant state	Solve the mathematical equations on Time invariant state
L60	Diagonalization-Solving the Time invariant state	Solve the mathematical equations on Time invariant state
L61	Equations-State Transition Matrix and its	Develop and design a state transition matrix

	Properties		Referen ce
L62	Equations-State Transition Matrix and its Properties	Develop and design a state transition matrix	<b>Books:</b> 1. M odern Control System Theory- by M. Gopal, New Age Internati onal Publisher s, 2 <sup>nd</sup> Edition, 1996. 2. Modern Control Engineeri ng-by K. Ogata, Prentice
L63	Equations-State Transition Matrix and its Properties	Develop and design a state transition matrix	
L64	Concepts of Controllability and Observability.	Apply Jordan canonical form to obtain controllability and Observability.	
L65	Concepts of Controllability and Observability.	Apply Jordan canonical form to obtain controllability and Observability.	
L66	Concepts of Controllability and Observability.	Apply Jordan canonical form to obtain controllability and Observability.	
L67	Revision	Recollect And Summarize The Basics Of First Four Units	
L68	Revision	Recollect And Summarize The Basics Of First Four Units	
L69	Revision	Recollect And Summarize The Basics Of First Four Units	

Hall of India, 3<sup>rd</sup> Edition,  
1998.

#### Activities in the class:

- After completion of every class students should write summary of what has been said in the class.
- After completion of every unit a test will be conducted.
- For every two or three units a quiz pr presentation will be held.
- All the assessment, quiz and extra activities marks will be considered for the evaluation of the mid papers.

#### Grading:

- For presentations I will follow Rubrics based on interaction, body language, confidence level, audibility and knowledge.
- For quiz and key note points, one mark for the correct answers and will be considered for internal evaluation.

#### NOTE:

- Assignments should be submitted on time.
- Accessing mobiles during class hours is not permitted.

#### EVALUATION SCHEME:

Internal Exam I (10 Descriptive+ 10 Objective+ 5 Assignments)	:	25
Internal Exam II	:	25

(10 Descriptive+ 10 Objective+ 5 Assignments)

Total internal Marks	:	<b>25</b>
(Average of Internal Exam I and Internal Exam II)		
University Exam Marks	:	<b>75</b>
<b>Total Marks</b>	:	<b>100</b>

\*\*\* All the Best \*\*\*