

II B.Tech. - II Semester

S.No.	Course Code	Category of course	Subjects	L	T	P	C
1	23HM4T03	HSMC	Managerial Economics & Financial Analysis	2	0	0	2
2	23ES4T13	ES	Analog Circuits	3	0	0	3
3	23EE4T05	PC	Power Systems-I	3	0	0	3
4	23EE4T06	PC	Induction and Synchronous Machines	3	0	0	3
5	23EE4T07	PC	Control Systems	3	0	0	3
6	23EE4L05	PC	Induction and Synchronous Machines Lab	0	0	3	1.5
7	23EE4L06	PC	Control Systems Lab	0	0	3	1.5
8	23CS4S04	SEC	Python Programming Lab	0	1	2	2
9	23ES4L06	ES	Design Thinking & Innovation	1	0	2	2
Total				15	1	10	21
23BS5T01 Mandatory Community Service Project of 08 Weeks duration during summer Vacation							

S.No.	Members	Name & Institution	Signature of member
1	Chairman	Dr. S.Srikanth , Professor & HOD	
2	University Nominee	Dr.N.Sumathi Associate Professor, Dept. of EEE,UCEK, JNTUK Kakinada	
3	Subject expert from outside the college	Dr. K.Siva Kumar , Professor, Dept. of EE, IIT Hyderabad	
4	Subject expert from outside the college	Dr. G.Siva Kumar , Asst. professor , Dept. of EE, NIT Warangal	
5	Representative from Industry	Dr.S.Jayadeep Product Development Engineer, Digital Energy Solutions Larsen&Toubro,Pune	
6	Alumni Member	D.Lakshman Kumar, Asst. professor, Dept. of EEE,Sri Vishnu Engineering College for Women(A), WG Dist.	

Associate Professor
Dept of Elec. & Electronics Engg.
University College of Engineering
J.N.T University Kakinada
KAKINADA-533 003

Department of Electrical and Electronics Engineering, Bonam Venkata Chalamayya Engineering College.

Year – II Semester	Code: 23HM4T03	L	T	P	C
		2	0	0	2

MANAGERIAL ECONOMICS AND FINANCIAL ANALYSIS

(Common to CE, EEE, ECE, CSE)

Course Objectives:

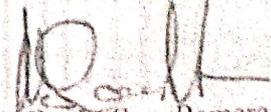
- To inculcate the basic knowledge of microeconomics and financial accounting
- To make the students learn how demand is estimated for different products, input-output relationship for optimizing production and cost
- To Know the Various types of market structure and pricing methods and strategy
- To give an overview on investment appraisal methods to promote the students to learn how to plan long-term investment decisions.
- To provide fundamental skills on accounting and to explain the process of preparing financial statements.

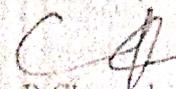
Course Outcomes: Students are able to

CO Number	Course Outcome	Blooms Level
CO1	Define the concepts related to Managerial Economics, financial accounting and management (L2)	BL2
CO2	Understand the fundamentals of Economics viz., Demand, Production, cost, revenue and markets (L2)	BL2
CO3	Apply the Concept of Production cost and revenues for effective Business decision (L3)	BL3
CO4	Analyze how to invest their capital and maximize returns (L4)	BL4
CO5	Evaluate the capital budgeting techniques. (L5)	BL5
CO6	Develop the accounting statements and evaluate the financial performance of business entity (L5)	BL5


A.D. Madhuri
(Chairman-BOS)


Dr. N. Uday Bhaskar
(University Nominee)


Dr. M. Sree Ramaraju
(Subject Expert)


Dr. B. Charwak
(Subject Expert)


Ms. V. P. S. L. Priyanka
(Member)

NIT - I Managerial Economics

Introduction - Nature, meaning, significance, functions, and advantages. Demand-Concept, Function, Law of Demand - Demand Elasticity- Types - Measurement. Demand Forecasting- Factors governing Forecasting, Methods.

NIT - II Production and Cost Analysis

Production - Nature, meaning, significance, functions and advantages. Production function- Least- cost combination- Short run and long run Production Function- Isoquants and Is costs, Cost & Break-Even Analysis - Cost concepts and Cost behaviour- Break-Even analysis (BEA) - Determination of Break-Even Point (Simple Problems).

NIT - III Business Organizations and Markets

Introduction - Forms of Business Organizations- Sole Proprietary - Partnership - Joint Stock Companies - Public Sector Enterprises. Types of Markets - Perfect and Imperfect Competition - Features of Perfect Competition Monopoly- Monopolistic Competition- Oligopoly-Price-Output Determination - Pricing Methods and Strategies

NIT - IV Capital Budgeting

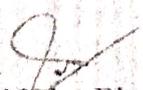
Introduction - Nature, meaning, significance. Types of Working Capital, Components, Sources of Short-term and Long-term Capital, Estimating Working capital requirements. Capital Budgeting- Features, Proposals, Methods and Evaluation. Projects - Pay Back

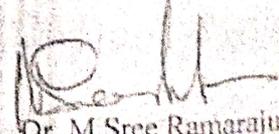
Method, Accounting Rate of Return (ARR) Net Present Value (NPV) Internal Rate Return (IRR) Method (simple problems)

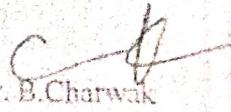
NIT - V Financial Accounting and Analysis

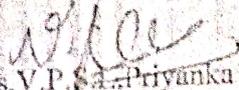
Introduction - Concepts and Conventions- Managerial Economics and Financial Accounting and Management.- Double-Entry Bookkeeping, Journal, Ledger, Trial Balance- Real Accounts (Trading Account, Profit and Loss Account and Balance Sheet with simple adjustments). Introduction to Financial Analysis - Analysis and Interpretation of Liquidity Ratios, Activity Ratios, and Capital structure Ratios and Profitability Ratios.


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(Subject Expert)


Dr. B. Charwak
(Subject Expert)


Ms. V.P. Sa. Priyanka
(Member)

Text Books:

1. Varshney & Maheswari: Managerial Economics, Sultan Chand.
2. Arvasri: Business Economics and Financial Analysis, 4/e, MGH.
3. D.M Mithani: Managerial Economics Himalaya Publishing House.

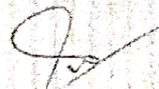
Reference Books:

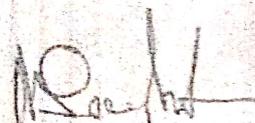
1. Abuja Hl Managerial economics Schand.
2. S.A. Siddiqui and A.S. Siddiqui: Managerial Economics and Financial Analysis, NewAge International.
3. Joseph G. Nellis and David Parker: Principles of Business Economics, Pearson, 2/e, New Delhi.
4. Donnick Salvatore: Managerial Economics in a Global Economy, Cengage.

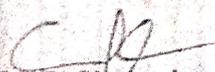
Online Learning Resources:

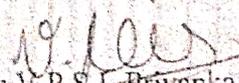
<https://www.slideshare.net/123ps/managerial-economics-ppt>
<https://www.slideshare.net/rossanz/production-and-cost-45827016>
<https://www.slideshare.net/darkyla/business-organizations-19917607> <https://www.slideshare.net/balarajbl/market-and-classification-of-market>
<https://www.slideshare.net/ruchi101/capital-budgeting-ppt-59565396> <https://www.slideshare.net/ashu1983/financial-accounting>


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Ms. V. P. S. E. Priyanka
(Member)



BONAM VENKATA CHALAMAYYA ENGINEERING COLLEGE (A)
ODALAREVU
DEPARTMENT OF ELECTRONICS AND COMMUNICATION ENGINEERING
B. TECH II YEAR SYLLABUS
BR23 REGULATIONS

II Year-II Semester					
23ES4T13	ANALOG CIRCUITS	L	T	P	C
		3	0	0	3

Pre-requisites: Knowledge of electronic components and semiconductor devices, number systems, binary arithmetic, Boolean or switching algebra, and logic gates.

Course Objectives:

- To acquire the basic knowledge on clippers, clampers & biasing circuits.
- To determine the h-parameters of a transistor circuit & understand the concepts of feedback amplifiers.
- To know the operation of oscillators and operational amplifier.
- To understand the applications of operational amplifier.
- To acquire the knowledge on IC 555
- To know the operation of Analog to Digital Converters and Digital to Analog Converters.

UNIT – I:

[8 Hrs]

Diode clipping and clamping circuits: Circuit and operation of Diode clippers and clampers.

DC biasing of BJTs: Load lines, Operating Point, Bias Stability, Collector to base bias, Self-Bias, Stabilization against Variations in V_{BE} and β for the Self-Bias Circuit, Bias Compensation on I_{CO} , Thermal Runaway.

Unit – II:

[12 Hrs]

Small Signals Modeling of BJT: Analysis of a Transistor Amplifier Circuit using h-

parameters, Simplified CE Hybrid Model, Analysis of CE, CC, CB Configuration using Approximate Model.

Feedback Amplifiers: Introduction, Block diagram of feedback amplifier, Classification of basic and Feedback Amplifiers. General Characteristics of Negative-Feedback Amplifiers, Effect of Negative Feedback on Output and Input Resistances of Voltage-Series Feedback, Current-Series Feedback, Current-Shunt Feedback, Voltage-Shunt Feedback.

Unit – III:

[10 Hrs]

Oscillator Circuits: Barkhausen Criterion of oscillation, Oscillator operation, R-C phase shift oscillator, Wien bridge Oscillator, Crystal Oscillator.

Operational Amplifiers: Introduction, Basic information of Op-Amp, Ideal Operational Amplifier, Block Diagram Representation of Typical Op-Amp, 741OP-Amp Ideal Characteristics and its features.

Unit – IV:

[10 Hrs]

OP-AMP Applications: Introduction, Basic Op-Amp Applications, Instrumentation Amplifier, AC Amplifier, V to I and I to V Converter, Sample and Hold Circuit, Multiplier and Divider, Ideal Differentiator and integrator.

Comparators and Waveform Generators: Introduction, Circuit and its operation of Comparator, Square Wave Generator, Monostable Multivibrator, Triangular Wave Generator, Sine Wave Generator.

<i>A. Praveen</i>	<i>U.V. Ratna Kumari</i>	<i>Dr. M. Rama Subba Reddy</i>			
Dr. A Pravin (Chairperson BOS) Professor & HOD Dept. of ECE,	Dr. U V Ratna Kumari Vice Principal-Academics UCEK, Kakinada, JNTUK, Vijayawada	Dr. M Rama Subba Reddy Professor, Dept of Applied Mechanics, IIT, Chennai	Dr. Narasimha Sarma N V S, Director, IIT, Tiruchirappalli.	Mr. S Bhavani Shankar Executive Manager, R&D Wing, Etlromes Systems Pvt. Ltd., Vijayawada	Dr. B. V. V. Satyanarayana Assoc. Prof. Dept. of ECE, VIT, Bhimavaram

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DEPARTMENT OF ELECTRONICS AND COMMUNICATION ENGINEERING
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BR23 REGULATIONS

Unit – V:

[10 Hrs]

Timers and Phase Locked Loop: Introduction to 555 timer, functional diagram, Monostable and Astable operations and applications, Schmitt Trigger, PLL block diagram, principles and description of individual blocks, 565 PLL, Applications of VCO (566).

Digital to Analog and Analog to Digital Converters: Introduction, basic DAC techniques, weighted resistor DAC, R-2R ladder DAC, inverted R-2R DAC, A-D Converters – parallel Comparator type ADC, counter type ADC, successive approximation ADC and dual slope ADC, DAC and ADC Specifications.

Textbooks:

1. Electronic Devices and Circuits- J. Millman, C. Halkias, Tata Mc-Graw Hill, 2nd Edition, 2010
2. Linear Integrated Circuits – D. Roy Choudhury, New Age International (p) Ltd, 2nd Edition, 2003.

Reference Books:

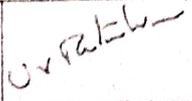
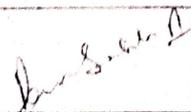
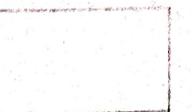
1. Electronic Devices and Circuit Theory – Robert L. Boylestad and Louis Nashelsky, Pearson Edition, 2021.
2. Electronic Devices and Circuits–G.K. Mithal, Khanna Publisher, 23rd Edition, 2017.
3. Electronic Devices and Circuits – David Bell, Oxford, 5th Edition, 2008.
4. Electronic Principles–Malvino, Albert Paul, and David J. Bates, McGraw-Hill/Higher Education, 2007.
5. Operational Amplifiers and Linear Integrated Circuits– Gayakwad R.A., Prentice Hall India, 2002.
6. Operational Amplifiers and Linear Integrated Circuits –Sanjay Sharma, Kataria & Sons, 2nd Edition, 2010.

Online Learning Resources:

- <https://nptel.ac.in/courses/122106025>.
- <https://nptel.ac.in/courses/108102112>.

Course Outcomes:

COs	Statements	BL
CO1	Analyze diode clipping and clamping circuits. Understand different types of biasing circuits of a transistor.	BL3
CO2	Use small signal modeling for transistor circuit analysis and illustrate the operation of feedback amplifiers	BL3
CO3	Understand operation of oscillators, operational amplifier and their applications.	BL2
CO4	Use 555 timers in multi-vibrators, Schmitt Trigger and PLL applications.	BL2
CO5	Describe the operation of different ADC's and DAC's.	BL2

 Dr. A Pravin (Chairperson BOS) Professor & HOD Dept. of ECE,	 Dr. U V Ratna Kumari Vice Principal-Academics UCLK, Kakinada, JNTUK, Kakinada	 Dr. M Rama Subba Reddy Professor, Dept of Applied Mechanics, IIT, Chennai	 Dr. Narasimha Sarma N V S, Director, IIT, Tiruchirappalli.	 Mr. S Bhavan Shankar Executive Manager, R&D Wing, Electronics Systems Pvt Ltd, Vijayawada	 Dr. B V V Satyanarayana Assoe. Prof, Dept of ECE, VIT, Bhubaneswar
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VICE-PRINCIPAL
University College of Engineering
JNTUK, KAKINADA



II B.Tech – II Semester

L	T	P	C
3	0	0	3

POWER SYSTEMS-I

(23EE4T05)

Course Objectives:

- To study principle of operation of different components of a hydro and thermal power stations.
- To study principle of operation of different components of a nuclear power stations.
- To study constructional and operation of different components of an Air and Gas Insulated substations.
- To study different types of cables and distribution systems.
- To study different types of load curves and tariffs applicable to consumers.

Unit I (BTL-2)**Hydroelectric Power Stations:**

Selection of site, general layout of a hydroelectric power plant with brief description of major components and principle of operation

Thermal Power Stations:

Selection of site, general layout of a thermal power plant. Brief description of components: boilers, super heaters, economizers and electrostatic precipitators, steam turbines: impulse and reaction turbines, condensers, feed water circuit, cooling towers and chimney.

Unit II (BTL-2)**Nuclear Power Stations:**

Location of nuclear power plant, working principle, nuclear fission, nuclear fuels, nuclear chain reaction, nuclear reactor components: moderators, control rods, reflectors and coolants, types of nuclear reactors and brief description of PWR, BWR and FBR. Radiation: radiation hazards and shielding, nuclear waste disposal.

Unit III (BTL-3)

Substations: Air Insulated Substations – indoor & outdoor substations, substations layouts of 33/11 kV showing the location of all the substation equipment. Bus bar arrangements in the sub-stations: simple arrangements like single bus bar, sectionalized single bus bar, double bus bar with one and two circuit breaker, main and transfer bus bar system with relevant diagrams.

Gas Insulated Substations (GIS): advantages of gas insulated substations, constructional aspects of GIS, comparison of air insulated substations and gas insulated substations.

Unit IV (BTL-3)**Underground Cables:**

Types of cables, construction, types of insulating materials, calculation of insulation resistance, stress in insulation and power factor of cable. Capacitance of single and 3-Core belted Cables. Grading of cables capacitance grading and intersheath grading.

UNIT V (BTL-4)

Economic Aspects & Tariff: Economic Aspects-load curve, load duration and integrated load duration curves, discussion on economic aspects: connected load, maximum demand, demand factor, loadfactor, diversity factor, plant capacity factor and plant use factor, base and peak load plants

Tariff Methods– Costs of generation and their division into fixed, semi-fixed and running costs, desirable characteristics of a tariff method, tariff methods: simple rate, flat rate, block-rate, two-part, three-part, and power factor tariff methods, Time of Day (ToD) tariff and Time of Use (ToU) tariff.

Department of Electrical and Electronics Engineering, Bonam Venkata Chalamayya Engineering College.

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KAKINADA-533 003

Text Books:

- 1.S. N. Singh, Electric Power Generation, Transmission and Distribution, PHI Learning Pvt Ltd, New Delhi, 2nd Edition, 2010
2. J.B.Gupta, Transmission and Distribution of Electrical Power, S.K.Kataria and sons, 10th Edition, 2012
3. V. K. Mehta and Rohit Mehta, Principles of Power System 4th Edition.

Reference Books:

1. I.J. Nagarath & D.P. Kothari, Power System Engineering, McGraw-Hill Education, 3rd Edition, 2019.
2. C.L.Wadhwa, Generation, Distribution and Utilization of Electrical Energy, New Age International Publishers, 6th Edition, 2018.
3. Turan Gonen, Electric Power Distribution System Engineering, McGraw-Hill, 1985.
4. Handbook of switchgear, BHEL, McGraw-Hill Education, 2007.

Online Learning Resources:

1. <https://nptel.ac.in/courses/108102047>

Course Outcomes:

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

CO1: Understand the different types of power plants, operation of power plants.

CO2: Understand the concepts of distribution systems, underground cables, economic aspects and tariff.

CO3: Understand various substations that are located in distribution systems.

CO4: Apply the above concepts to illustrate different power generation layouts

CO5: Analyze various economic aspects related to power generation and distribution.

S.No.	Members	Name & Institution	Signature of member
1	Chairman	Dr. S.Srikanth , Professor & HOD	
2	University Nominee	Dr,N.Sumathi Associate Professor, Dept. of EEE,UCEK, JNTUK Kakinada	
3	Subject expert from outside the college	Dr. K.Siva Kumar , Professor, Dept. of EE, IIT Hyderabad	
4	Subject expert from outside the college	Dr. G.Siva Kumar , Asst. professor , Dept. of EE, NIT Warangal	
5	Representative from Industry	Dr.S.Jayadeep Product Development Engineer, Digital Energy Solutions Larsen&Toubro,Pune	
6	Alumni Member	D.Lakshman Kumar, Asst. professor, Dept. of EEE,Sri Vishnu Engineering College for Women(A), WG Dist.	

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 University College of Engineering
 J.N.T University Kakinada
 Kakinada, Andhra Pradesh

Department of Electrical and Electronics Engineering, Bonam Venkata Chalamayya Engineering College.

II B.Tech – II semester

L	T	P	C
3	0	0	3

INDUCTION AND SYNCHRONOUS MACHINES (23EE4T06)

Pre-requisite: Principles of Electromechanical Energy Conversion, Electromagnetic fields and Electrical Circuit Analysis.

Course Objectives:

Students will get exposure to understand the concepts of

- Construction and operation of three-phase induction motor.
- Characteristics, starting and testing methods of Induction Motor.
- Torque production and performance of single phase Induction Motor.
- Determining the performance and working of synchronous generators.
- Construction and operation of three-phase synchronous motor.

UNIT-I:

Three-phase induction motors: (BTL-2)

Construction of Squirrel cage and Slip ring induction motors– production of rotating magnetic field – principle of operation – rotor EMF and rotor frequency – rotor current and power factor at standstill and during running conditions– rotor power input, rotor copper loss and mechanical power developed and their inter-relationship –equivalent circuit.

UNIT-II:

Performance of 3-Phase induction motors: (BTL-3)

Torque equation – expressions for maximum torque and starting torque torque-slip Characteristics –No load and Blocked rotor tests– circle diagram for predetermination of performance- methods of starting –starting current and torque calculations -speed control of induction motor with V/f control method and rotor Resistance control - induction generator operation.

UNIT – III:

Single Phase Motors: (BTL-2)

Single phase induction motors- Constructional features, double field revolving theory – equivalent circuit- starting methods of induction motors- capacitor start, capacitor start capacitor run induction motor, split phase motor - shaded pole motors, AC series motor.

UNIT-IV:

Synchronous Generator: (BTL-3)

Constructional features of non-salient and salient pole type alternators- armature windings – distributed and concentrated windings – distribution & pitch factors- E.M.F equation –voltage regulation by synchronous impedance method, MMF method and Potier triangle method-methods of synchronization- Slip test – Parallel operation of alternators.





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 Associate Professor
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UNIT-V:
Synchronous Motor: (BTL-3)

Synchronous motor principle and theory of operation – Effect of excitation on current and power factor– synchronous condenser –expression for power developed – hunting and its suppression – methods of starting.

Text Books:

1. Electrical Machinery, Dr. P.S. Bhimbra, Khanna Publishing, 2021, First Edition.
2. Performance and analysis of AC machines by M.G. Say, CBS, 2002.
3. Electrical machines by S.K.Sahdev Cambridge university press.

Reference Books:

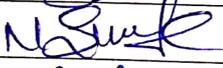
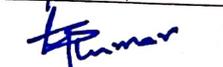
1. Electrical machines, D.P. Kothari and I.J. Nagrath, McGraw Hill Education, 2017, Fifth Edition.
2. Theory & Performance of Electrical Machines by J.B.Gupta, S.K.Kataria & Sons, 2007.
3. Electric Machinery, A.E.Fitzgerald, Charles kingsley, Stephen D.Umans, McGraw-Hill, 2020, Seventh edition.

Online Learning Resources:

1. nptel.ac.in/courses/108/105/108105131
2. <https://nptel.ac.in/courses/108106072>

Course Outcomes:

- At the end of the course, the student will be able to,
- CO1: Understand the construction and operation of three-phase induction motor.
- CO2: Analyze the performance of three-phase induction motor.
- CO3: Describe the working of various single-phase induction motors.
- CO4: Analyze the performance of Synchronous generators.
- CO5: Analyze the performance of Synchronous motors.

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5	Representative from Industry	Dr.S.Jayadeep Product Development Engineer, Digital Energy Solutions Larsen&Toubro,Pune	
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Department of Electrical and Electronics Engineering, Bonam Venkata Chalamayya Engineering College.

II B.Tech – II Semester

CONTROL SYSTEMS

(23EE4T07)

L	T	P	C
3	0	0	3

Pre-requisite: Basic Engineering Mathematics

Course Objectives:

- To obtain the mathematical models of physical systems and derive transfer function.
- To determine the time response of systems and analyse system stability.
- To analyse system stability using frequency response methods.
- To design compensators using Bode diagrams.
- To obtain the mathematical models of physical systems using state space approach and determine the response.

UNIT - 1

Mathematical Modelling Of Control Systems (BTL-2)

Classification of control systems - open-loop and closed loop control systems and their differences - transfer function of linear system, differential equations of electrical networks- translational and rotational mechanical systems. Transfer function of Armature voltage controlled DC servo motor Block diagram algebra –representation by signal flow graph – reduction using Mason's gain formula.

UNIT - 2

Time Response Analysis (BTL-3)

Standard test signals – time response of first and second order systems – time domain Specifications - steady state errors and error constants - effects of proportional (P) - proportional integral (PI) - proportional derivative (PD) proportional integral derivative (PID) systems.

Stability And Root Locus Technique

The concept of stability – Routh's stability criterion – limitations of Routh's stability, root locus concept – construction of root loci (simple problems)

UNIT - 3

Frequency Response Analysis (BTL-4)

Introduction to frequency domain specifications – Bode diagrams – stability analysis using Bode plots (phase margin and gain margin). Transfer function from the Bode diagram –Polar plots, Nyquist stability criterion.

UNIT - 4

Classical Control Design Techniques (BTL-5)

Lag, lead, lag-lead compensators - physical realization - design of lag, lead compensators using Bode plots.

UNIT - 5

State Space Analysis of LTI Systems (BTL-2)

Concepts of state - state variables and state model - state space representation of transfer function: Controllable Canonical Form - Observable Canonical Form, solving the time invariant state equations State Transition Matrix and its properties- concepts of controllability and observability.





Department of Electrical and Electronics Engineering, Bonam Venkata Chalamayya Engineering College.

Associate Professor
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 KAKINADA-533 023

Text Books:

1. Modern Control Engineering by Kotsuhiko Ogata, Prentice Hall of India, 2010.
2. Automatic control systems by Benjamin C.Kuo, Prentice Hall of India, 2nd Edition.
3. Control systems by Nagoor kani 3rd edition RBA Publications.

Reference Books:

1. Control Systems principles and design by M.Gopal, Tata Mc Graw Hill education Pvt Ltd., 4th Edition.
2. Control Systems Engineering by Norman S. Nise, Wiley Publications, 7th edition
3. Control Systems by Manik Dhanesh N, Cengage publications.
4. Control Systems Engineering by I.J.Nagarath and M.Gopal, NewagePublications, 5th Edition.

Online Learning Resources:

1. <https://archive.nptel.ac.in/courses/107/106/107106081/>
2. <https://archive.nptel.ac.in/courses/108/106/108106098/>
3. <https://nptelvideos.com/video.php?id=1423&c=14>

Course Outcomes:

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

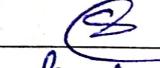
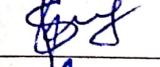
CO1: Derive the transfer function of physical systems and determine overall transfer function using block diagram algebra and signal flow graphs.

CO2: Obtain the time response of first and specifications of second order systems and determine error constants. Analyze the absolute and relative stability of LTI systems using Routh's stability criterion and root locus method.

CO3: Analyze the stability of LTI systems using frequency response methods.

CO4: Design Lag, Lead, Lag-Lead compensators to improve system performance using Bode Diagrams.

CO5: Apply state space analysis concepts to represent physical systems as state models, derive transfer function and determine the response. Understand the concepts of controllability and observability

S.No.	Members	Name & Institution	Signature of member
1	Chairman	Dr. S.Srikanth , Professor & HOD	
2	University Nominee	Dr,N.Sumathi Associate Professor, Dept. of EEE,UCEK, JNTUK Kakinada	
3	Subject expert from outside the college	Dr. K.Siva Kumar , Professor, Dept. of EE, IIT Hyderabad	
4	Subject expert from outside the college	Dr. G.Siva Kumar , Asst. professor , Dept. of EE, NIT Warangal	
5	Representative from Industry	Dr.S.Jayadeep Product Development Engineer, Digital Energy Solutions Larsen&Toubro,Pune	
6	Alumni Member	D.Lakshman Kumar, Asst. professor, Dept. of EEE,Sri Vishnu Engineering College for Women(A), WG Dist.	

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II B.Tech – II Semester

L	T	P	C
0	0	3	1.5

INDUCTION AND SYNCHRONOUS MACHINES LAB
(23EE4L05)

Course Objectives:

The objectives of this course is

- To apply the concepts of speed control methods in 3-phase Induction Motor.
- To experimentally develop circle diagram and obtain equivalent circuit to analyse the performance of 3-phase induction motor
- To apply the concepts of power factor improvement on single phase Induction Motor
- To perform various testing methods on alternators for experimentally predetermine the regulation

List of Experiments

Any 10 experiments of the following are required to be conducted

1. Brake test on three-phase Induction Motor.
2. Circle diagram of three phase induction motor.
3. Speed control of three phase induction motor by V/f method.
4. Equivalent circuit of single-phase induction motor.
5. Power factor improvement of single-phase induction motor by using capacitors.
6. Load test on single phase induction motor.
7. Regulation of a three -phase alternator by synchronous impedance methods.
8. Regulation of three-phase alternator by MMF method.
9. V and Inverted V curves of a three-phase synchronous motor.
10. Determination of X_d , X_q & Regulation of a salient pole synchronous generator.
11. Determination of efficiency of three phase alternator by loading with three phase induction motor.
12. Parallel operation of three-phase alternator with infinite bus bar under no-load condition.
13. Determination of efficiency of a single-phase AC series Motor by conducting Brake test.

Online Learning Resources: <https://em-coep.vlabs.ac.in/List%20of%20experiments.html>

Course Outcomes:

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

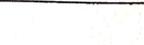
CO1: Analyze the speed control methods on 3-phase Induction Motor.

CO2: Evaluate the performance of 3-phase Induction Motor by obtaining the locus diagram and equivalent circuit of 3-phase Induction Motor

CO3: Adapt the power factor improvement methods for single phase Induction Motor
CO4: Pre-determine the regulation of 3-phase alternator

CO5: Determine the synchronous machine reactance of 3-phase alternator

Note: Students supposed to do an Experiment beyond the syllabus/Lab oriented mini Project/Case Study and submit it for internal valuation.

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II B.Tech – II Semester

CONTROL SYSTEMS LAB
(23EE4L06)

L	T	P	C
0	0	3	1.5

Course Objectives:

- To impart hands on experience to understand the performance of basic control system components such as magnetic amplifiers, D.C. servo motors, A.C. Servo motors and Synchros.
- To understand time and frequency responses of control system with and without Controllers and compensators.
- To know the different logic gates and Boolean expressions using PLC.

List of Experiments:

Any 10 of the following experiments are to be conducted:

1. Analysis of Second order system in time domain
2. Characteristics of Synchros
3. Effect of P, PD, PI, PID Controller on a second order systems
4. Design of Lag and lead compensation – Magnitude and phase plot
5. Transfer function of DC motor
6. Root locus, Bode Plot and Nyquist Plot for the transfer function of systems up to 5th order using MATLAB.
7. Kalman's test of Controllability and Observability using MAT LAB.
8. Temperature controller using PID
9. Characteristics of magnetic amplifiers
10. Characteristics of AC servo motor
11. Characteristics of DC servo motor
12. Study and verify the truth table of logic gates and simple Boolean expressions using PLC

Course Outcomes:

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

CO1: Analyze the performance of Magnetic amplifier, D.C and A.C. servo motors and synchros.

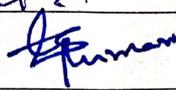
CO2: Design of PID controllers and compensators.

CO3: Evaluate temperature control of an oven using PID controller

CO4: Determine the transfer function of DC Motor and examine the truth table of logicgates using PLC.

CO5: Judge the stability in time and frequency domain and Kalman's test for controllabilityand observability.

Note: Students supposed to do an Experiment beyond the syllabus/Lab oriented mini Project/Case Study and submit it for internal valuation

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Department of Electrical and Electronics Engineering, Bonam Venkata Chalamayya Engineering College.



II Year - II Semester	CODE: 23CS4S04	L	T	P	C
		0	1	2	2

PYTHON PROGRAMMING LAB
(EEE)

Course Objectives:

- Introduce core programming concepts of Python programming language.
- Demonstrate about Python data structures like Lists, Tuples, Sets and dictionaries
- Implement Functions, Modules and Regular Expressions in Python Programming and to create practical and contemporary applications using these

Course Outcomes: Students are able to

COs	Statement	Blooms Level
CO1	Apply basic types to implement python programs	BL3
CO2	Apply functions in problem solving	BL3
CO3	Apply dictionaries in problem solving	BL3
CO4	Implement programs using files	BL3
CO5	Implement python programs using data science libraries	BL3

UNIT – I

History of Python Programming Language, Thrust Areas of Python, Installing Anaconda Python Distribution, Installing and Using Jupyter Notebook.

Parts of Python Programming Language: Identifiers, Keywords, Statements and Expressions, Variables, Operators, Precedence and Associativity, Data Types, Indentation, Comments, Reading Input, Print Output, Type Conversions, the type () Function and Is Operator, Dynamic and Strongly Typed Language.

Control Flow Statements: if statement, if-else statement, if...elif...else, Nested if statement, while Loop, for Loop, continue and break Statements, Catching Exceptions Using try and except Statement.

Sample Experiments:

1. Write a program to find the largest element among three Numbers.
2. Write a Program to display all prime numbers within an interval
3. Write a program to swap two numbers without using a temporary variable.
4. Demonstrate the following Operators in Python with suitable examples.
 - i) Arithmetic Operators ii) Relational Operators iii) Assignment Operators iv) Logical Operators
 - v) Bit wise Operators vi) Ternary Operator vii) Membership Operators viii) Identity Operators
5. Write a program to add and multiply complex numbers
6. Write a program to print multiplication table of a given number.

			online		
Dr. N Ramakrishnaiah, Professor of CSE And Controller of Examinations UCEK, JNTUK Kakinada.	Dr. Jimson Mathew, Professor of CSE, IIT Patna	Dr. B D Sahoo, Professor of CSE, NIT Rourkela.	Rayana Rao Routhu, Technology Manager, Hidden Brains, Ahmadabad.	Dr. S Rao Chintalapudi, Professor and HoD, CSE(AIML) CMR Technical Campus, Hyderabad.	Dr. B S N Murthy Professor of CSE, BVCEC. Head of CSE



UNIT - II

Functions: Built-In Functions, Commonly Used Modules, Function Definition and Calling the function, return Statement and void Function, Scope and Lifetime of Variables, Default Parameters, Keyword Arguments, *args and **kwargs, Command Line Arguments.

Strings: Creating and Storing Strings, Basic String Operations, Accessing Characters in String by Index Number, String Slicing and Joining, String Methods, Formatting Strings.

Lists: Creating Lists, Basic List Operations, Indexing and Slicing in Lists, Built-In Functions Used on Lists, List Methods, del Statement.

Sample Experiments:

1. Write a program to define a function with multiple return values.
2. Write a program to define a function using default arguments.
3. Write a program to find the length of the string without using any library functions.
4. Write a program to check if the substring is present in a given string or not.
5. Write a program to perform the given operations on a list:
 - i. addition
 - ii. insertion
 - iii. slicing
6. Write a program to perform any 5 built-in functions by taking any list.

UNIT - III

Dictionaries: Creating Dictionary, Accessing and Modifying key:value Pairs in Dictionaries, Built-In Functions Used on Dictionaries, Dictionary Methods, del Statement.

Tuples and Sets: Creating Tuples, Basic Tuple Operations, tuple() Function, Indexing and Slicing in Tuples, Built-In Functions Used on Tuples, Relation between Tuples and Lists,

Relation between Tuples and Dictionaries, Using zip() Function, Sets, Set Methods, Frozenset.

Sample Experiments:

1. Write a program to create tuples (name, age, address, college) for at least two members and concatenate the tuples and print the concatenated tuples.
2. Write a program to count the number of vowels in a string (No control flow allowed).
3. Write a program to check if a given key exists in a dictionary or not.
4. Write a program to add a new key-value pair to an existing dictionary.
5. Write a program to sum all the items in a given dictionary.

UNIT - IV

Files: Types of Files, Creating and Reading Text Data, File Methods to Read and Write Data, Reading and Writing Binary Files, Pickle Module, Reading and Writing CSV Files, Python os and os.path Modules.

Object-Oriented Programming: Classes and Objects, Creating Classes in Python, Creating

Objects in Python, Constructor Method, Classes with Multiple Objects, Class Attributes Vs Data Attributes, Encapsulation, Inheritance, Polymorphism

<i>H. Reddy</i>	<i>Jimson</i>	<i>B.D. Sahoo</i>	<i>online</i>	<i>Ch. S. Rao</i>	<i>B.S.N. Murthy</i>
Dr.N Ramakrishnaiah, Professor of CSE And Controller of Examinations UCEK, JNTUK Kakinada.	Dr. Jimson Mathew, Professor of CSE. IIT Patna	Dr. B D Sahoo, Professor of CSE, NIT Rourkela.	Narayana Rao Routhu, Technology Manager, Hidden Brains, Ahmadabad.	Dr. S Rao Chintalapudi, Professor and HoD, CSE(AIML) CMR Technical Campus, Hyderabad.	Dr. B S N Murthy Professor of CSE, BVCEC.

Head of the



Sample Experiments:

1. Write a program to sort words in a file and put them in another file.
The output file should have only lower-case words, so any upper-case words from source must be lowered.
2. Python program to print each line of a file in reverse order.
3. Python program to compute the number of characters, words and lines in a file.
4. Write a program to create, display, append, insert and reverse the order of the items in the array.
5. Write a program to add, transpose and multiply two matrices.
6. Write a Python program to create a class that represents a shape. Include methods to calculate its area and perimeter. Implement subclasses for different shapes like circle, triangle, and square.

UNIT – V

Introduction to Data Science: Functional Programming, JSON and XML in Python, NumPy with Python, Pandas.

Sample Experiments:

1. Python program to check whether a JSON string contains complex object or not.
2. Python Program to demonstrate NumPy arrays creation using array () function.
3. Python program to demonstrate use of ndim, shape, size, dtype.
4. Python program to demonstrate basic slicing, integer and Boolean indexing.
5. Python program to find min, max, sum, cumulative sum of array
6. Create a dictionary with at least five keys and each key represent value as a list where this list contains at least ten values and convert this dictionary as a pandas data frame and explore the data through the data frame as follows:
 - a) Apply head () function to the pandas data frame
 - b) Perform various data selection operations on Data Frame
7. Select any two columns from the above data frame, and observe the change in one attribute with respect to other attribute with scatter and plot operations in matplotlib

Reference Books:

1. Gowri shankar S, Veena A., Introduction to Python Programming, CRC Press.
2. Python Programming, S Sridhar, J Indumathi, V M Hariharan, 2nd Edition, Pearson, 2024
3. Introduction to Programming Using Python, Y. Daniel Liang, Pearson.

Online Learning Resources:

1. <https://www.coursera.org/learn/python-for-applied-data-science-ai>
2. <https://www.coursera.org/learn/python?specialization=python#syllabus>

<i>N. Ramakrishnaiah</i>	<i>Jimson</i>	<i>B. D. Sahoo</i>	<i>online</i>	<i>Ch. S. Rao</i>	<i>B. S. N. Murthy</i>
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Computer Science & Engineering Dep,
BVCE Engineering College, Odalarevu
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Page 3

II B.Tech – II Semester

DESIGN THINKING & INNOVATION
(23ES4L06)

L	T	P	C
1	0	2	2

Course Objectives: The objectives of the course are to

- Bring awareness on innovative design and new product development.
- Explain the basics of design thinking.
- Familiarize the role of reverse engineering in product development.
- Train how to identify the needs of society and convert into demand.
- Introduce product planning and product development process.

UNIT – I: Introduction to Design Thinking

Introduction to elements and principles of Design, basics of design-dot, line, shape, form as fundamental design components. Principles of design. Introduction to design thinking, history of Design Thinking, New materials in Industry.

UNIT - II Design Thinking Process

Design thinking process (empathize, analyze, idea & prototype), implementing the process in driving inventions, design thinking in social innovations. Tools of design thinking - person, costumer, journey map, brainstorming, product development

Activity: Every student presents their idea in three minutes, Every student can present design process in the form of flow diagram or flow chart etc. Every student should explain about product development.

UNIT – III Innovation

Art of innovation, Difference between innovation and creativity, role of creativity and innovation in organizations. Creativity to Innovation. Teams for innovation, Measuring the impact and value of creativity.

Activity: Debate on innovation and creativity, Flow and planning from idea to innovation, Debate on value-based innovation.

UNIT – IV Product Design

Problem formation, introduction to product design, Product strategies, Product value, Product planning, product specifications. Innovation towards product design Case studies.

Activity: Importance of modeling, how to set specifications, Explaining their own product design.

UNIT – V Design Thinking in Business Processes

Design Thinking applied in Business & Strategic Innovation, Design thinking principles that redefine business –Business challenges- Growth, Predictability, Change, Maintaining Relevance, Extreme competition, Standardization. Design thinking to meet corporate needs. Design thinking for Startups. Defining and testing Business Models and Business Cases. Developing & testing prototypes.

Activity: How to market our own product, about maintenance, Reliability, and plan for start-up.

 
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Textbooks:

1. Tim Brown, Change by design, 1/e, Harper Bollins, 2009.
2. Idris Mootee, Design Thinking for Strategic Innovation, 1/e, Adams Media, 2014.

Reference Books:

1. David Lee, Design Thinking in the Classroom, Ulysses press, 2018.
2. Shrutin N Shetty, Design the Future, 1/e, Norton Press, 2018.
3. Chesbrough,H, The era of open innovation, 2003.

Online Learning Resources:

- <https://nptel.ac.in/courses/110/106/110106124/>
- <https://nptel.ac.in/courses/109/104/109104109/>
- https://swayam.gov.in/nd1_noc19_mg60/preview
- https://onlinecourses.nptel.ac.in/noc22_de16/preview

Course Outcomes:

COs	Statements	Blooms Level
CO1	Define the concepts related to design thinking.	L1
CO2	Explain the fundamentals of Design Thinking and innovation.	L2
CO3	Apply the design thinking techniques for solving problems in various sectors.	L3
CO4	Analyse to work in a multidisciplinary environment.	L4
CO5	Evaluate the value of creativity.	L5

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