BONAM VENKATA CHALAMAYYA ENGINEERING COLLEGE (A)

DEPARTMENT OF ELECTRICAL AND ELECTRONICS ENGINEERING

II-B.Tech Course structure & Syllabus

BR23 Regulations

II B.Tech. - I Semester

S.No.	Course Code	Category of course	Subjects	L	T	P	C
1	23BS3T06	BS	Complex Variables & Numerical Methods	3	0	0	3
2	23HM3T02	HSMC	Universal human values – understanding harmony and Ethical human conduct	2	1	0	3
3	23ES3T06	ES	Electromagnetic Field Theory	3	0	0	3
4	23EE3T03	PC	Electrical Circuit Analysis-II	3	0	0	3
5	23EE3T04	PC	DC Machines & Transformers	3	0	0	3
6	23EE3L03	PC	Electrical Circuit Analysis-II and Simulation Lab	0	0	3	1.5
7	23EE3L04	PC	DC Machines & Transformers Lab	0	0	3	1.5
8	23CS3S01	SEC	Data Structures Lab	0	1	2	2
9	23AC3T01	AC	Environmental Science	2	0	0	-
Total				16	2	8	20

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.	

Dept. of E.E.E. & E.C.E.
University College of Engineering
JNT University Kakinada
KAKINADA-533 003

II Year - I Semester	Subject code: 23BS3T06	L	T	P	C
		3	0	0	3

COMPLEX VARIABLES AND NUMERICAL METHODS

(Electrical and Electronics Engineering)

Course Objectives:

- To elucidate the different numerical methods to solve nonlinear algebraic equation.
- To disseminate the use of different numerical techniques for carrying out numerical integration.
- To familiarize the complex variables
- To equip the students to solve application problems in their disciplines.

Course Outcomes:

Students are able to

CO Number	Course Outcome	Blooms Level
CO 1	Evaluate the approximate roots of polynomial and transcendental equation by different algorithms. Apply Newton's forward and Backward interpolation and Lagranges formulae for equal and unequal intervals.	BL 3
CO 2	Apply numerical integral techniques to different Engineering Problems. Apply different algorithms for approximating the solutions of ordinary differential equations with initial conditions to its analytical computations.	BL 3
CO 3	Apply Cauchy-Riemann equations to complex functions in order to determine whether a given continuous function is analytic.	BL 3
CO 4	Evaluate the Taylor and Laurent expansions of simple functions, determine in the nature of the singularities and calculating residues. Make use of Cauchy residue theorem to evaluate certain integrals.	BL 3
CO 5	Explain properties of various types of conformal mappings	BL 3

A.D. Madhuri
(Chairman-BOS)

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(University Nominee)

Dr. T.S.R.Murthy
(SubjectExpert)

Dr.U.VenuGopalam
(Subject Expert)

P.K.V.Subrahmanyam.
(Member, BOS)

UNIT–I:

Iterative Methods:

Introduction – Solutions of algebraic and transcendental equations: Bisection method - Secant method – Method of false position – General Iteration method – Newton –Raphson Method

Interpolation: Difference Operator -Forward, Backward, Central Operators and their Properties-Newton's forward and backward formulae for interpolation -interpolation with unequal intervals – Lagrange's interpolation formula

UNIT–II:

Numerical integration, Solution of ordinary differential equation with initial conditions:

Trapezoidal rule– Simpson's $1/3^{rd}$ and $3/8^{th}$ rule –Solution of initial value problems by Taylor's series – Picard's method of successive approximations - Euler's method – Modified Euler's Method - Runge- Kutta method (second and fourth order) – Milne's Predictor and Corrector Method

UNIT – III:

Functions of a complex variable and Complex integration:

Introduction – Limits- Continuity – Differentiability – Analyticity - Cauchy – Riemann equations in Cartesian and polar coordinates - Harmonic and conjugate harmonic function – Milne-Thompson method.

Complex integration: Line integral –Cauchy's integral theorem - Cauchy's integral formula - Generalized integral formula (all without proofs) and problems on above theorems.

UNIT- IV:

Series expansions and Residue Theorem:

Radius of convergence – Expansion of function in Taylor's series, Maclaurin's series and Laurent series. Types of Singularities: Isolated – Essential singularities – Pole of order m – Residues – Residues theorem (without proof) – Evaluation of real integral of the types $\int_{-\infty}^{\infty} f(x)dx$ and $\int_0^{2\pi} f(\cos\theta, \sin\theta)d\theta$.

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UNIT-V:

Conformal mapping:

Transformation - e^z, $\ln z$, z^2, z^n(n positive integer), $\sin z, \cos z$, $z + \frac{a}{z}$

Translation, rotation, inversion and bilinear transformation – fixed point – cross ratio – properties - invariance of circles and cross ratio – determination of bilinear transformation mapping 3 given points.

Textbooks:

1. **B. S. Grewal,** Higher Engineering Mathematics, 44th Edition, Khanna Publishers
2. **B.V Ramana,** Higher Engineering Mathematics, 2007 Edition, Tata Mc. Graw Hill Education

Reference Books:

1. **Erwin Kreyszig,** Advanced Engineering Mathematics, 10th Edition, Wiley – India.
2. **Michael Greenberg,** Advanced Engineering Mathematics, 2nd edition, Pearson publishers.
3. **Steven C. Chapra,** Applied Numerical Methods with MATLAB for Engineering and Science, Tata Mc. Graw Hill Education.
4. **M. K. Jain,** S.R.K Iyengar and R. K. Jain, Numerical Methods for Scientific and Engineering computation, New age International Publication.
5. **J. W. Brown and R. V. Churchill,** Complex Variables and Application, 9th edition,Mc. Graw Hill, 2013

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BONAM VENKATA CHALAMAYYA ENGINERING COLLEGE ODALAREVU – 533 210,
Andhra Pradesh, India

II Year - I Semester	Code: 23HM3T02	L	T	P	C
		2	1	0	3

UNIVERSAL HUMAN VALUES-UNDERSTANDING HARMONY AND ETHICAL HUMAN CONDUCT

(Common to all)

ourse Objectives:

e learning objectives of this course are to:

- To help the students appreciate the essential complementary between 'VALUES' and 'SKILLS' to ensure sustained happiness and prosperity which are the core aspirations of all human beings.
- To facilitate the development of a Holistic perspective among students towards lifeand profession as well as towards happiness and prosperity based on a correct understanding of the Human reality and the rest of existence. Such holisticperspective forms the basis of Universal Human Values and movement towards value-based living in a natural way.
- To highlight plausible implications of such a Holistic understanding in terms of ethical human conduct, trustful and mutually fulfilling human behaviour and mutually enriching interaction with Nature.

urse Outcomes: Students are able to

CO Number	Course Outcome	Blooms Level
CO1	Define the terms like Natural Acceptance, Happiness and Prosperity	BL1,2
CO2	Identify one's self, and one's surroundings (family, society nature).	BL1,2
CO3	Apply what they have learnt to their own self in different day-to-day settings inreal life	BL3
CO4	Relate human values with human relationship and human society.	BL4
CO5	Justify the need for universal human values and harmonious existence	BL5
CO6	Develop as socially and ecologically responsible engineers	BL3,6

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Dr. N.Uday Bhaskar
(University Nominee)

Dr. M.Sree Ramaraju
(Subject Expert)

Dr. B.Charwak
(Subject Expert)

Mr. M.Raja
(Member)

Course Topics

The course has 28 lectures and 14 tutorials in 5 modules. The lectures and tutorials are of 1- hour duration. Tutorial sessions are to be used to explore and practice what has been proposed during the lecture sessions.

The Teacher's Manual provides the outline for lectures as well as practice sessions. The teacher is expected to present the issues to be discussed as propositions and encourage the students to have a dialogue

UNIT I Introduction to Value Education (6 lectures and 3 tutorials for practicesession)

Lecture 1: Right Understanding, Relationship and Physical Facility (HolisticDevelopment and the Role of Education)
Lecture 2: Understanding Value Education
Tutorial 1: Practice Session PS1 Sharing about Oneself
Lecture 3: self-exploration as the Process for Value Education
Lecture4: Continuous Happiness and Prosperity – the Basic Human Aspirations
Tutorial 2: Practice Session PS2 Exploring Human Consciousness
Lecture 5: Happiness and Prosperity – Current Scenario
Lecture 6: Method to Fulfill the Basic Human Aspirations
Tutorial 3: Practice Session PS3 Exploring Natural Acceptance

UNIT II Harmony in the Human Being (6 lectures and 3 tutorials for practice session)

Lecture 7: Understanding Human being as the Co-existence of the self and thebody.
Lecture 8: Distinguishing between the Needs of the self and the body
Tutorial 4: Practice Session PS4 Exploring the difference of Needs of self andbody.
Lecture 9: The body as an Instrument of the self
Lecture 10: Understanding Harmony in the self
Tutorial 5: Practice Session PS5 Exploring Sources of Imagination in the selfLecture 11: Harmony of the self with the body
Lecture 12: Programme to ensure self-regulation and Health
Tutorial 6: Practice Session PS6 Exploring Harmony of self with the body

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T III

Harmony in the Family and Society (6 lectures and 3 tutorials for practicesession)
Lecture 13: Harmony in the Family – the Basic Unit of Human Interaction
Lecture 14: 'Trust' – the Foundational Value in Relationship
Tutorial 7: Practice Session PS7 Exploring the Feeling of Trust
Lecture 15: 'Respect' – as the Right Evaluation
Tutorial 8: Practice Session PS8 Exploring the Feeling of Respect
Lecture 16: Other Feelings, Justice in Human-to-Human Relationship
Lecture 17: Understanding Harmony in the Society
Lecture 18: Vision for the Universal Human Order
Tutorial 9: Practice Session PS9 Exploring Systems to fulfil Human Goal

T IV Harmony in the Nature/Existence (4 lectures and 2 tutorials for practicesession)
Lecture 19: Understanding Harmony in the Nature
Lecture 20: Interconnectedness, self-regulation and Mutual Fulfilment amongthe Four Orders of Nature
Tutorial 10: Practice Session PS10 Exploring the Four Orders of Nature
Lecture 21: Realizing Existence as Co-existence at All Levels
Lecture 22: The Holistic Perception of Harmony in Existence
Tutorial 11: Practice Session PS11 Exploring Co-existence in Existence.

IT V Implications of the Holistic Understanding – a Look at Professional Ethics (6 ures and 3 tutorials for practice session)
Lecture 23: Natural Acceptance of Human Values
Lecture 24: Definitiveness of (Ethical) Human Conduct
Tutorial 12: Practice Session PS12 Exploring Ethical Human Conduct
Lecture 25: A Basis for Humanistic Education Humanistic Constitution andUniversal Human Order
Lecture 26: Competence in Professional Ethics
Tutorial 13: Practice Session PS13 Exploring Humanistic Models in Education
Lecture 27: Holistic Technologies, Production Systems and Management Models-Typical Case Studies
Lecture 28: Strategies for Transition towards Value-based Life and Profession
Tutorial 14: Practice Session PS14 Exploring Steps of Transition towards Universal Human Order

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Practice Sessions for UNIT I – Introduction to Value EducationPS1 Sharing about Oneself

PS2 Exploring Human ConsciousnessPS3 Exploring Natural Acceptance

Practice Sessions for UNIT II – Harmony in the Human BeingPS4 Exploring the difference of Needs of self and body

PS5 Exploring Sources of Imagination in the selfPS6 Exploring Harmony of self with the body

Practice Sessions for UNIT III – Harmony in the Family and SocietyPS7 Exploring the Feeling of Trust

PS8 Exploring the Feeling of Respect

PS9 Exploring Systems to fulfil Human Goal

Practice Sessions for UNIT IV – Harmony in the Nature (Existence)PS10 Exploring the Four Orders of Nature

PS11 Exploring Co-existence in Existence

Practice Sessions for UNIT V – Implications of the Holistic Understanding – a Look at ProfessionalEthics

PS12 Exploring Ethical Human Conduct

PS13 Exploring Humanistic Models in Education

PS14 Exploring Steps of Transition towards Universal Human Order

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Mr. M.Raja
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Text Books:

The Textbook

R R Gaur, R Asthana, G P Bagaria, *A Foundation Course in Human Values and Professional Ethics*, 2nd Revised Edition, Excel Books, New Delhi, 2019. ISBN 978-93-87034-47-1

The Teacher's Manual

R R Gaur, R Asthana, G P Bagaria, *Teachers' Manual for A Foundation Course in Human Values and Professional Ethics*. 2nd Revised Edition, Excel Books, New Delhi, 2019. ISBN 978-93-87034-53-2

Reference Books:

1. *JeevanVidya: EkParichaya*, A Nagaraj, JeevanVidyaPrakashan, Amarkantak, 1999.
2. *Human Values*, A.N. Tripathi, New Age Intl. Publishers, New Delhi, 2004.
3. *The Story of Stuff* (Book).
4. *The Story of My Experiments with Truth* - by Mohandas Karamchand Gandhi
5. *Small is Beautiful* - E. F Schumacher.
6. *Slow is Beautiful* - Cecile Andrews
7. *Economy of Permanence* - J C Kumarappa
8. *Bharat Mein Angreji Raj* – PanditSunderlal
9. *Rediscovering India* - by Dharampal
10. *Hind Swaraj or Indian Home Rule* - by Mohandas K. Gandhi
11. *India Wins Freedom* - Maulana Abdul Kalam Azad
12. *Vivekananda* - Romain Rolland (English)
13. *Gandhi* - Romain Rolland (English)

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lode of Conduct:

cture hours are to be used for interactive discussion, placing the proposals about the topics at
d motivating students to reflect, explore and verify them.

utorial hours are to be used for practice sessions.

hile analyzing and discussing the topic, the faculty mentor's role is in pointing to essential eleme
lp in sorting them out from the surface elements. In other words, help the students explor
portant or critical elements.

the discussions, particularly during practice sessions (tutorials), the mentor encourages the stud
nnect with one's own self and do self-observation, self-reflection and self-exploration.

enarios may be used to initiate discussion. The student is encouraged to take up "ordinary" situ
ther than" extra-ordinary" situations. Such observations and their analyses are shared and disc
th other students and faculty mentor, in a group sitting. Tutorials (experiments or practica
portant for the course. The difference is that the laboratory is everyday life, and practical are
u behave and work in real life. Depending on the nature of topics, worksheets, home assign
d/or activity are included. The practice sessions (tutorials) would also provide support to a stud
rforming actions commensurate to his/her beliefs. It is intended that this would lead to develo
commitment, namely behaving and working based on basic human values.It is recommended th
ntent be placed before the student as it is, in the form of a basic foundation course, without incl
thing else or excluding any part of this content. Additional content may be offered in sep
gher courses. This course is to be taught by faculty from every teaching department, not exclu
any one department.

acher preparation with a minimum exposure to at least one 8-day Faculty Development Progr
iversal Human Values is deemed essentia

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e Resources:

1. https://fdp-si.aicte-india.org/UHV-II%20Class%20Notes%20&%20Handouts/UHV%20Handout%201-Introduction%20to%20Value%20Education.pdf
2. https://fdp-si.aicte-india.org/UHV-II%20Class%20Notes%20&%20Handouts/UHV%20Handout%202-Harmony%20in%20the%20Human%20Being.pdf
3. https://fdp-si.aicte-india.org/UHV-II%20Class%20Notes%20&%20Handouts/UHV%20Handout%203- Harmony%20in%20the%20Family.pdf
4. https://fdp-si.aicte-india.org/UHV%201%20Teaching%20Material/D3-S2%20Respect%20July%2023.pdf
5. https://fdp-si.aicte-india.org/UHV-II%20Class%20Notes%20&%20Handouts/UHV%20Handout%205-Harmony%20in%20the%20Nature%20and%20Existence.pdf
6. https://fdp-si.aicte-india.org/download/FDPTeachingMaterial/3-days%20FDP-SI%20UHV%20Teaching%20Material/Day%203%20Handouts/UHV%203D%20D3- S2A%20Und%20Nature-Existence.pdf
7. https://fdp-si.aicte-india.org/UHV%20II%20Teaching%20Material/UHV%20II%20Lecture%2023- 25%20Ethics%20v1.pdf

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(Member)

II B.Tech – I SEMESTER

L	T	P	C
3	0	0	3

ELECTROMAGNETIC FIELD THEORY
(23ES3T06)

Pre-requisite: Concepts of Differential Equations, Vector Calculus and Analysis
Course Objectives:

- To study the production of electric field and potentials due to different configurations of static charges.
- To study the properties of conductors and dielectrics, calculate the capacitance of Different configurations. Understand the concept of conduction and convection current Densities.
- To study the magnetic fields produced by currents in different configurations, application of Ampere's law and the Maxwell's second and third equations.
- To study the magnetic force and torque through Lorentz force equation in magnetic field environment like conductors and other current loops.
- To develop the concept of self and mutual inductances and the energy stored.
- To study time varying and Maxwell's equations in different fourth equation for the induced EMF.

UNIT – I
Electrostatics (BTL-1)
Rectangular & Cylindrical Coordinate Systems, Del & Curl operators, Divergence and Stoke's theorems (definitions only). Coulomb's law and Electric field intensity (EFI), EFI due to Continuous charge distributions (line and surface charge), Electric flux density, Gauss's law (Maxwell's first equation, $\nabla . D = \rho V$), Applications of Gauss's law, Electric Potential, Work done in moving a point charge in an electrostatic field (second Maxwell's equation for static electric fields,$\nabla \times E = 0$), Potential gradient, Laplace's and Poison's equations.

UNIT - II
Conductors – Dielectrics and Capacitance (BTL-2)
Ohm's law in point form, Behavior of conductors in an electric field, Polarization, dielectric constant and strength, Continuity equation and relaxation time, Boundary conditions between conductor to dielectric, dielectric to dielectric and conductor to free space, Capacitance of parallel plate, coaxial and spherical capacitors, Energy stored and density in a static electric field.

UNIT - III
Magneto statics, Ampere's Law and Force in magnetic fields: (BTL-3)
Biot-Savart's law and its applications viz. Straight current carrying filament, circular, square, rectangle and solenoid current carrying wire – Magnetic flux density and Maxwell's second Equation ($\nabla . \vec{B} = 0$), Ampere's circuital law and its applications viz. MFI due to an infinite sheet, long filament, solenoid, toroidal current carrying conductor, point form of Ampere's circuital law, Maxwell's third equation ($\nabla \times H = J$).
Magnetic force, moving charges in a magnetic field – Lorentz force equation, force on a current element in a magnetic field, force on a straight and a long current carrying conductor in a magnetic field, force between two straight long and parallel current carrying conductors, Magnetic dipole, Magnetic torque, and moment.

UNIT - IV
Self and mutual inductance: (BTL-4)
Self and mutual inductance – determination of self-inductance of a solenoid, toroid, coaxial cable and mutual inductance between a straight long wire and a square loop wire in the same plane – Energy stored and energy density in a magnetic field.

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UNIT - V

Time Varying Fields: (BTL-2)

Faraday's laws of electromagnetic induction, Maxwell's fourth equation($\nabla \times \vec{E} = -db/dt$) integral and point forms of Maxwell's equations, statically and dynamically induced EMF, Displacement current, Modification of Maxwell's equations for time varying fields, Poynting theorem and Poynting vector.

Textbooks:

1."Elements of Electromagnetics" by Matthew N O Sadiku, Oxford Publications,7th edition, 2018.
2."Engineering Electromagnetics" by William.H.Hayt & John. A. Buck Mc. Graw -Hill, 7th Editon,2006.
3. "Electromagnetic Filed Theory" by U.A.Bhakshi, Late A.V Bhakshi, Technical Publications, 3rd edition, 2023.

Reference Books:

1. "Introduction to Electro Dynamics" by D J Griffiths, Prentice-Hall of India Pvt. Ltd, 2nd edition.
2. "Electromagnetic Field Theory" by Yaduvir Singh, Pearson India, 1st edition, 2011.
3. "Fundamentals of Engineering Electromagnetics" by Sunil Bhooshan, OxfordUniversity Press, 2012.

Online Learning Resources:

1. https://archive.nptel.ac.in/courses/108/106/108106073/
2. https://nptel.ac.in/courses/117103065

Course Outcomes:

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

CO1: Understand the concepts of electric fields and potentials using Coulomb's law & Gauss law/ solve Laplace's or Poisson's equations for various electric charge distributions.

CO2: Analyze the behaviour of conductors in electric fields, the capacitance and energy stored in dielectrics.

CO3: Calculate the magnetic field intensity due to current carrying conductors, understanding the application of Ampere's law, Maxwell's second and third law.

CO4: Estimate self and mutual inductances and the energy stored in the magnetic field.

CO5: Understand the concepts of Faraday's laws, Displacement current, Poynting theorem and Poynting vector.

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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Associate Professor
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II B.Tech –I SEMESTER

L	T	P	C
3	0	0	3

ELECTRICAL CIRCUIT ANALYSIS-II
(23EE3T03)

Pre-requisite: Analysis of DC and Single phase AC Circuits, Concepts of differentiation and integration.

Course Objectives:

- To understand three phase circuits
- To analyse transients in electrical systems
- To evaluate network parameters of given electrical network
- To apply Fourier analysis to electrical systems
- To understand graph theory for circuit analysis and to understand the behaviour of filters

UNIT – I (BTL-2)

Analysis of three phase balanced circuits

Phase sequence, star and delta connection of sources and loads, relation between line and phase quantities, analysis of balanced three phase circuits, and measurement of active and reactive power.

Analysis of three phase unbalanced circuits:

Loop method, Star-Delta transformation technique, two-wattmeter method for measurement of three phase power.

UNIT – II (BTL-2)

Laplace transforms – Definition and Laplace transforms of standard functions– Shifting theorem – Transforms of derivatives and integrals, Inverse Laplace transforms and applications.

Transient Analysis: Transient response of series R-L, R-C and R-L-C circuits for D.C. and sinusoidal excitations – Initial conditions - Solution using differential equation approach and Laplace transform approach.

UNIT – III (BTL-3)

Network Parameters: Impedance parameters, Admittance parameters, Hybrid parameters, Transmission (ABCD) parameters, conversion of Parameters from one form to other, Conditions for Reciprocity and Symmetry, Interconnection of Two Port networks in Series, Parallel and Cascaded configurations- problems.

UNIT – IV (BTL-4)

Analysis of Electric Circuits with Periodic Excitation: Fourier series and evaluation of Fourier coefficients, Trigonometric and complex Fourier series for periodic waveforms, Application to Electrical Systems – Effective value and average value of non-sinusoidal periodic waveforms(square).

UNIT – V (BTL-4)

Filters: Classification of filters-Low pass, High pass, Band pass and Band Elimination filters, Constant-k filters -Low pass and High Pass. Design of basic low pass and high pass filters.

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Textbooks:

1. Eelectrical Circuit Analysis II(network theory), U.A.Bakshi, Dr.J.S.chitode , Late A.V. Bakshi , 1st Edition,Technical publications, 2023
2. Fundamentals of Electric Circuits, Charles K. Alexander, Mathew N. O. Sadiku, 3rdEdition, Tata McGraw-Hill, 2019

Reference Books:

1. Network Analysis, M. E. Van Valkenburg, 3rd Edition, PHI, 2019.
2. Network Theory, N. C. Jagan and C. Lakshminarayana, 1st Edition, B. S. Publications, 2012.
3. Circuits and Networks Analysis and Synthesis, A. Sudhakar, Shyam Mohan S. Palli, 5th Edition, Tata McGraw-Hill, 2017.
4. Engineering Network Analysis and Filter Design (Including Synthesis of One Port Networks)- Durgesh C. Kulshreshtha Gopal G. Bhise, Prem R. Chadha ,Umesh Publications 2012.
5. Circuit Theory: Analysis and Synthesis, A. Chakrabarti, Dhanpat Rai & Co., 2018, 7th Revised Edition.

Online Learning Resources:

1. https://archive.nptel.ac.in/courses/117/106/117106108/
2. https://archive.nptel.ac.in/courses/108/105/108105159/

Course Outcomes:

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

CO1: Analyse the balanced and unbalanced 3 phase circuits for power calculations.
CO2: Analyse the transient behaviour of electrical networks in different domains.
CO3: Estimate various Network parameters.
CO4: Apply the concept of Fourier series to electrical systems.
CO5: Analyse the filter circuit for electrical circuits.

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Associate Professor
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II B.Tech – I SEMESTER

L	T	P	C
3	0	0	3

DC MACHINES & TRANSFORMERS

(23EE3T04)

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

Course Objectives:

Students will get exposure to

- Understand the characteristics and applications of DC Machines.
- Develop problem solving skills about the starting, speed control and testing of DC Machines.
- Understand the concepts of efficiency and regulation of a transformer by obtaining Equivalent circuit.
- Analyze the performance of single-phase transformers and to understand the connection diagrams of three-phase transformers

UNIT – I

DC Generators: (BTL-1)

Construction and principle of operation of DC machines – EMF equation for generator – Excitation techniques – characteristics of DC generators –applications of DC Generators,Back-EMF and torque equations of DC motor – Armature reaction and commutation.

UNIT – II

Starting, Speed Control and Testing of DC Machines (BTL-2)

Characteristics of DC motors – losses and efficiency – applications of DC motors. Necessity of a starter – starting by 3-point and 4-point starters – speed control by armature voltage and field current control – testing of DC machines – brake test, Swinburne's test –Hopkinson's test.

UNIT – III

Single-phase Transformers (BTL-3)

Introduction to single-phase Transformers (Construction and principle of operation)–EMF equation – operation on no-load and on load –lagging, leading and unity power factors loads –phasor diagrams– equivalent circuit –regulation – losses and efficiency – effect of variation of frequency and supply voltage on losses – all day efficiency.

UNIT –IV

Testing of Transformers (BTL-4)

Open Circuit and Short Circuit tests – Sumpner's test – separation of losses— Parallel operation with equal and unequal voltage ratios– auto transformer – equivalent circuit – comparison with two winding transformers.

UNIT – V

Three-Phase Transformers: (BTL-4)

Poly-phase connections- Y/Y, Y/Δ, Δ/Y, Δ/Δ, open Δ – third harmonics in phase voltages– Parallel operation–three winding transformers-off load and on load tap changing transformers–Scott connection.

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Textbooks:

1. Electrical Machinery by Dr. P S Bimbhra, 7th edition, Khanna Publishers, New Delhi,1995.
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 by D. P.Kothari, I .J .Nagarth, McGraw Hill Publications, 5thedition
2. Electrical Machinery Fundamentals by Stephen J Chapman McGraw Hill edition 2011.
3. Generalized Theory of Electrical Machines by Dr. P S Bimbhra, 7th Edition,
4. Theory & Performance of Electrical Machines by J.B.Gupta,
5. Electric Machinery by Fitzgerald, A.E.,Kingsley, Jr.,C.,& Umans, S. D, 7th edition, McGraw-Hill Education, 2014.
6. Electrical machines-I By U.A.Bakshi and M.V.Bakshi Technical publications.

Online Learning Resources:

1. nptel.ac.in/courses/108/105/108105112
2. nptel.ac.in/courses/108/105/108105155

Course Outcomes:

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

CO1: Understand the process of voltage build-up in DC generators and characteristics.

CO2: Understand the process of torque production, starting and speed control of DC motors and illustrate their characteristics.

CO3: Study the principle and operation and obtain the equivalent circuit of single-phase transformer and determine its efficiency& regulation.

CO4: To study the performance of single phase transformer by the suitable testing methods.

CO5: Analyse various configurations of three-phase transformers.

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 – I SEMESTER

L	T	P	C
0	0	3	1.5

ELECTRICAL CIRCUIT ANALYSIS-II AND SIMULATION LAB
(23EE3L03)

Course Objectives:

- To measure three phase Active and Reactive power
- To analyse transient behaviour of circuits
- To determine 2-port network parameters
- To analyse electrical circuits using simulation tools

List of Experiments

Any 10 of the following experiments are to be conducted:

1. Measurement of Active Power and Reactive Power for balanced loads.
2. Measurement of Active Power and Reactive Power for unbalanced loads.
3. Determination of Z and Y parameters.
4. Determination of ABCD and hybrid parameters
5. Verification of Kirchhoff's current law and voltage law using simulation tools.
6. Verification of mesh and nodal analysis using simulation tools.
7. Verification of super-position theorem and maximum power transfer theorems using simulation tools.
8. Verification of Reciprocity and Compensation theorems using simulation tools.
9. Verification of Thevenin's and Norton's theorems using simulation tools.
10. Verification of series and parallel resonance using simulation tools.
11. Simulation and analysis of transient response of RL, RC and RLC circuits.
12. Verification of self inductance and mutual inductance by using simulation tools.

Course Outcomes:

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

CO1: Understand the power calculations in three phase circuits.
CO2: Evaluate the time response of given network.
CO3: Evaluate two port network parameters.
CO4: Simulate and analyse electrical circuits using suitable software.

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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1	Chairman	Dr. S.Srikanth , Professor & HOD	
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II B.Tech I SEMESTER

L	T	P	C
0	0	3	1.5

DC MACHINES & TRANSFORMERS LAB
(23EE3L04)

Course Objectives:

The objectives of this course is

- To conduct the experiment and plot the characteristics and applications of DC machines.
- To perform the starting, speed control and testing methods of DC Machines.
- To determine/Predetermine efficiency and regulation of the transformer throughequivalent circuit.

List of Experiments

Any 10 of the following experiments are to be conducted:

1. Speed control of DC shunt motor by Field Current and Armature Voltage Control.
2. Brake test on DC shunt motor- Determination of performance curves.
3. Swinburne's test - Predetermination of efficiencies as DC Generator and Motor.
4. Hopkinson's test on DC shunt Machines.
5. Load test on DC compound generator-Determination of characteristics.
6. Load test on DC shunt generator-Determination of characteristics.
7. Fields test on DC series machines-Determination of efficiency.
8. Brake test on DC compound motor-Determination of performance curves.
9. OC & SC tests on single phase transformer.
10. Sumpner's test on single phase transformer.
11. Scott connection of transformers.
12. Parallel operation of Single-phase Transformers.
13. Separation of core losses of a single-phase transformer.

Online Learning Resources:

1. https://ems-iitr.vlabs.ac.in/List%20of%20experiments.html

Course Outcomes:

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

CO1: Demonstrate starting and speed control methods of DC Machines.
CO2: Apply theoretical concepts in analyzing the performance characteristics of DCMachines.
CO3: Determine the performance characteristics of DC machines using different testingmethods.
CO4: Determine the performance parameters of single-phase transformer.

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 Year - I Semester	CODE: 23CS3S01	L	T	P	C
		0	1	2	2

DATA STRUCTURES LAB
(EEE)

Course Objectives:

- To provide the knowledge of basic data structures and their implementations
- To understand importance of data structures in context of writing efficient programs.
- To develop skills to apply appropriate data structures in problem solving.

Course Outcomes: Students are able to

COs	Statement	Blooms Level
CO1	Identify the role of data structures in organizing and accessing data.	BL1
CO2	Apply linked lists for dynamic data storage.	BL3
CO3	Develop applications using stacks and queues.	BL3
CO4	Design and implement algorithms for operations on binary trees and binary search trees	BL3
CO5	Devise novel solutions to small scale programming challenges involving data structures such as stacks, queues, Trees.	BL3

UNIT – I

Introduction to Data Structures: Definition and importance of Data structures, Abstract data types (ADTs) and its specifications, Arrays: Introduction, 1-D, 2-D Arrays, accessing elements of array, Row Major and Column Major storage of Arrays, Searching Techniques: Linear & Binary Search, Sorting Techniques: Bubble sort, Selection sort, Quick sort.

Sample experiments:

1.Program to find min & max element in an array.
2.Program to implement matrix multiplication.
3.Find an element in given list of sorted elements in an array using Binary search.
4.Implement Selection and Quick sort techniques.

UNIT - II

Linked Lists: Singly linked lists: representation and operations, doubly linked lists and circular linked lists, Comparing arrays and linked lists, Applications of linked lists.

Sample experiments:

1.Write a program to implement the following operations.
a. Insert b. Deletion c. Traversal
2.Write a program to store name, roll no, and marks of students in a class using circular double linked list.
3.Write a program to perform addition of given two polynomial expressions using linked list.

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.

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UNIT - III

Stacks: Introduction to stacks: properties and operations, implementing stacks using arrays and linked lists, Applications of stacks in expression evaluation, backtracking, reversing list etc.

Sample experiments:

1.Implement stack operations using
   a. Arrays b. Linked list
2.Convert given infix expression into post fix expression using stacks.
3.Evaluate given post fix expression using stack.
4.Write a program to reverse given linked list using stack.

UNIT - IV

Queues: Introduction to queues: properties and operations, Circular queues, implementing queues using arrays and linked lists, Applications of queues scheduling, etc.

Deques: Introduction to deques (double-ended queues), Operations on deques and their applications.

Sample experiments:

1.Implement Queue operations using
   a. Arrays b. Linked list
2.Implement Circular Queue using
   a.Arrays b. Linked list
3.Implement Dequeue using linked list.

UNIT – V

Trees: Introduction to Trees, Binary trees and traversals, Binary Search Tree – Insertion, Deletion & Traversal

Sample experiments:

1.Implement binary tree traversals using linked list.
2.Write program to create binary search tree for given list of integers. Perform in-order traversal of the tree. Implement insertion and deletion operations.

Textbooks:

1.Data Structures and algorithm analysis in C, Mark Allen Weiss, Pearson, 2nd Edition.
2.Fundamentals of data structures in C, Ellis Horowitz, Sartaj Sahni, Susan Anderson- Freed, Silicon Press, 2008

Reference Books:

1.Algorithms and Data Structures: The Basic Toolbox by Kurt Mehlhorn and Peter Sanders.
2.C Data Structures and Algorithms by Alfred V. Aho, Jeffrey D. Ullman, and John E. Hopcroft.
3.Problem Solving with Algorithms and Data Structures by Brad Miller and David Ranum.
4.Introduction to Algorithms by Thomas H. Cormen, Charles E. Leiserson, Ronald L. Rivest, and Clifford Stein.
5.Algorithms in C, Parts 1-5 (Bundle): Fundamentals, Data Structures, Sorting, Searching, and Graph Algorithms" by Robert Sedgewick.

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BONAMVENKATACHALAMAYYAENGINEERINGCOLLEGE,
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Autonomous

Regulation	BR23				
II Year I Semester	Course Code: 23AC3T01	L	T	P	C
		2	0	0	--
Course Title:	ENVIRONMENTAL SCIENCE				

Course Objectives:

1. To make the students to get awareness on environment
2. To understand the importance of protecting natural resources, ecosystems for future
3. generations and pollution causes due to the day-to-day activities of human life
4. To save earth from the inventions by the engineers

Course Outcomes:

COs	Statements	Blooms Level
CO1	Graspmulti-disciplinarynatureofenvironmentalstudiesandvarious renewableandnon-renewableresources.	L2
CO2	Understandflow and bio-geo- chemical cycles and ecological pyramids.	L2
CO3	Understandvariouscausesofpollutionandsolidwastemanagement andrelatedpreventivemeasures.	L2
CO4	Understandtherainwaterharvesting,watershedmanagement,ozone layerdepletionandwastelandreclamation.	L2
CO5	Illustratethecausesofpopulationexplosion,valueeducationand welfareprogrammes.	L3

UNIT – I

Multidisciplinary Nature of Environmental Studies: – Definition, Scope and Importance – Need for Public Awareness.

Natural Resources : Renewable and non-renewable resources – Natural resources and associated problems – Forest resources – Use and over – exploitation, deforestation, case studies – Timber extraction – Mining, dams and other effects on forest and tribal people – Water resources – Use and over utilization of surface and ground water – Floods, drought, conflicts over water, dams – benefits and problems – Mineral resources: Use and exploitation, environmental effects of extracting and using mineral resources, case studies – Food resources: World food problems, changes caused by agriculture and overgrazing, effects of modern agriculture, fertilizer-pesticide problems, water logging, salinity, case studies. – Energy resources:

UNIT – II

Ecosystems: Concept of an ecosystem. – Structure and function of an ecosystem . Producers,

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				P. Rajesh	

Regulation	BR23				
II Year I Semester	Course Code: 23AC3T01	L	T	P	C
		2	0	0	--
Course Title:	ENVIRONMENTAL SCIENCE				

consumers and decomposers – Energy flow in the ecosystem – Ecological succession – Food chains, food webs and ecological pyramids – Introduction, types, characteristic features, structure and function of the following ecosystem

a. Forest ecosystem.
b. Grassland ecosystem
c. Desert ecosystem
d. Aquatic ecosystems (ponds, streams, lakes, rivers, oceans, estuaries)

Biodiversity and Its Conservation: Introduction and Definition: genetic, species and ecosystem diversity – Bio-geographical classification of India – Value of biodiversity: consumptive use, Productive use, social, ethical, aesthetic and option values – Biodiversity at global, National and local levels.

UNIT – III

Environmental Pollution: Definition, Cause, effects and control measures of: Air Pollution, Water pollution, Soil pollution, Marine pollution, Noise pollution, Thermal pollution, Nuclear hazards

UNIT – IV

Social Issues and the Environment: From Unsustainable to Sustainable development – Urban problems related to energy – Water conservation, rain water harvesting, watershed management – Resettlement and rehabilitation of people; its problems and concerns.

Case studies – Environmental ethics: Issues and possible solutions – Climate change, global warming, acid rain, ozone layer depletion, nuclear accidents and holocaust. Case Studies – Wasteland reclamation. – Consumerism and waste products. – Environment Protection Act. – Air (Prevention and Control of Pollution) Act. – Water (Prevention and control of Pollution) Act – Wildlife Protection Act – Forest Conservation Act – Issues involved in enforcement of environmental legislation – Public awareness.

UNIT – V

Human Population And The Environment: Population growth, variation among nations. Population explosion – Family Welfare Programmes. – Environment and human health – Human Rights – Value Education – HIV/AIDS – Women and Child Welfare – Role of information Technology in Environment and human health.

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				P. Rajesh	

BONAMVENKATACHALAMAYYAENGINEERINGCOLLEGE,
ODALAREVU-533 210, Andhra Pradesh, India
Autonomous

Regulation	BR23				
II Year I Semester	Course Code: 23AC3T01	L	T	P	C
		2	0	0	--
Course Title:	ENVIRONMENTAL SCIENCE				

Textbooks:

1. ErachBharucha.Text book of Environmental Studies for Undergraduate Courses,Universities Press (India) Private Limited, 2019.
2. Palaniswamy, Environmental Studies, 2 e, Pearson education, 2014.
3. S.AzeemUnnisa, Environmental Studies, Academic Publishing Company, 2021.
4. K.RaghavanNambiar, "Text book of Environmental Studies for Undergraduate Courses as per UGC model syllabus", SciTech Publications (India), Pvt. Ltd, 2010.

Reference Books:

1. Deeksha Dave and E Sai Baba Reddy, Textbook of Environmental Science, 2/e, Cengage Publications, 2012.
2. M.Anji Reddy, "Textbook of Environmental Sciences and Technology", BS Publication, 2014.
3. J.P. Sharma, Comprehensive Environmental studies, Laxmi publications, 2006.
4. J. Glynn Henry and Gary W. Heinke, Environmental Sciences and Engineering, Prentice Hall of India Private limited, 1988.
5. G.R. Chatwal, A Text Book of Environmental Studies, Himalaya Publishing House, 2018.
6. Gilbert M. Masters and Wendell P. Ela, Introduction to Environmental Engineering and Science, 1/e, Prentice Hall of India Private limited, 1991.

Online Learning Resources:

- https://onlinecourses.nptel.ac.in/noc23_hs155/preview
- https://www.edx.org/learn/environmental-science/rice-university-ap-r-environmentalscience-part-3-pollution-and-resources?index=product&objectID=course-3a6da9f2-d84c-4773-8388-1b2f8f6a75f2&webview=false&campaign=AP%C2%AE+Environmental+Science%3A+Part+3%3A+Pollution+and+Resources&source=edX&product_category=course&placement_url=https%3A%2F%2Fwww.edx.org%2Flearn%2Fenvironmental-science
- http://ecoursesonline.iasri.res.in/Courses/Environmental%20Science-I/Data%20Files/pdf/lec07.pdfhttps://www.youtube.com/watch?v=5QxxnYfqQ3k

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				P.Rajesh	