GRBT-20

I YEAR

COURSE STRUCTURE, SYLLABUS & BOS MINUTES

DEPARTMENT OF MECHANICAL ENGINEERING

Godavari institute of Engg& Technology

Approved By AICTE NAAC'A^{+}' Grade Recognized by UCG,U/Sec.2(f)&12(B) Permanent Affiliation by JNTUK

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GRBT- 20 COURSE STRUCTURE
Mechanical Engineering
B. Tech. I Semester

S. No	Category	Course Code	Subject Title	Hours per Week			Credits	Internal	External	Total
				L	T	P				
1	BSC		Mathematics-I	3	0	0	3	30	70	100
2	BSC		Engineering Chemistry	3	0	0	3	30	70	100
3	HSMC		Communicative English-I	3	0	0	3	30	70	100
4	ESC		Engineering Graphics	1	0	4	3	30	70	100
5	ESC		Basic Electrical and Electronics Engineering	3	0	0	3	30	70	100
6	BSC		Engineering Chemistry Laboratory	0	0	3	1.5	50	50	100
7	ESC		Basic Electrical and Electronics Engineering Laboratory	0	0	3	1.5	50	50	100
8	ESC		Basic Engineering Workshop	0	0	3	1.5	50	50	100
			Total	**13**	**0**	**13**	**19.5**	**300**	**500**	**800**
	BSC =7.5	**ESC=9**	**HSMC=3**							

B. Tech. II Semester

S. No	Category	Course Code	Subject Title	Periods per Week			Credits	Internal	External	Total
				L	T	P				
1	BSC		Mathematics-II	3	0	0	3	30	70	100
2	BSC		Engineering Physics	3	0	0	3	30	70	100
3	ESC		Fundamentals of Computer Programming	3	0	0	3	30	70	100
4	ESC		Engineering Mechanics	3	0	0	3	30	70	100
5	ESC		Material Science and Metallurgy	3	0	0	3	50	50	100
6	BSC		Engineering Physics Laboratory	0	0	3	1.5	50	50	100
7	ESC		Fundamentals of Computer Programming Laboratory	0	0	3	1.5	50	50	100
8	HSMC		Communicative English Laboratory	0	0	3	1.5	50	50	100
9	MC		Environmental Studies	2	0	0	0	100*	–	–
			Total	**17**	**0**	**9**	**19.5**	**320**	**480**	**800**
	BSC=7.5	**ESC=10.5**	**HSMC=1.5**							

Regulation GRBT-20	Godavari Institute of Engineering & Technology (Autonomous)	I B.Tech. (1 Semester)			
Course Code XXXXXXX	MATHEMATICS - I (ALL BRANCHES)				
Teaching	Total contact hours - 48	L	T	P	C
Prerequisite(s): Types of matrices, Differentiation and Integration.		3	0	0	3

Course Objective:

- This course will illuminate the students in the concepts of calculus and linear algebra.
- To equip the students understand advanced level mathematics to develop the confidence and ability to handle real world problems and their applications.

Course Outcomes:

On Completion of the course, the students will be able to-	
CO1:	Transform the knowledge of solving system of linear equations using matrices.
CO2:	Evaluate nature of the Quadratic form.
CO3:	Acquire the knowledge maxima and minima of function of several variables
CO4:	Evaluate multiple integrals and their applications
CO5:	Understand and apply vector derivatives and vector integration theorems.

Syllabus:

Unit I: Matrix Operations and Solving Systems of Linear Equations **10 hrs**
Rank of a matrix by echelon form, solving system of linear homogeneous and non-homogeneous equations – Gauss elimination method, Eigen values and Eigen vectors and their properties, Cayley-Hamilton theorem (without proof), finding inverse and power of a matrix by Cayley-Hamilton theorem.

Unit II: Quadratic forms **8 hrs**
Quadratic forms and nature of the Quadratic forms, reduction of Quadratic form to canonical form by diagonalisation and orthogonal transformation.

Unit III: Partial differentiation and Applications **10 hrs**
Partial derivatives, total derivatives, chain rule, Homogeneous functions and Euler's theorem, change of variables, Jacobians, maxima and minima of functions of two variables, method of Lagrange multipliers.

Unit IV: Multiple Integrals and Applications **10 hrs**
Evaluation of double integrals (Cartesian and polar coordinates) and triple integrals, change of variables, change of order of integration, Finding areas and volumes.

UNIT V: Vector Calculus **10 hrs**
Scalar and vector point functions, Curl, Gradient and Divergence, directional derivative, Irrotational and Solenoidal vector fields. Line integral, Work done, Area, Surface and volume integrals. Greens, Stokes and Gauss Divergence theorems (without proof).

DEPARTMENT OF MECHANICAL ENGINEERING

4 Years B.Tech. (Mechanical Engineering) Course Structure: (2019-20)

MATHEMATICS-I

Text books:

1. B. S. Grewal, Higher Engineering Mathematics, 44/e, Khanna Publishers, 2017.
2. Erwin Kreyszig, Advanced Engineering Mathematics, 10/e, John Wiley & Sons, 2011.

Reference Books:

1. R. K. Jain and S. R. K. Iyengar, Advanced Engineering Mathematics, 3/e, Alpha Science International Ltd., 2002.
2. George B. Thomas, Maurice D. Weir and Joel Hass, Thomas Calculus, 13/e, Pearson Publishers, 2013.
3. T.K.V.Iyenger, et.al., Engineering Mathematics, Volume-III, .Chand Publicatiobns, 2018.
4. Glyn James, Advanced Modern Engineering Mathematics, 4/e, Pearson publishers, 2015.

Web Links:

1. https://nptel.ac.in/courses/111105121/
2. https://nptel.ac.in/courses/111105035/

CO-PO Mapping:

(1: Slight [Low]; 2: Moderate[Medium]; 3: Substantial[High], '-' : No Correlation)

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	3	2	2	2	-	-	-	-	-	-	-	1
CO2	3	2	2	2	-	-	-	-	-	-	-	1
CO3	3	2	2	2	-	-	-	-	-	-	-	1
CO4	3	2	2	2	-	-	-	-	-	-	-	1
CO5	3	2	2	2	-	-	-	-	-	-	-	1

Regulation GRBT-20	Godavari Institute of Engineering & Technology (Autonomous)	I B.Tech I SEM			
Course Code	ENGINEERING CHEMISTRY (Common to All Branches)				
Teaching	Total contact hours–48h	L	T	P	C
Prerequisite(s): Knowledge of theoretical and experimental concepts from Intermediate level, Application of Chemistry theory and calculations required for the course.		3	0	0	3

Course Objective:

To acquaint the students with soft and hard water types and softening methods, to introduce the basic concepts of electrochemical cells and photovoltaic cells and to familiarize the students with engineering materials, their properties and applications.

Course Outcomes:

On Completion of the course, the students will be able to-	
CO1	Understand the removal techniques of hardness of water
CO2	Distinguish the fuel cells and batteries
CO3	Identify different control techniques of corrosion
CO4	Understand the concepts of plastics and rubbers
CO5	Analyze the importance of nano materials

Syllabus

UNIT –I

WATER TECHNOLOGY

Hardness of water, Determination of hardness by EDTA Method - Boiler troubles - scale and sludge-priming and foaming (reasons and its preventions), specifications for drinking water by World Health Organization (WHO) standards, municipal water treatment or portable water treatment, softening of water - Lime soda process, zeolite and ion-exchange processes, Desalination of brackish water, reverse osmosis (RO) and electro dialysis.

UNIT – II

ENERGY SOURCES AND APPLICATIONS

Electrochemical cells- Galvanic cells, Electrode potential, determination of single electrode potential –Nernst's equation, reference electrodes, hydrogen and calomel electrodes – electrochemical series and its applications – primary cell, dry or Leclanche cell – secondary cell, lead acid storage cell, nickel-cadmium cell – lithium ion batteries (Lithium-MnO_2) – fuel cell, hydrogen-oxygen fuel cell, Solar cell and its applications.

UNIT – III

CORROSION ENGINEERING

Corrosion: Definition – theories of corrosion, chemical and electro chemical corrosion – pitting corrosion, differential aeration corrosion, passivity, factors affecting corrosion – nature of the metal and nature of the environment.

Corrosion Controlling Methods: Sacrificial and Impressed current cathodic protection, Metallic coatings (anodic, cathodic), applying of metallic coatings - galvanizing and tinning, metal cladding, electroplating, organic surface coatings, paints (constituents and their functions).

UNIT – IV

POLYMERS

Introduction to polymers and monomers,polymerization and its types,mechanism of addition polymerization, compounding and fabrication of plastics, differences between thermoplastic and thermo setting resins, Preparation, properties and uses of Urea-Formaldehye, PVC andpolyethylene, Natural Rubber-vulcanization of rubber, Preparation, properties and uses of BUNA-S and BUNA-N Rubber, conducting polymers and its applications.

UNIT – V

NANO MATERIALS

Introduction to Nano materials, Nano structured materials-nano rods,nano sheets, Quantum dots,Methods of preparationsby bottom up and top-down approaches -ball milling,sol-gel methods, Characterization of nanoparticles by XRD, SEM andTEM (includes basic principle of TEM), Applications of nanomaterials.

Text Books:

1. P.C. Jain and M. Jain, Engineering Chemistry, 15/e, Dhanapat Rai & Sons, (2014).
2. B.K. Sharma, Engineering Chemistry, Krishna Prakasham, (2014).

References:

1. Sashi Chawla, A Textbook of Engineering Chemistry, Dhanapath Rai and sons, (2003)
2. B.S Murthy and P. Shankar, A Text Book of NanoScience and NanoTechnology, University Press (2013).
3. S.S. Dara, A Textbook of Engineering Chemistry, S.Chand& Co, (2010)
4. V. Raghavan, A Material Science and Engineering, Prentice-Hall India Ltd, (2004).
5. N. Krishna Murthy and Anuradha, A text book of Engineering Chemistry, Murthy Publications (2014).

Regulation GRBT-20	Godavari Institute of Engineering & Technology (Autonomous)	I B.Tech. I Semester			
Course Code	COMMUNICATIVE ENGLISH-1 (Common to all Branches)				
Teaching	Total Contacthours-48	L	T	P	C
Prerequisite(s): Learner should be equipped with basic language and communication skills like Reading, Writing, Listening and Speaking		3	0	0	3

Course Objectives: This course aims to

- Focus on appropriate reading strategies for comprehension of various academic texts and authentic materials.
- Impart effective strategies for good writing, to summarize information and practice writing essays.
- Improve communication in both professional and social life
- Demonstrate Language efficiency in career building
- Provide the knowledge of grammatical structures, vocabulary and encourage their appropriate use in speech and writing.

Course Outcomes:

On Completion of the course, the students will be able to	
CO1:	Develop effective reading strategies
CO2:	Demonstrate writing skills that are required for professional development and use graphic elements for communication
CO3:	Apply grammatical skills and vocabulary effectively in speech and writing
CO4:	Display language efficacy in tune with subjective knowledge
CO 5:	Use required language along with contextual vocabulary and grammar structures

UNIT-I

READING: Detailed Study: Exploration- "A Proposal to Girdle the Earth (Excerpt)" by Nellie Bly, from English All Round: Communication Skills for Under Graduate Learners-1 by Orient Black Swan. **Non-Detailed Study**: "Deliverance" by Prem chand from **Individual Society,** Pearson Publications **GRAMMAR:** Verbs, nouns, adjectives and adverbs; nouns: countable and uncountable; singular and plural forms. Simple question forms – Wh-questions; Word order in sentences. **VOCABULARY: Technical Vocabulary (GRE Model)-20 words.** Content words and function words; Word forms **WRITING SKILLS:** Paragraph Writing-Beginnings and endings of paragraphs - introducing a topic- structure and types of paragraph.

UNIT-II

READING: Detailed Study: On Campus - An excerpt from "The District School as It Was by One Who Went to It" by Warren Burton from English All Round: Communication Skills for Under Graduate Learners-1 by Orient Black Swan **Non-Detailed Study:** "Bosom Friend" by Hira Bansode from **Individual Society**, Pearson Publications **GRAMMAR:** Use of articles and zero article; prepositions. **VOCABULARY: Technical Vocabulary (GRE Model)-20 words.** Linkers, sign posts and transition signals. **WRITINGSKILLS:** Punctuation. Summarizing an oral or written text.

UNIT-III

READING: Detailed Study: Working Together - The Future of Work? (Adopted from web resources)From English All Round: Communication Skills for Under Graduate Learners-1 by Orient Black Swan. **Non-Detailed Study**"Shakespeare's Sister" by Virginia Woolf from **Individual Society,** Pearson Publications **GRAMMAR:** Tense and aspect; direct and indirect speech, reporting verbs for academic purposes.**VOCABULARY: Technical Vocabulary (GRE Model)-20 words.** Prefixes and Suffixes. **WRITING SKILLS:** Rephrasing what is read; avoiding redundancies and repetitions.

UNIT–IV

READING: Detailed Study: Fabric of Change- H. G. Wells and the Uncertainties of Progress by Peter J. Bowler from English All Round: Communication Skills for Under Graduate Learners-1by Orient Black Swan. **Non-Detailed:**"Telephone Conversation" by Wole Soyinka from **Individual Society**, Pearson Publications **GRAMMAR:** Quantifying expressions - adjectives and adverbs; comparing and contrasting; degrees of comparison. **VOCABULARY: Technical Vocabulary (GRE Model)-20 words.** Use of antonyms and homophones. Cloze encounters **WRITINGSKILLS:** Information transfer; describe, compare, contrast, and identifying significance/trends based on information provided in figures/charts/graphs/tables – Sensible writing, Defining and classifying.

UNIT – V

READING: Detailed Study: Tools for Life -Leaves from the Mental Portfolio of a Eurasian by Sui Sin Far from English All Round: Communication Skills for Under Graduate Learners-1 by Orient Black Swan. **Non-Detailed**: "Still I Rise" by Maya Angelou from **Individual Society**, Pearson Publications. **GRAMMAR:** Reading comprehension- framing right answers and editing the given text. **VOCABULARY: Technical Vocabulary (GRE Model)-20 words.** Idioms and Phrases. **WRITING SKILLS**: Writing structured essays on specific topics using suitable claims and evidences.

Text Books:

1. **Detailed Study**: ENGLISH ALL ROUND: Communication Skills for Under Graduate Learners- Published by Orient Black swan Pvt Ltd
2. **Non-detailed Study**: **Individual Society**, Pearson Publications

Reference books:

1. **Pathways: Listening, Speaking and Critical Thinking-1** byRebecca Tarver Chase, Becky Tarver and Henley, ELT; 2nd Edition, 2018.
2. **InfoTech English** by Maruthi Publications.

Regulation GRBT-20	Godavari Institute of Engineering & Technology (Autonomous)	I B.Tech. I Sem (1st Semester)			
Course Code	**Engineering Graphics (Common to CE, ME, CSE(AI&ML),CSE(Cyber Security), Automobile, Mining and Petroleum Engineering)**				
Teaching	Total contact hours- 60	L	T	P	C
Prerequisite(s): Aptitude to Learn and Basic Geometry		1	0	4	3

Course Objectives:

- To highlight the significance of universal language of engineers.
- To impart basic knowledge and skills required to prepare engineering drawings.
- To impart knowledge and skills required to draw projections of solids in different contexts.
- To visualize and represent the pictorial views with proper dimensioning and scaling. Course

Course Outcomes:

On Completion of the course, the students will be able to-	
CO1:	Apply principles of drawing to represent dimensions of an object.
CO2:	Outline the polygons and engineering curves.
CO3:	Illustrate projections of points, lines, planes and solids.
CO4:	Illustrate the 3D views through isometric views.
CO5:	Create the isometric views and orthographic views

Syllabus:

UNIT-I

POLYGONS: Constructing regular polygons by general methods, inscribing and describing polygons on circles.

CURVES: Parabola, Ellipse and Hyperbola by general methods, cycloids, involutes.

UNIT-II

ORTHOGRAPHIC PROJECTIONS: Horizontal plane, vertical plane, profile plane, importance of reference lines, projections of points in various quadrants, projections of lines, lines parallel either to one of the reference planes (HP,VP or PP)

PROJECTIONS OF STRAIGHT LINES: Inclined to both the planes, determination of true lengths, angle of inclination and traces- HT, VT.

UNIT-III

PROJECTIONS OF PLANES: Regular planes perpendicular/parallel to one plane and inclined to the other reference plane; inclined to both the reference planes.

UNIT-IV

PROJECTIONS OF SOLIDS: Prisms, Pyramids, Cones and Cylinders with the axis inclined to one of the planes.

UNIT-V

ISOMETRIC VIEWS: Conversion of isometric views to orthographic views; Conversion of orthographic views to isometric views.

COMPUTER AIDED DESIGN: Drawing practice using Auto CAD, Creating 2D & 3D drawings of objects using Auto CAD

Note: In the End Examination there will be no question from CAD.

Text Books:

1. Engineering Drawing by N.D. Butt, Chariot Publications.
2. Engineering Drawing by Agarwal&Agarwal, Tata McGraw Hill Publishers.

Reference Books:

1. Engineering Drawing by K.L.Narayana& P. Kannaiah, Scitech Publishers.
2. Engineering Graphics for Degree by K.C. John, PHI Publishers.
3. Engineering Graphics by PI Varghese, McGrawHill Publishers.
4. Engineering Drawing + AutoCad – K.Venugopal, V. Prabhu Raja, New Age.

Regulation GRBT-20	Godavari Institute of Engineering & Technology (Autonomous)	I B.Tech			
Course Code	**BASIC ELECTRICAL AND ELECTRONICS ENGINEERING (Common for Mech, CE, AME, PET, MM, ECE, EEE)**				
Teaching	Total contact hours-45	L	T	P	C
Prerequisite(s): Basics of Physics		3	0	0	3

Course Objectives:

1. To learn the basic principles of electrical law's and analysis of networks.
2. To understand the principle of operation and construction details of DC machines.
3. To learn the principle of operation and constructional details of transformers, alternator and induction motors.
4. To study the operation of PN junction diode, half wave, full Wave rectifiers and OP-AMPS
5. To study operation of PNP and NPN transistors and various amplifiers.

Course Outcomes:

On Completion of the course, the students will be able to-	
CO1:	Analyze the various electrical networks
CO2:	Understand the operation of DC machines,3-point starter and conduct the Swinburne's Test.
CO3:	Analyze the performance of transformer, operation of 3-phase alternator and 3-phase induction motors.
CO4:	Analyze the operation of half Wave, full wave rectifiers, op-amps.
CO5:	Explain the single stage CE amplifier and concept of feedback amplifier.

Syllabus:

UNIT –I

Introduction to Electrical Circuits

Basic definitions, Electrical circuit elements (R, L and C), Ohm's Law, Series & Parallel circuits, Kirchhoff's Laws, Simple problems.

UNIT- II

DC Generator

Generator-Principle of Operation, Construction, EMF equation, Classification, O.C.C, internal and external characteristics of shunt generator, Applications.

UNIT- III

DC Motor

Motor-principle of operation, Torque equation, Classification Speed Control Methods, Operation of 3 point starter, Applications.

UNIT –IV

Rectifiers & Linear Integrated Circuits

PN junction diodes, diode applications - Half wave and bridge rectifiers. Characteristics of operation amplifiers (OP-AMP) - application of OP-AMPS (inverting, non-inverting, integrator and differentiator).

UNIT –V

Transistors

PNP and NPN junction transistor, transistor as an amplifier, single stage CE amplifier, frequency response of CE amplifier, concepts of feedback amplifier.

Text books:

1. Principles of Electrical and Electronics Engineering by V.K.Mehta, S.Chand& Co.
2. Introduction to Electrical Engineering – M.S Naidu and S. Kamakshaiah, TMH Publ.
3. Electronic Devices and Circuits, R.L. Boylestad and Louis Nashelsky, 9th edition, PEI/PHI 2006.
4. Electrical Technology by Surinder Pal Bali, Pearson Publications.
5. Electrical Circuit Theory and Technology by John Bird, Routledge Taylor &Francis Group

Reference Books:

1. Basic Electrical Engineering by M.S.Naidu and S.Ka1nakshiah, TMH Publications
2. Fundamentals of Electrical Engineering by Rajendra Prasad, PHI Publications, 2th edition
3. Basic Electrical Engineering by Nagsarlcar, Sukhija, Oxford Publications,2nd edition
4. Industrial Electronics by GK. Mittal, PHI

Web Links:

1. www.electrical4u.com
2. www.nptel.com

Regulation GRBT-20	Godavari Institute of Engineering and Technology (Autonomous)	I B.Tech I SEM			
CourseCode	ENGINEERING CHEMISTRY LABORATORY (Common to All Branches)				
Teaching	Total contact hours - 45	L	T	P	C
Prerequisite(s): Basic knowledge of Engineering Chemistry Applications		0	0	3	1.5

COURSE OBJECTIVES

To familiarize the students with the basic concepts of Engineering Chemistry Lab, training the students on how to handle the instruments and to demonstrate the digital and instrumental methods of analysis.

COURSE OUTCOMES

On Completion of the course, the students will be able to-	
CO1:	Explain the functioning of the instruments such as pH, Conductivity and Potentiometric meters
CO2:	Determine the total hardness of water
CO3:	Perform various Redox titrations
CO4:	Preparation of polymers
CO5:	Compare viscosities of different oils

LIST OF EXPERIMENTS

1. Determination of strength of an acid by pH metric method
2. Determination of Fe (II) in Mohr's salt by potentiometric method
3. Determination of conductance by conductometric method
4. Determination of Hardness of a ground water sample
5. Determination of chromium (VI) in potassium dichromate
6. Determination of strength of $KMnO_4$ using standard Oxalic acid solution
7. Determination of Zinc by EDTA method
8. Preparation of Urea-Formaldehyde resin
9. Estimation of active chlorine content in Bleaching powder
10. Estimation of sodium hydroxide with HCl

Demonstration Experiments

1. Determination of viscosity of a liquid
2. Determination of surface tension of a liquid
3. Estimation of vitamin-C

TEXT BOOKS

1. Mendham J, Denney RC, Barnes JD, Thosmas M and Sivasankar B Vogel's Quantitative Chemical Analysis 6/e, Pearson publishers (2000).
2. N.K Bhasin and Sudha Rani Laboratory Manual on Engineering Chemistry 3/e, Dhanpat Rai Publishing Company (2007).

Regulation GRBT-20	Godavari Institute of Engineering & Technology (Autonomous)	I B.Tech			
Course Code	**BASIC ELECTRICAL AND ELECTRONICS ENGINEERING LABORATORY (Common for Mech, CE, AME, PET, MM, ECE, EEE)**				
Teaching	Total contact hours - 30	L	T	P	C
Prerequisite(s): Basics of Physics		0	0	3	1.5

Course Objectives:

1. To verify the Kirchhoff's laws & Ohm's law
2. To calculate the efficiencies of transformers, DC motors, Three-phase Induction Motor
3. To plot the characteristics of PN junction diode & operational amplifier
4. To plot the characteristics of Transistor

Course Outcomes:

On Completion of the course, the students will be able to-	
CO1:	Analyze the various electrical networks
C02:	Understand the operation or DC machines,3 -point starter and conduct the Swinburne's Test.
C03:	Analyze the performance oi transformer, operation of 3-phase alternator and 3-phase induction motors.
C04:	Analyze the operation of half Wave, full wave rectifiers, op-amps.
C05:	Explain the single stage CE amplifier and concept of feedback amplifier.

List of Experiments:

1. Verification of Kirchhoff's laws
2. Verification of Ohm's laws
3. Study of various wiring components (wires, switches, fuses, sockets, plugs, Lamp holders, lamps etc. their uses and ratings)
4. Measurement of current, voltage, power in R-L-C series circuit excited by single phase supply
5. Verification of voltage & current relations in Star & delta connections
6. Swinburne's test on a DC shunt machine.
7. Transistor common base characteristics
8. Speed control of D.C. Shunt motor by Armature Voltage control and Field flux control method
9. Efficiency and regulation of a single phase transformer by direct loading method.
10. Brake test on a three phase induction motor

11. PN junction Diode characteristics a). Forward bias b).Reverse bias. (Cut in voltage & Resistance calculations)
12. Zener diode characteristics
13. Half wave rectifier
14. Full wave Rectifier
15. Transistor common emitter characteristics.

CO-PO Mapping:
(1: Slight [Low]; 2: Moderate[Medium]; 3: Substantial[High], '-' : No Correlation)

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	2	3	2	1	3	-		2		1		1
CO2	2	3			3			2	3			1
CO3	2	3	-		3			2	3			1
CO4	2	1	2		3			2	2			1
CO5	2	1			3			2		1		1

Regulation GRBT-20	Godavari Institute of Engineering & Technology (Autonomous)	I B.Tech. I Sem (1st Semester)			
Course Code	**Basic Engineering Workshop (Common to CE, ME, Automobile, Mining and Petroleum Engineering)**				
Teaching	Total contact hours–48	L	T	P	C
Prerequisite(s): Aptitude to learn .		0	0	3	1.5

Course Objective:

- Provide insight into utilization of various tool in carpentry, fitting, tin smithy, black smithy and house wiring.

Course Outcomes:

On Completion of the course, the students will be able to-	
CO1:	Experiment with various basic house wiring techniques.
CO2:	Develop basic prototype in the trade of tin smithy such as square tray and open scoop.
CO3:	Design v-fitting and square fitting in the trade of fitting
CO4:	Making square rod and L-bend from the round rod in black smithy
CO5:	Build various prototype like T lap joint, dovetail joint, cross lap etc. in the trade of carpentry.

List of Experiments:

Note: At least two exercises should be done from each trade.

1. Carpentry
   1. T-Lap Joint
   2. Cross Lap Joint
   3. Dovetail Joint
   4. Mortise and Tenon Joint
2. Fitting
   1. Vee Fit
   2. Square Fit
   3. Half Round Fit
   4. Dovetail Fit
3. Black Smithy
   1. Round rod to Square
   2. S-Hook
   3. Round Rod to Flat Ring
   4. Round Rod to Square headed bolt

4. Tin Smithy
   1. Taper Tray
   2. Square Box without lid
   3. Open Scoop
   4. Funnel
5. House wiring
   1. Ordinary bulb connection
   2. Staire case connection
   3. Parallel connection
   4. Series connection

Workshop Manual by P.Kannaiah & K.L.Narayana- Scitech Publishers

Regulation GRBT-20	**Godavari Institute of Engineering & Technology (Autonomous)**	I B.Tech. (II Semester)			
Course Code XXXXXXX	**MATHEMATICS - II** (ALL BRANCHES)				
Teaching	Total contact hours - 48	L	T	P	C
Prerequisite(s): Fundamentals of differentiation and interation.		3	0	0	3

Course Objective:

- To enlighten the learners in the concept of differential equations and multivariable calculus.
- To furnish the learners with basic concepts and techniques at plus two level to lead them into advanced level by handling various real world applications

Course Outcomes:

On Completion of the course, the students will be able to-	
CO1:	Solve first order differential equations.
CO2:	Solve higher order differential equations with constant coefficients.
CO3:	Apply the knowledge of approximating and find the roots of polynomial and transcendental equation in practical engineering problems.
CO4:	Understand numerical differentiation and integration.
CO5:	Apply the Knowledge of different algorithms for approximating the solution of ordinary differential equations in practical Engineering problems.

Syllabus:

UNIT I: Mean value theorems, First Order differential equations & Applications **10 hrs**
Rolle's theorem, Lagrange's mean value theorem, Cauchy mean value theorem.
Formation of differential equation, Solutions of Exact and Reducible to exact, Linear and Bernoulli differential equations. Applications: Newton's law of cooling, Law of natural growth and decay, Orthogonal trajectories.

UNIT II: Higher Order Differential Equations and Applications **10 hrs**
Solutions of higher order differential equations with constant coefficients. Solutions of Non-homogeneous equations of higher order with constant coefficients with RHS term of the form $e^{ax}, sinax, cosax$, Polynomials in $x, e^{ax}V(x), xV(x)$. Method of variation of parameters. Applications: Mass spring system and L-C-R Circuit problems.

Unit III: Solutions of Algebraic, Transcendental Equations and Interpolation **8 hrs**
Introduction, Bisection method, Regula-Falsi method and Newton-Raphson method.
Interpolation: Newton's Forward and backward formulae, Lagrange's interpolation.

UNIT IV: Numerical Differentiation and Integration **10 hrs**
Numerical differentiation: Forward and backward difference formulae. Numerical integration: Trapezoidal rule and Simpson's 1/3rd and 3/8 rule.

UNIT V: Numerical Solution of Ordinary Differential Equations **10 hrs**
Solutions of ordinary differential equations- Taylor's series, Euler method, Modified Euler method, Runge-Kutta method (Second and fourth order) for first initial value problems.

MATHEMATICS – II

Text books:

1. Erwin Kreyszig, Advanced Engineering Mathematics, 10/e, John Wiley & Sons, 2011.
2. B. S. Grewal, Higher Engineering Mathematics, 44/e, Khanna publishers, 2017.

Reference Books:

1. Michael Greenberg, Advanced Engineering Mathematics, 2/e, Pearson, 2018
2. George B. Thomas, Maurice D. Weir and Joel Hass, Thomas Calculus, 13/e, Pearson Publishers, 2013.
3. T.K.V.Iyenger, et.al., Engineering Mathematics, Volume-I, S.Chand Publicatiobns, 2016.
4. R. K. Jain and S. R. K. Iyengar, Advanced Engineering Mathematics, 3/e, Alpha Science International Ltd., 2002.

Web Links:

1. https://nptel.ac.in/courses/111108081/
2. https://nptel.ac.in/courses/111105093/

CO-PO Mapping:

(1: Slight [Low]; 2: Moderate[Medium]; 3: Substantial[High], '-' : No Correlation)

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	3	3	2	2	-	-	-	-	-	-	-	1
CO2	3	3	3	2	-	-	-	-	-	-	-	1
CO3	3	3	3	2	-	-	-	-	-	-	-	1
CO4	3	3	3	2	-	-	-	-	-	-	-	1
CO5	3	3	2	2	-	-	-	-	-	-	-	1

DEPARTMENT OF MECHANICAL ENGINEERING

4 Years B.Tech. (Mechanical Engineering) Course Structure: (2019-20)

Regulation GRBT-20	Godavari Institute of Engineering & Technology (Autonomous)	I B.Tech			
Course Code	ENGINEERING PHYSICS (For All Non-Circuital Branches like Mechanical, CE, AME, PET, Mining etc)				
Teaching	Total Contact Hours – 48h	L	T	P	C
		3	0	0	3

Course Objective

Physics Curriculum is re-oriented to the needs of all the branches of graduate engineering courses that serve as a transit to understand specific advanced topics.

Course Outcomes:

On Completion of the course, the students will be able	
CO1:	To impart knowledge of physical optical phenomenon like Interference, Diffraction and polarization involving design of optical instruments with higher resolution. To explain the concept of dielectric constant and polarization in dielectric materials and summarize Gauss's law in the presence of dielectrics
CO2:	To assess the electromagnetic wave propagation in different media and its power and explain the working principle of optical fibers and its classification based on refractive index profile and mode of propagation with their applications. To classify the energy bands of semiconductors and outline the properties of n-type and p-type semiconductors.
CO3:	To study the basic Quantum mechanics, interpretation of the direct and indirect band gap in semiconductors and identify the type of semiconductor using Hall effect.
CO4:	To interpret dielectric loss, Lorentz field and Claussius - Mosotti relation and classify the magnetic materials based on susceptibility and their temperature dependence. To apply the Gauss' Theorem for divergence and Stokes' theorem for curl and evaluate Maxwell's displacement current and correction in Ampere's law.

Syllabus:

UNIT –I

WAVE OPTICS **10h**

INTERFERENCE: Introduction - Principle of Superposition- Interference in thin films (reflected light) - Newton's Rings – Engineering Applications

DIFFRACTION: Introduction – Types of Diffractions – Fraunhofer Single slit Diffraction (Quantitative) – Double Slit - N slits/Grating (Qualitatively) – Grating Formula – Rayleigh's Criterion for resolving power of grating

POLARIZATION: Introduction - Types of Polarization (plane, circular, elliptical) – Production of polarized light by reflection, refraction and double refraction - Nicol's Prism - Half wave and Quarter wave plates

UNIT –II **8h**

Laser

Introduction – Characteristics of laser – Spontaneous and Stimulated emissions of radiation – Einstein's coefficients – Pumping schemes – Population inversion – Three level system and meta stable state - Lasing Schemes – Ruby Laser – He-Ne laser - Applications of lasers.

Fiber Optics

Introduction - Principle and structure of Optical Fibers - Acceptance angle - Numerical Aperture - Classification of optical fibers based on Refractive index profile and modes – Applications for the optical fibers

UNIT –III **10h**

Acoustics:

Introduction – Reverberation – Reverberation time– Sabine's formula (Derivation using growth and decay method) – Basic requirements for the acoustically good halls - Absorption coefficient and its determination – Factors affecting acoustics of buildings and their remedial measures

Ultrasonics:

Introduction - Properties of ultrasonics - Production by magnetostriction and piezoelectric methods – Detection - Acoustic grating - Non-Destructive Testing – pulse echo system through transmission and reflection modes

UNIT –IV **10h**

Crystallography: Introduction - Space lattice, Basis, Unit Cell – Bravais Lattice – crystal systems (3D) – coordination number - packing fraction of SC, BCC & FCC - Miller indices – separation between successive (hkl) planes.

X-ray diffraction: Introduction - Bragg's law - X-ray Diffractometer – Miller Indices – Planes - crystal structure determination by rotating crystal (Laue's) and powder methods

UNIT –V **10h**

DIELECTRICS PROPERTIES

Introduction - Electric polarization - Dielectric polarizability, Susceptibility and Dielectric constant- Types of dielectric polarizations – Electronic, Ionic, Orientational & Space (Qualitatively) – Internal Field (or) Local field in solids - Claussius-Mosotti equation – Ferroelectrics (Qualitatively)

MAGNETIC PROPERTIES

Introduction - Magnetic dipole moment-Magnetization-Magnetic susceptibility and permeability- Origin of permanent magnetic moment -Classification of Magnetic materials (Dia, Para, Ferro/Ferri/Antiferro) with regard to temperature and field - Weiss ferromagnetic domain theory (qualitative)-Hysteresis-soft and hard magnetic materials-Ferrites

Text books

1. M. R. Srinivasan, "Engineering Physics", New Age International Publishers, 2011.
2. D. Thirupathi Naidu, M. Veeranjaneyulu, "Engineering Physics", Techno Series, 2019.
3. P. K. Palanisamy, "Applied Physics", Sci-tech Publications.
4. A.J.Decker, "Solid State Physics", Mac Millan.
5. M. N. Avadhanlu, P. G. Kshirasagar "A Text book of Engineering Physics", S. Chand Publications, 2017.

Reference Books

1. Principles of Physics by Resnick, Halliday, and Walker, Printice Hall Publications
2. Gerd Keiser "Optical Fiber Communications"- 4/e, Tata Mc GrawHill ,2008
3. S.M.Sze "Semiconductor devices-Physics and Technology"-Wiley,2008
4. H. K. Malik and A. K. Singh "Engineering Physics", McGraw Hill Publishing Company Ltd, 2018.

Web Links:

1. https://www.britannica.com/science/interference-physics
2. http://vlab.amrita.edu/index.php -Virtual Labs, Amrita University

Regulation GRBT-20	Godavari Institute of Engineering & Technology (Autonomous)	I B.Tech II Sem.			
CourseCode	**Fundamentals of Computer Programming** (Common to Mech, Min, Civil, AME, EEE, PET)				
Teaching	Totalcontacthours-48	L	T	P	C
Prerequisite(s): Basic knowledge of Mathematics, Logical Ability		3	0	0	3

Course Objective(s):

- Exposure to problem solving through programming
- Basic concepts of C-programming language
- Involves a lab component which is designed to give the student hands-on experience with the concepts.

Course Outcomes:

After successful completion of this course, a student will be able to-

CO-1: Obtain the knowledge about different languages used in computer programming and basic terminology used in the computer programming.

CO-2: Write algorithm, flow chart, and structure of C program and make use of different C tokens inside C program.

CO-3: Develop program by using Control structure, different looping and Jump statement.

CO-4: Implement applications of Array, Structure and String inside the program.

CO-5: Obtain knowledge about accessing the memory in the program and also to develop the program by using different types of function calls.

UNIT-1

Introduction to Computers: Generations,CPU, Memory, I/o Devices

Introduction to Computer Programming: Computer Languages: Machine level, Assembly level and High-level language.

Introduction to Problem Solving: Algorithm, Pseudo code and Flowchart.

UNIT-2

C Fundamentals: Structure of a C-program,C-character set, C Tokens:variables, constants, identifiers, data types and sizes, operators, Preprocessor.

I/O Functions: Header files, Standard I/O library functions-formatted I/O functions.

Decision making statements: simple if, if-else, nested if-else, else-if ladder, switch-case statements and sample programs.

Iterative Statements: for, while, do-while. Jump Statements-break, continue, goto

UNIT-3

Introduction to Arrays&Strings

Arrays- Declaration, initialization, storing and accessing elements of 1-D, 2-D and multi-dimensional arrays.

Array Applications:addition, multiplication, transpose, symmetry of a matrix.

Strings: Declaration, initialization, reading and writing characters into strings, string operations, character and string manipulation functions.

UNIT-4: Pointers,Functions & Storage Classes

Pointers: Introduction to pointers, defining a pointer variable, Pointer to Pointer, Examples of pointers, using pointers in expressions, pointers and arrays.

Functions: declaration, definition, prototype, function call, return statement, types of functions, parameter passing methods, and function recursion.

Storage Classes: Auto, Static, Extern and Register

UNIT-5: Structures &Unions

Structure and Union: Declaration, initialization, storing and accessing elements by using structure and union.

Text Books

1. Problem Solving and Programming Concepts, Maureen Sprankle and Jim Hubbard, Pearson, 9th Edition.
2. "Programming in ANSI C" by E.Balagurusamy,McGraw Hill Publications.
3. "Programming in C" by Ashok N. Kamthane, 2/e Pearson, 2013.
4. "The C – Programming language" B.W.Kernighan, Dennis M. Ritchie.PHI.
5. "Let Us C", 12th Edition by Yashavant P. Kanetkar online in India.

Reference Books

1. Programming in C by Ajay Mittal, Pearson.
2. Programming with C, Bichkar, Universities press.
3. Programming in C, ReemaThareja, OXFORD.

CO-PO Mapping:

(1: Slight [Low]; 2: Moderate[Medium]; 3: Substantial[High], '-' : No Correlation)

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	2	-	-	-	-	-	-	-	-	-	-	-
CO2	-	-	2	-	-	-	-	-	-	-	-	-
CO3	-	-	-	-	3	-	-	-	-	-	-	-
CO4	-	-	-	-	3	-	-	-	-	-	-	-
CO5	-	-	-	-	3	-	-	-	-	-	-	-

Regulation GRBT-20	Godavari Institute of Engineering & Technology (Autonomous)	I B.Tech. II Sem (2^{nd} semester)			
Course Code	**Engineering Mechanics (Common to CE, ME, Automobile, Mining, and Petroleum Engineering)**				
Teaching	Total contact hours-55	L	T	P	C
Prerequisite(s): Engineering Physics		2	1	0	3

Course Objectives:

- To learn the resolution and composition of system of forces.
- To understand the analytical and graphical methods for analysis of static equilibrium of rigid bodies.
- To learn the concept of centroid, center of gravity, moment of inertia.
- To learn kinematic and kinetic analysis of rigid bodies.
- To learn application of work energy and impulse momentum principles to rigid body motion.

Course Outcomes:

On Completion of the course, the students will be able to-	
CO1:	Carry out composition of system of forces.
CO2:	Analyse rigid bodies in static equilibrium condition under system of forces including friction.
CO3:	Determine centre of gravity and moment of inertia of simple and composite planar, solid sections.
CO4:	Carry out dynamic analysis of rigid bodies under translation, rotation and plane motion.
CO5:	Apply work energy and impulse momentum principles to rigid body motion.

Syllabus:

UNIT – I

INTRODUCTION TO ENGINEERING MECHANICS – BASIC CONCEPTS, SYSTEMS OF FORCES: Coplanar Concurrent Forces – Components in Space – Resultant – Moment of Force and its Application – Couples and Resultant of Force Systems. Introduction**,** limiting friction and impending motion, coulomb's laws of dry friction, coefficient of friction, cone of friction.

UNIT- II

EQUILIBRIUM OF SYSTEMS OF FORCES: Free Body Diagrams, Equations of Equilibrium of Coplanar Systems, Spatial Systems for concurrent forces. Lamis Theorm, Graphical method for the equilibrium of coplanar forces, Converse of the law of Triangle of forces, converse of the law of polygon of forces condition of equilibrium.

UNIT – III

CENTROID: of simple figures (from basic principles) – Centroids of Composite Figures.

CENTRE OF GRAVITY: Centre of gravity of simple body (from basic principles), centre of gravity of composite bodies, pappus theorem.

AREA MOMENTS OF INERTIA: Definition – Polar Moment of Inertia, Transfer Theorem, Moments of Inertia of Composite Figures, Products of Inertia, Transfer Formula for Product of Inertia. Mass **MOMENT OF INERTIA:** Moment of Inertia of Masses, Transfer Formula for Mass Moments of Inertia, mass moment of inertia of composite bodies.

UNIT –I V

KINEMATICS: Rectilinear and Curvilinear motions – Velocity and Acceleration – Motion of Rigid Body – Types and their Analysis in Planar Motion.

KINETICS: Analysis as a Particle and Analysis as a Rigid Body in Translation – Central Force Motion – Equations of Plane Motion – Fixed Axis Rotation – Rolling Bodies.

UNIT – V

WORK – ENERGY METHOD: Equations for Translation, Work-Energy Applications to Particle Motion, Connected System-Fixed Axis Rotation and Plane Motion.Impulse momentum method.

Text Books:

1. Engineering Mechanics statics and dynamics: A Nelson, McGraw Hill publications.
2. Engineering Mechanics, S S Bhavikatti, New Age International Publications.

References:

1. Engineering. Mechanics - S.Timoshenko & D.H.Young., 4thEdn - , McGraw Hill publications.
2. Engineering Mechanics: Basudeb Bhattacharyya, Oxford University Press
3. Engineering Mechanics: statics and dynamics – I.H.Shames, – Pearson Publ.
4. Engineering Mechanics, Tayal A.K. (2010) Umesh Publications
5. Engineering Mechanics,Khurmi R.S. (2010), S. Chand & Co.

Useful Web-links : http://nptel.ac.in/courses.php
http://mit.espe.edu.ec/courses/mechanical-engineering/

Regulation GRBT-20	Godavari Institute of Engineering & Technology (Autonomous)	I B.Tech. II Sem (2nd semester)			
Course Code	**Material Science and Metallurgy (Common to ME, Mining, Petroleum Engineering)**				
Teaching	Total contact hours-55	L	T	P	C
Prerequisite(s): Engineering Physics and Engineering Chemistry		3	0	0	3

Course Objective:

To understand the basic fundamentals of Material science and Physical metallurgy. The basic concepts to be taught will help for the improvement, proper selection and effective utilization of materials which is essential to satisfy the ever increasing demands of the society.

Course Outcomes:

On Completion of the course, the students will be able to-	
CO1:	Demonstrate the knowledge of science and fundamentals of materials.
CO2:	Describe the regions of stability of phases that occur in the alloy systems.
CO3:	Classify steels and cast Irons with applications.
CO4:	Select heat treatment methods and non-ferrous materials.
CO5:	Explain the concept of ceramics and composites.

Syllabus:

UNIT – I

STRUCTURE OF METALS AND CONSTITUTION OF ALLOYS: Bonds in Solids–Metallic bond - crystallization of metals, grain and grain boundaries, effect of grain boundaries on the properties of metal / alloys – determination of grain size. Necessity of alloying, types of solid solutions, Hume Rotherys rules, intermediate alloy phases, and electron compounds.

UNIT –II

EQUILIBRIUM DIAGRAMS: Experimental methods of construction of equilibrium diagrams, Isomorphousalloy systems, equilibrium cooling and heating of alloys, Lever rule, coring miscibility gaps, eutectic systems, congruent melting intermediate phases, peritectic reaction. Transformations in the solid state – allotropy, eutectoid, peritectoid reactions, phase rule, relationship between equilibrium diagrams and properties of alloys. Study of important binary phase diagrams of Cu-Ni-, Al-Cu, Bi-Cd, Cu-An, Cus-Sn and Fe-Fe3C.

UNIT –III

CAST IRON AND STEELS: Classification of Cast Iron-Structure and properties of White Cast iron, Malleable Cast iron, grey cast iron, Spheriodal graphite cast iron, Alloy cast irons.

Classification of steels- structure and properties of plain carbon steels, Low alloy steels, Hadfield manganese steels, tool and die steels.

UNIT – IV

HEAT TREATMENT OF ALLOYS: Effect of alloying elements on Fe-Fe3C system, Annealing, normalizing, Hardening, TTT diagrams, tempering, Hardenability, surface - hardening methods, Age hardening treatment, Cryogenic treatment of alloys.

NON-FERROUS METALS AND ALLOYS: Structure and properties of copper and its alloys, Aluminium and its alloys, Titanium and its alloys. Magnesium and its alloys

UNIT – V

CERAMICS: Crystalline ceramics, glasses, cermets, abrasive materials nano-materials.

COMPOSITES: Definition, properties and applications of the above. Classification of composites- particle – reinforced materials, fiber reinforced materials, metal ceramic mixtures, metal – matrix composites and C – C composites various methods of manufacturing of composites.

Text Books:

1. Introduction to Physical Metallurgy - Sidney H. Avener–McGrawHill
2. Material science and Engineering - V. Rahghavan

References:

1. Material Science and Metallurgy – Dr.V.D.kodgire.
2. Materials Science and engineering - Callister&Baalasubrahmanyam
3. Material Science for Engineering students – Fischer – Elsevier Publishers
4. Introduction to Material Science and Engineering – Yip-Wah Chung CRC Press
5. Material Science and Metallurgy – A V K Suryanarayana – B S Publications
6. Material Science and Metallurgy – U. C. Jindal – Pearson Publication
7. Material Science and Metallurgy for Engineers-Kodgire-Everest Publishing House

Useful Web-links : http://nptel.ac.in/courses.php
http://mit.espe.edu.ec/courses/mechanical-engineering/

Regulation GRBT-20	Godavari Institute of Engineering & Technology (Autonomous)	I B.Tech			
Course Code	ENGINEERING PHYSICS LABORATORY (For All Non-Circuital Branches like Mechanical, CE, AME, PET, Mining etc)				
Teaching	Total contact hours- 48	L	T	P	C
		0	0	3	1.5

Course Objectives:

On Completion of the course, the students will be able	
CO1:	To handle optical instruments like microscope and spectrometer, determine thickness of a hair/paper with the concept of interference and to estimate the wavelength and resolving power of different colors using diffraction grating
CO2:	To demonstrate the importance of dielectric material in storage of electric field energy in the capacitors and plot the intensity of the magnetic field of circular coil carrying current with varying distance
CO3:	To evaluate the acceleration due to gravity using compound pendulum
CO4:	To determine the moment of inertia using Fly wheel

List of Physics Experiments

1. Determination of the radius of curvature of the lens by Newton's ring method
2. Determination of wavelength by plane diffraction grating method
3. Resolving power of a grating
4. Magnetic field along the axis of a circular coil carrying current
5. Measurement of resistance with varying temperature
6. To determine the acceleration due to gravity using compound pendulum
7. Rigidity modulus of material of a wire-dynamic method (torsion pendulum)
8. Moment of inertia by Flywheel
9. To determine the V-I characteristics of P-N Junction diode
10. To determine the V-I characteristics Zener diode

Additional Experiments

1. Determine the thickness of the fiber using wedge shape method
2. To verify the laws of vibration using sonometer
3. To determine the resistivity of semiconductor by Four probe method
4. To determine the carrier concentration and Hall coefficient
5. To determine the energy gap of a semiconductor

References:

1. S. Balasubramanian, M.N. Srinivasan "A Text book of Practical Physics"- S Chand Publishers, 2017

Web link:

1. http://vlab.amrita.edu/index.php -Virtual Labs, Amrita University

Regulation GRBT-20	Godavari Institute of Engineering & Technology (Autonomous)	I B.TechII Sem.			
CourseCode	**Fundamentals of Computer Programming Lab** (Common to Mech, Min, Civil, AME, EEE, PET)				
Teaching	Totalcontacthours-36	L	T	P	C
Prerequisite(s): Basic knowledge of Mathematics, Logical Ability		0	0	3	1.5

Course Objective(s):

- To provide exposure to problem solving through programming.
- To train the student to the basic concepts of C-programming language.
- The course involves a lab component which is designed to give the student hands-on experience with the concepts.

Course Outcome(s):

After successful completion of this course, a student will be able to-

CO-1: Obtain the knowledge about different languages used in computer programming and basic terminology used in the computer programming.

CO-2: Write algorithm, flow chart, and structure of C program and make use of different C tokens inside C program.

CO-3: Develop program by using Control structure, different looping and Jump statement.

CO-4: Implement applications of Array, Structure and String inside the program.

CO-5: Obtain knowledge about accessing the memory in the program and also to develop the program by using different types of function calls.

Programs:

1. Write a C Program to
   a) Calculate the area of triangle using the formula
      Area = (s (s-a) (s-b) (s-c)) 1/2, where s= (a+b+c)/2
   b) To find the largest of three numbers using ternary operator.
   c) To swap two numbers with and without temporary variable.

2. Write a C program that perform the following operations:
   a) Reading and writing a complex number
   b) Addition of two complex numbers

3. Write a C program to
   a) Find the roots of a quadratic equation.
   b) Take two integer operands and one operator form the user,Performs the operation and then prints the result. (Consider the operators +,-,*, /, % and use Switch Statement)

4. Write a C Program toprint the following patterns
   a) Floyd's triangle
   b) Pyramid

DEPARTMENT OF MECHANICAL ENGINEERING

4 Years B.Tech. (Mechanical Engineering) Course Structure: (2019-20)

5. Write a C program to
   a) Check whether the given number is Armstrong number or not.
   b) Check whether the given number is palindrome or not.
   c) A Fibonacci sequence is defined as follows: the first and second terms in the sequence are 0 and 1. Subsequent terms are found by adding the preceding two terms in the sequence. Write a C program to generate the first n terms of the sequence.
   d) Generate all the prime numbers between 1 and n, where n is a value supplied by the user.

6. Write a C Program to print the multiplication table of a given number n up to a given value, where n is entered by the user.

7. Write a C program to
   a) Examples which explore the use of structures, union and other user defined variables.
   b) Declare a structure for calculating the percentage achieved by 3 students, byconsidering the structure elements as name, pin no, mark1, mark2, mark3.

8. Write the C programs for the following using arrays
   a) Matrix addition
   b) Matrix Multiplication

9. Write C Program for perfoming the following string operations
   i. length of a string
   ii. reversea string
   iii. append a string to another string
   iv. compare two strings

10. Write a C Programs for the following string operations with and without using the built in functions
    a) To reverse a string using pointers.
    b) To concatenate two strings by using pointer.

11. Write a C program to find the factorial of a given integer using function recursion.

12. Write C programs to
    a) Find the area of triangle by using call by value and call by reference concepts.
    b) Pointer based function to exchange value of two integers using passing by address.

Regulation GRBT-20	Godavari Institute of Engineering & Technology (Autonomous)	I B.Tech. IISemester			
Course Code	COMMUNICATIVE ENGLISH LAB				
Teaching hours	TotalContacthours–48	L	T	P	C
Prerequisite(s) Learner should be equipped with Basic Language and Communication Skills like, Listening and Speaking which ensure Good Pronunciation and Ease in Communication		0 -	0	3	1.5

Course Objectives: This course aims to

- Adopt activity-based teaching-learning methods to ensure effective learning both in the classroom and laboratory sessions.
- Facilitate effective listening skills for better comprehension of academic lectures and English spoken by native speakers
- Improve speaking skills through participation in activities such as role plays, discussions and structured talks/oral presentations
- Explore the important language needs of the learner
- Build Language efficacy in both speaking and listening context

Course Outcomes: On Completion of the course, the students will be able to

CO1:	Learn to communicate in English
CO2:	Comprehend native speaker's accent.
CO3:	Speak appropriately in real life situations
CO4:	Display public speaking skills in the required context
CO5:	Handle different communicative situations

UNIT 1: BASIC AURAL AND ORAL SKILLS

Listening: Identifying the topic, the context and specific pieces of information by listening to short audio texts and answering a series of questions. Asking and answering general questions on familiar topics such as home, family, work, studies and interests; introducing oneself and other. **Speaking:** Phonetics-Accent and pronunciation

UNIT 2: CONVERSATIONAL SKILLS

Listening: Listening to audio texts, framing question in order to find out the gist of the unknown text. **Speaking:** Discussion in pairs/ small groups on specific topics followed by short structured talks

UNIT 3: LANGUAGE IN USE

Listening: Listening for global comprehension and summarizing. **Speaking:** Asking for Clarifications, Inviting others, Expressing Sympathy, Congratulating, Apologizing, Advising, Suggesting, Agreeing and Disagreeing.

UNIT 4: LANGUAGE APPPLICATOIN

Listening: Making predictions while listening to conversations/ transactional dialogues; listening to video and narrating the theme. **Speaking:** word stress-di-syllabic words, Poly-Syllabic words -Role plays for practice of conversational English in academic contexts (formal and informal) - asking for and giving information/directions.

UNIT 5: INTERPRETATIONS

Listening: TED Talks – understanding the summary. **Speaking:** Formal oral presentations on topics from academic contexts and technical back ground. Giving formal explanations.

Lab Manual: INTERACT by Orient Black Swan

SOFTWARE: Cambridge –UNLOCK-2, English In Mind, Pronunciation Power, English grammar in Use

Reference Books:

1. English Pronunciation in use- Mark Hancock, Cambridge University Press
2. English Phonetics and Phonology-Peter Roach, Cambridge University Press.

GRBT-20	...stitute of Engineering & Technology (Autonomous)	I B.Tech II SEM			
CourseCode	ENVIRONMENTAL SCIENCE (Common to All Branches)				
Teaching	Totalcontacthours–32h	L	T	P	C
Prerequisite(s): KnowledgeofEnvironment Science		2	0	0	0

Course Objective: To bring in the students an awareness on environment, to understand the importance of protecting natural resources, ecosystems for future generations and study the causes for pollution due to the day-to-day activities of human life, to save earth from the interventions by the engineers.

Course Outcomes:

On Completion of the course, the students will be able to-	
CO1:	Gain a higher level of personal involvement and interest in understanding and solving environmental problems.
CO2:	Comprehend environmental problems from multiple perspectives with emphasis on human modern lifestyles and developmental activities
CO3:	Demonstrate knowledge relating to the biological systems involved in the major global environmental problems of the 21st century
CO4:	Recognize the interconnectedness of human dependence on the earth's ecosystems
CO5:	Influence their society in proper utilization of goods and services.

Syllabus:

UNIT – I

MULTIDISCIPLINARY NATURE OF ENVIRONMENTAL STUDIES

Definition, Scope and Importance – Need for Public Awareness.

NATURAL RESOURCES : Renewable and non-renewable Energy 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.

UNIT – II

ECOSYSTEMS, BIODIVERSITY, AND ITS CONSERVATION

Concept of an ecosystem – Structure and function of an ecosystem – Producers, consumers and decomposers – 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: Definition: genetic, species and ecosystem diversity – Value of biodiversity: consumptive use, Productive use, social, ethical, aesthetic and option values – Biodiversity at global, National and local levels – India as a mega-diversity nation – Hot-sports of biodiversity – Threats to biodiversity: habitat loss, poaching of wildlife,

man-wildlife conflicts – Conservation of biodiversity: In-situ and Ex-situ conservation of biodiversity.

UNIT – III
ENVIRONMENTAL POLLUTION AND SOLID WASTE MANAGEMENT
Definition, Cause, effects and control measures of:Air Pollution, Water pollution, Soil pollution, Marine pollution, Noise pollution, Thermal pollution, Nuclear hazards
SOLID WASTE MANAGEMENT:Causes,effects and control measures of urban and industrial wastes – Role of an individual in prevention of pollution – Pollution case studies – Disaster management: floods, earthquake, cyclone and landslides.

UNIT – IV
SOCIAL ISSUES AND THE ENVIRONMENT
Urban problems – 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 Programmed. – Environment and human health –Value Education – HIV/AIDS – Women and Child Welfare – Role of information Technology in Environment and human health.
FIELD WORK: Visit to a local area to document environmental assets River/forest grassland/hill/mountain – Visit to a local polluted site-Urban/Rural/Industrial/Agricultural Study of common plants, insects, and birds – river, hill slopes, etc.

TEXT BOOKS:
1. Text book of Environmental Studies for Undergraduate Courses by ErachBharucha for University Grants Commission, Universities Press.
2. Environmental Studies by Palaniswamy – Pearson education
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