

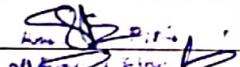
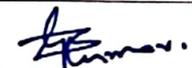
**BONAM VENKATA CHALAMAYYA ENGINEERING COLLEGE (A)**  
**DEPARTMENT OF ELECTRICAL AND ELECTRONICS ENGINEERING**

**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	 Dept. of EEE & EPE University College of Engineering JNT University Kakinada KAKINADA-533 002
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.	

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



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

**COMPLEX VARIABLES AND NUMERICAL METHODS**

(Electrical and Electronics Engineering)

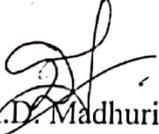
**Course Objectives:**

- 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:**

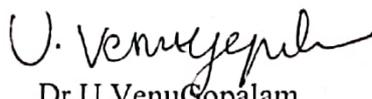
Students are able to

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 5

  
A.D. Madhuri  
(Chairman-BOS)

Dr. G.V.S.R Deekshitulu  
(University Nominee)

  
Dr. T.S.R. Murthy  
(Subject Expert)

  
Dr. U. Venu Gopalam  
(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<sup>rd</sup> and 3/8<sup>th</sup> 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.

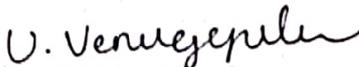
**UNIT- IV:****Series expansions and Residue Theorem:**

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  $\int_0^{2\pi} f(\cos\theta, \sin\theta)d\theta$ .

  
A.D. Madhuri  
(Chairman-BOS)

Dr. G V.S.R Deckshitulu  
(University Nominee)

  
Dr. T.S.R. Murthy  
(Subject Expert)

  
Dr. U. VenuGopalam  
(Subject Expert)

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



**UNIT-V:**

**Conformal mapping:**

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

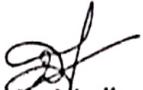
Translation, rotation, inversion and bilinear transformation – fixed point – cross ratio – properties - invariance of circles and cross ratio – determination of bilinear transformation mapping 3 given points.

**Textbooks:**

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

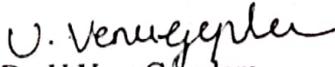
**Reference Books:**

1. Erwin Kreyszig, Advanced Engineering Mathematics, 10th Edition, Wiley – India.
2. Michael Greenberg, Advanced Engineering Mathematics, 2<sup>nd</sup> 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

  
A.D. Madhuri  
(Chairman-BOS)

Dr. G V.S.R Deekshitulu  
(University Nominee)

  
Dr. T.S.R. Murthy  
(Subject Expert)

  
Dr. U. VenuGopalam  
(Subject Expert)

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

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)

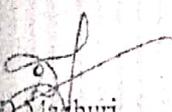
**Course Objectives:**

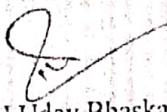
The learning objectives of this course are to:

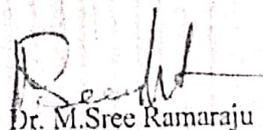
- > To help the students appreciate the essential complementary between 'VALUES' and 'SKILLS' to ensure sustained happiness and prosperity which are the core aspirations of all human beings.
- > To facilitate the development of a Holistic perspective among students towards life and profession as well as towards happiness and prosperity based on a correct understanding of the Human reality and the rest of existence. Such holistic perspective 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.

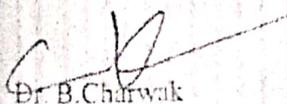
**Course Outcomes: Students are able to**

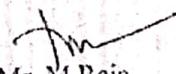
CO Number	Course Outcome	Blooms Level
CO1	Define the terms like Natural Acceptance, Happiness and Prosperity	BL1,2
CO2	Identify one's self, and one's surroundings (family, society nature).	BL1,2
CO3	Apply what they have learnt to their own self in different day-to-day settings in real life	BL3
CO4	Relate 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

  
A.D. Manaburi  
(Chairman-BOS)

  
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

NITI Introduction to Value Education (6 lectures and 3 tutorials for practice session)

Lecture 1: Right Understanding, Relationship and Physical Facility  
(Holistic Development 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

Lecture 4: 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

NIT 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 the body.

Lecture 8: Distinguishing between the Needs of the self and the body

Tutorial 4: Practice Session PS4 Exploring the difference of Needs of  
self and body.

Lecture 9: The body as an Instrument of the  
self

Lecture 10: Understanding Harmony in the  
self

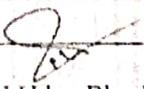
Tutorial 5: Practice Session PS5 Exploring Sources of Imagination in the  
self

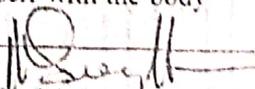
Lecture 11: Harmony of the self with the body

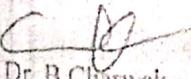
Lecture 12: Programme to ensure self-regulation and Health

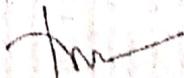
Tutorial 6: Practice Session PS6 Exploring Harmony of self with the body

  
Dr. D. Madhuri  
(Chairman-BOS)

  
Dr. N. Uday Bhaskar  
(University Nominee)

  
Dr. M. Sree Kumaraju  
(Subject Expert)

  
Dr. B. Charwak  
(Subject Expert)

  
Mr. M. Raja  
(Member)

III

Harmony in the Family and Society (6 lectures and 3 tutorials for practice session)  
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

IV Harmony in the Nature/Existence (4 lectures and 2 tutorials for practice session)

Lecture 19: Understanding Harmony in the Nature

Lecture 20: Interconnectedness, self-regulation and Mutual Fulfilment among the 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.

V Implications of the Holistic Understanding - a Look at Professional Ethics (6 lectures 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 and Universal Human Order

Lecture 26: Competence in Professional Ethics

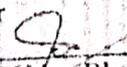
Tutorial 13: Practice Session PS13 Exploring Humanistic Models in Education

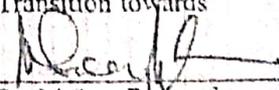
Lecture 27: Holistic Technologies, Production Systems and Management Models-Typical Case Studies

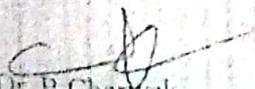
Lecture 28: Strategies for Transition towards Value-based Life and Profession

Tutorial 14: Practice Session PS14 Exploring Steps of Transition towards Universal Human Order

  
A.D. Madhuri  
(Chairman-BOS)

  
Dr. N. Uday Bhaskar  
(University Nominee)

  
Dr. M. Sree Ramaraju  
(Subject Expert)

  
Dr. B. Charwak  
(Subject Expert)

  
Mr. M. Raja  
(Member)

Practice Sessions for UNIT I – Introduction to Value  
Education PS1 Sharing about Oneself

PS2 Exploring Human Consciousness PS3 Exploring  
Natural Acceptance

Practice Sessions for UNIT II – Harmony in the  
Human Being PS4 Exploring the difference of Needs  
of self and body

PS5 Exploring Sources of Imagination in  
the self PS6 Exploring Harmony of self  
with the body

Practice Sessions for UNIT III –  
Harmony in the Family and Society PS7  
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

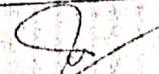
Practice Sessions for UNIT V – Implications of the Holistic Understanding – a Look at  
Professional Ethics

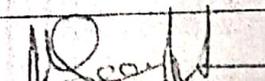
PS12 Exploring Ethical Human Conduct

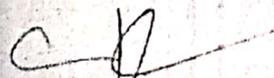
PS13 Exploring Humanistic Models in Education

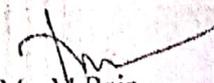
PS14 Exploring Steps of Transition towards Universal Human Order

  
A.D. Madhuri  
Chairman-BOS

  
Dr. N. Uday Bhaskar  
(University Nominee)

  
Dr. M. Sree Ramaraju  
(Subject Expert)

  
Dr. B. Charwak  
(Subject Expert)

  
Mr. M. Raja  
(Member)

Text Books:

The Textbook

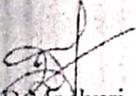
R R Gaur, R Asthana, G P Bagaria, *A Foundation Course in Human Values and Professional Ethics*, 2nd Revised Edition, Excel Books, New Delhi, 2019. ISBN 978-93-87034-47-1

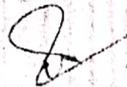
The Teacher's Manual

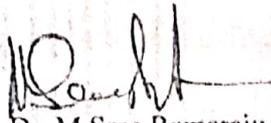
R R Gaur, R Asthana, G P Bagaria, *Teachers' Manual for A Foundation Course in Human Values and Professional Ethics*, 2nd Revised Edition, Excel Books, New Delhi, 2019. ISBN 978-93-87034-53-2

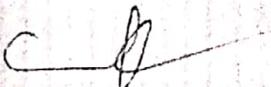
Reference Books:

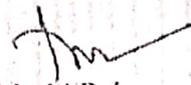
1. *Jeevan Vidya: Ek Parichaya*, A Nagaraj, Jeevan Vidya Prakashan, Amarkantak, 1999.
2. *Human Values*, A.N. Tripathi, New Age Intl. Publishers, New Delhi, 2004.
3. *The Story of Stuff* (Book).
4. *The Story of My Experiments with Truth* - by Mohandas Karamchand Gandhi
5. *Small is Beautiful* - E. F. Schumacher.
6. *Slow is Beautiful* - Cecile Andrews
7. *Economy of Permanence* - J C Kumarappa
8. *Bharat Mein Angreji Raj* - Pandit Sunderlal
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)

  
A.D. Madhuri  
Chairman-BOS

  
Dr. N. Uday Bhaskar  
(University Nominee)

  
Dr. M. Sree Ramaraju  
(Subject Expert)

  
Dr. B. Charwak  
(Subject Expert)

  
Mr. M. Raja  
(Member)

Code of Conduct:

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

Tutorial hours are to be used for practice sessions.

While analyzing and discussing the topic, the faculty mentor's role is in pointing to essential elements and help in sorting them out from the surface elements. In other words, help the students explore important or critical elements.

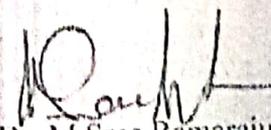
During the discussions, particularly during practice sessions (tutorials), the mentor encourages the student to connect with one's own self and do self-observation, self-reflection and self-exploration.

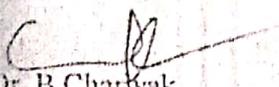
Real life scenarios may be used to initiate discussion. The student is encouraged to take up "ordinary" situations rather than "extra-ordinary" situations. Such observations and their analyses are shared and discussed with other students and faculty mentor, in a group sitting. Tutorials (experiments or practicals) are important for the course. The difference is that the laboratory is everyday life, and practicals are where you behave and work in real life. Depending on the nature of topics, worksheets, home assignments and/or activity are included. The practice sessions (tutorials) would also provide support to a student in performing actions commensurate to his/her beliefs. It is intended that this would lead to development of commitment, namely behaving and working based on basic human values. It is recommended that the content be placed before the student as it is, in the form of a basic foundation course, without including anything else or excluding any part of this content. Additional content may be offered in separate courses. This course is to be taught by faculty from every teaching department, not excluding any one department.

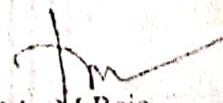
Teacher preparation with a minimum exposure to at least one 8-day Faculty Development Program on Universal Human Values is deemed essential.

  
A.D. Madhuri  
Chairman-BOS

  
Dr. N. Uday Bhaskar  
(University Nominee)

  
Dr. M. Sree Ramaraju  
(Subject Expert)

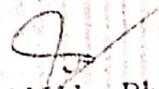
  
Dr. B. Charvak  
(Subject Expert)

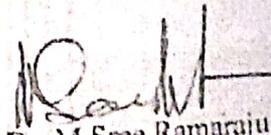
  
Mr. M. Raja  
(Member)

Resources:

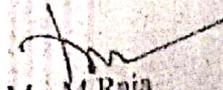
1. <https://fdp-si.aicte-india.org/UHV-II%20Class%20Notes%20&%20Handouts/UHV%20Handout%201-Introduction%20to%20Value%20Education.pdf>
2. <https://fdp-si.aicte-india.org/UHV-II%20Class%20Notes%20&%20Handouts/UHV%20Handout%202-Harmony%20in%20the%20Human%20Being.pdf>
3. <https://fdp-si.aicte-india.org/UHV-II%20Class%20Notes%20&%20Handouts/UHV%20Handout%203-Harmony%20in%20the%20Family.pdf>
4. <https://fdp-si.aicte-india.org/UHV%201%20Teaching%20Material/D3-S2%20Respect%20July%202023.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%202023-25%20Ethics%20v1.pdf>

  
D. Madhuri  
(Member-BOS)

  
Dr. N. Uday Bhaskar  
(University Nominee)

  
Dr. M. Sree Ramaraju  
(Subject Expert)

  
Dr. B. Charvak  
(Subject Expert)

  
Mr. M. Raja  
(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,  $\nabla \cdot D = \rho_V$ ), 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 Poisson'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 ( $\nabla \cdot \vec{B} = 0$ ), 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

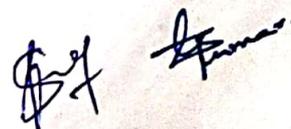
#### Self and mutual inductance: (BTL-4)

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.



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

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



**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, 7<sup>th</sup> Edition, 2006.
3. "Electromagnetic Field Theory" by U.A.Bhakshi, Late A.V Bhakshi, Technical Publications, 3<sup>rd</sup> edition, 2023.

**Reference Books:**

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

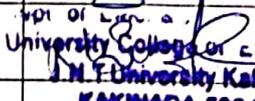
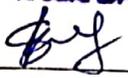
CO1: Understand the concepts of electric fields and potentials using Coulomb's law & Gauss law/ solve Laplace's or Poisson's equations for various electric charge distributions.

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

Department of Electrical and Electronics Engineering, Bonam Venkata Chalamayya Engineering College  
 Associate Professor  
 Dept of Elec. & Electronics Engg.  
 University College of Engineering  
 J. N. T University Kakinada  
 KAKINADA-533 003

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.

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

Associate Professor  
 Dept of Elec & Electronics Engg.  
 University College of Engineering  
 J. N. T University Kakinada  
 KAKINADA-833 023

**Textbooks:**

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

**Reference Books:**

1. Network Analysis, M. E. Van Valkenburg, 3<sup>rd</sup> Edition, PHI, 2019.
2. Network Theory, N. C. Jagan and C. Lakshminarayana, 1<sup>st</sup> Edition, B. S. Publications, 2012.
3. Circuits and Networks Analysis and Synthesis, A. Sudhakar, Shyam Mohan S. Palli, 5<sup>th</sup> 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, 7<sup>th</sup> 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.

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-531 001

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

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/ $\Delta$ ,  $\Delta$ /Y,  $\Delta$ / $\Delta$ , open  $\Delta$  – third harmonics in phase voltages – Parallel operation – three winding transformers – off load and on load tap changing transformers – Scott connection.

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

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

**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, 5th edition
2. Electrical Machinery Fundamentals by Stephen J Chapman McGraw Hill edition 2011.
3. Generalized Theory of Electrical Machines by Dr. P S Bimbhra, 7<sup>th</sup> 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.

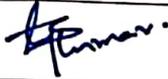
**Online Learning Resources:**

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.	

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.

## 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**

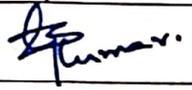
Any 10 of the following experiments are to be conducted:

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.**

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-833 003

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

## 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 through equivalent 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:**

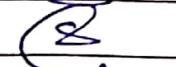
1. <https://ems-iitr.vlabs.ac.in/List%20of%20experiments.html>

**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 DC Machines.  
 CO3: Determine the performance characteristics of DC machines using different testing methods.  
 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.**

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  
 BAPKINADA-533 002

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



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.

<i>D. Ramaiah</i>	<i>Jimson</i>	<i>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



**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.

**Deque:** Introduction to deque (double-ended queues), Operations on deque 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.

<i>N. R. K. R. K.</i>	<i>Jimson</i>	<i>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

**Computer Science & Engineering Dep.,  
BVC Engineering College, Odalarevu  
East Godavari Dist. A.P. 533 210**



**HONAM VENKATACHALAMAYYA ENGINEERING COLLEGE,**  
**ODALAREVU-533 210, Andhra Pradesh, India**  
**Autonomous**

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

**Course Objectives:**

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

**Course Outcomes:**

COs	Statements	Blooms Level
CO1	Grasp multi-disciplinary nature of environmental studies and various renewable and non-renewable resources.	L2
CO2	Understand flow and bio-geo-chemical cycles and ecological pyramids.	L2
CO3	Understand various causes of pollution and solid waste management and related preventive measures.	L2
CO4	Understand the rain water harvesting, watershed management, ozone layer depletion and wasteland reclamation.	L2
CO5	Illustrate the causes of population explosion, value education and welfare programmes.	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.

Ch. Sivanarayana HOD & BOS, Department of Civil Engineering, BVCEC Odalarevu.	Dr. V. Lakshmi, Professor, Department of Civil Engineering UCEK, JNTU Kakinada. (University Nominee)	Dr. A. Murali Krishna, Professor, Department of Civil Engineering, IIT Tirupathi.	Dr. D. Raghuram Kadali Assistant Professor Department of Civil Engineering NIT Warangal.	Er. P. Rajesh, Sr. Engineer (I) SDVVL Survey & Construction, Kakinada	Mr. P. Chakradhar Prasad Asst. Professor Department of Civil Engineering DNR College of Engineering Technology
				P. Rajesh	



**BONAM VENKATACHALAMAYYA ENGINEERING COLLEGE,**  
**ODALAREVU - 533 210, Andhra Pradesh, India**  
**Autonomous**

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

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

- Forest ecosystem.
- Grassland ecosystem
- Desert ecosystem
- 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.

Ch. Sivanarayana HOD & BOS, Department of Civil Engineering, BVCEC Odalarevu.	Dr. V. Lakshmi, Professor, Department of Civil Engineering UCEK, JNTU Kakinada. (University Nominee)	Dr. A. Murali Krishna, Professor, Department of Civil Engineering, IIT Tirupathi.	Dr. B. Raghuram Kadali Assistant Professor Department of Civil Engineering NIT Warangal.	Er. P. Rajesh, Sr. Engineer (P) SDVVL Survey & Constructions, Kakinada	Mr. P. Chakradhar Prasad Asst. Professor Department of Civil Engineering DNR College of Engineering Technology
				P. Rajesh	



**BONAM VENKATACHALAMAYYA ENGINEERING COLLEGE.**  
**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. Erach Bharucha. 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. Raghavan Nambiar. "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://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%20AF+Environmental+Science+Part+3%3A+Pollution+and+Resources&source=edX&product\\_category=course&placement\\_url=https%3A%2F%2Fwww.edx.org%2Flearn%2Fenvironmental-science](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%20AF+Environmental+Science+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-1/Data%20Files/pdf/lec07.pdfhttps://www.youtube.com/watch?v=5QxxuVfuQ3k>

Ch Sivanarayana HOD & BOS, Department of Civil Engineering, BVCEC Odalarevu.	Dr. V Lakshmi, Professor, Department of Civil Engineering UCEK, JNTU Kakinada. (University Nominee)	Dr. A. Murali Krishna, Professor, Department of Civil Engineering, IIT Tirupathi.	Dr. B. Raghuram Kadali Assistant Professor Department of Civil Engineering NIT Warangal.	Er. P. Rajesh, Sr. Engineer (P) SDVVL Survey & Constructions, Kakinada	Mr. P. Chakradhar Prasad Asst. Professor Department of Civil Engineering DNR College of Engineering Technology
				P. Rajesh	