ANDHRA UNIVERSITY

COMMON SCHEME OF INSTRUCTIONS & EXAMINATION
I/IV B.E. / B.Tech (FOUR YEAR COURSE)
&
I/IV B.E. / B.Tech (SIX YEAR DOUBLE DEGREE COURSE)

With effect from 2015-2016 admitted batch onwards
Under Choice Based Credit System (CBCS)

Group A	Group B
Civil Engineering	Electrical & Electronics Engineering
Chemical Engineering	Electronics & Communication Engineering
Computer Science & Engineering	Mechanical Engineering
Information Technology	Marine Engineering
	Metallurgy
	Geo-Informatics
	Instrumentation Technology

GROUP-B

DEPARTMENT OF ELECTRONICS & COMMUNICATION ENGINEERING

Andhra University College of Engineering (Autonomous)
Visakhapatnam-530 003
Andhra Pradesh, India

GROUP –B

(For EEE, ECE, ME, Marine, Metallurgy, Geo-Informatics, Instrumentation Technology)

<u>I SEMESTER</u>

CODE NO	COURSE	Credits	Lecture Hrs	Tutorial Hrs	Lab Hrs	Total Contact Hrs/Week	Sessional Marks	Exam Marks	Total Marks
ENG 1101	English	4	3	1	--	4	30	70	100
ENG 1102	Mathematics – I	4	3	1	--	4	30	70	100
ENG 1103	Mathematics – II	4	3	1	--	4	30	70	100
ENG 1105	Physics	4	3	1	--	4	30	70	100
ENG 1107	Engg. Graphics	4	2	--	3	5	30	70	100
ENG 1109	Ethics & Moral Values	2	2	--	--	2	30	70	100
ENG 1111	Physics Laboratory	2	--	--	3	3	50	50	100
ENG 1113	Workshop	2	--	--	3	3	50	50	100
ENG 1114	Sports/NSS/NCC (Audit)	2	--	--	--	3	--	--	--
Total		**28**	**16**	**4**	**9**	**32**	**280**	**520**	**800**

With effect from 2015-2016 Admitted Batch   GVP SCHOOL OF ENGINEERING

II SEMESTER

CODE NO	COURSE	Credits	Lecture Hrs	Tutorial Hrs	Lab Hrs	Total Contact Hrs/Week	Sessional Marks	Exam Marks	Total Marks
ENG 1201	Mathematics – III*	4	3	1	--	4	30	70	100
ENG 1203	Chemistry	4	3	1	--	4	30	70	100
ENG 1205	Comp. Prog. & Num. Methods	4	3	1	--	4	30	70	100
ENG 1207	History of Science & Technology	2	2	--	--	2	30	70	100
ECE 1208	Basic Electronics Engineering	4	3	1	--	4	30	70	100
ENG 1210	Chemistry Lab	2	--	--	3	3	30	70	100
ENG 1212	Comp. Prog. & Num. Methods Lab	2	--	--	3	3	50	50	100
ENG 1213	English Language Lab*	2	--	--	3	3	50	50	100
ENG 1214	NCC/NSS/Sports (Audit)*	2	--	--	--	3	--	--	--
Total		**26**	**14**	**3**	**9**	**30**	**280**	**520**	**800**

*Common to both Group-A and Group-B

ENG 1101 ENGLISH

Lectures/week 4 (3+1*)   Sessional Marks 30
Credits: 4   Exam. Marks 70

1) Vocabulary: Word Search, Discuss and Note – Word Quiz – A List of 100 Basic Words – One Word Substitutes – 100 Difficult Words, Synonyms, Antonyms, Idioms, Technical terms

2) Grammar: Types of Sentences, Verbs, Adverbs, Pronouns, Adjectives, Gerunds & Infinitives, Articles, Quantifier, Punctuation, Prepositions, Conjunctions, Exclamation.

3) Reading: Famous People – What is Personality, Personality Based on Blood Groups – News Report, Magazine Article, Mobile Towers and Health – An Excerpt from a Short Story, An Excerpt from a Biography – Open Letter to Prime Minister, Business Dilemmas: An Email Exchange – A

Review of IPL: The Inside Story, Marck Zuckerberg: World's Youngest Billionaire – Solar Power: The Way Forward, From the Very Small to the Very Large

4) Listening: Life in a Hostel – Eating Away those Blues!, Meeting Carl Jung – A Documentary on the Big Cat – A Consultant Interviewing Employees – A Conversation about a Business Idea – An Interviewwith a Woman Engineer

5) Speaking: Your favourite Holiday Destination – Describe yourself – Why we need to Save Our Tigers-a Dialogue – Your First Interview – Pair Work: Setting up a New Business – Great Engineering Achievements.

6) Scenario: Sharing a Flat – Living in the Twenty-First Century – Global warming – Reality TV – Recession – The Sky-High Project.

7) Writing: Writing Sentences – Using your dictionary – Paragraph Writing, Arguing a Case – Essay, Formal Letters, Emails, Reports, Presentations.

8) Life Skills and Core Skills: Self-awareness and Self-Motivation – Communication, Adaptability – Motivation, Problem Solving – Personal Presentation Skills, Stress Management – Professionalism, Ethics – Innovativeness and Creativity.

Objectives:

Reading Skills
   ❖ Addressing explicit and implicit meanings of a text on current topics.
   ❖ Understanding the context.
   ❖ Learning new words and phrases.
   ❖ Using words and phrases in different contexts.

Writing Skills
   ❖ Using the basic structure of a sentence.

4

- ❖ Applying relevant writing formats to create paragraphs, essays, letters, emails, reports and presentations.
- ❖ Retaining a logical flow while writing.
- ❖ Planning and executing an assignment creatively.

Interactive skills
- ❖ Analyzing a topic of discussion and relating to it.
- ❖ Participating in discussions and influencing them.
- ❖ Communicating ideas effectively.
- ❖ Presenting ideas coherently within a stipulated time.

Life skills and Core skills
- ❖ Examining self-attributes and identifying areas that require improvement: self-diagnosis and self-motivation.
- ❖ Adapating to a given situation and developing a functional approach to finding solutions adaptability and problem solving.
- ❖ Understanding the importance of helping others: community services and enthusiasm.

LEARNING OUTCOMES
- ❖ The overall performance of the students will be enhanced after the course; they will be in a position to make presentations on topics of current interests – politics, famous personalities, science and technology, tourism, work and business environment, with increased public speaking skills.
- ❖ Students will be able to read, listen, speak and write effectively in both academic and non-academic environment.
- ❖ The students will be updated with certain real life situations, which they can handle when come to face to face.

Prescribed text book: Life through Language: A Holistic Approach to Language Learning. Board of Editors, Pearson Publishers, India. 2013.

Life through Language: An Effective Learning Experience

Life through Language has a systematic structure that builds up communicative ability progressively through the chapters. It will enable the learner to manage confusion; frame question for themselves and others; develop new ideas; support ideas with evidence; express themselves with poise and clarity; and think critically. Acquisition of skill ideas to confidence.

Chapter-1
People and Places: Word Search-Ask yourself – Self –assessment-I – Self-assessment-II – Sentence and its types – A guide book entry – Life in a hostel – Your favorite holiday destination – Designing a holiday - Writing sentences – Self-awareness – Self-motivation.

Chapter-2
Personality and Lifestyle: Word quiz – Verbs – Adverbs – A big fat wedding – Wine and dine – Going places –Negotiations – Proving yourself – Meeting Carl

Jung – Describing yourself – Living in the 21st century – Using your dictionary – Communication – Adaptability.

Chapter-3
Media and Environment: A list of 100 basic words – Nouns – Pronouns – Adjectives – News report – Magazine article – User Manual for new iPod – A documentary on the big cat – Why we need to save our tigers: A dialogue – Global warming – Paragraph Writing – Arguing a case – Motivation – Problem solving.

Chapter-4
Entertainment and Employment: One word substitutes – Parts of speech – Gerunds and infinitives – An expert from a short story an expert from a biography – A consultant interviewing employees – Your first interview – Reality TV – Writing an essay – correcting sentences – Integrity Sense of humour.

Chapter-5
Work and Business: A list of 100 difficult words – Articles, Quantifiers – Punctuation – Open letter to the Prime Minister Business dilemmas: An email exchange – A review of *IPL: The Inside Story*, Mark Zuckerberg: World's Youngest Billionaire – A Conversation about a business idea – Pair Work: Setting up a new business – Recession –Formal letters – Emails – Reports – Professionalism – Ethics.

Reference Books:
1. *Basic Vocabulary.* Edgar Thorpe, Showick Thorpe. Pearson P. 2008.
2. *Quick Solutions to Common Errors in English.* Angela Bunt. MacMillan P. 2008
3. Know Your English (Volume 1 & 2), by Dr. S. Upendra, University Press, India 2012.
4. *Business Communication Strategies.* Mathukutty Monippally. Tata Mc Grawhill P. 2009

ENG 1102 Mathematics-I

Lectures/week 4 (3+1*) Sessional Marks 30
Credits: 4 Exam. Marks 70

Unit I
Partial Differentiation
Functions of Two or More Variables, Partial Derivatives, Homogeneous Functions- Euler's Theorem, Total Derivative, Change of Variables, Jacobians, Geometrical Interpretation- Tangent Plane and Normal to a surface.

Unit II

Application of Partial Differentiation

Taylor's Theorem for functions of two variables, Errors and approximations. Total Differential, Maxima and Minima of functions of two variables. Lagrange's method of undetermined multipliers, Differentiation under the integral sign – Leibnitz's Rules.

Unit III
Ordinary Differential Equations of First Order and First Degree:
Formation of ordinary differential equations (ODEs). Solutions of an ordinary differential equation. Equations the first order and first degree, Linear differential equations. Bernoulli's equations. Exact differential equations. Equation reducible to exact equations.

Unit IV
Applications of Differential equations of first order
Orthogonal trajectories, Simple Electric (LR & CR) circuits. Newton's law of cooling-Law of natural growth and decay
Unit V
Linear Differential equations of higher order
Solutions of linear ordinary differential equations with constant coefficients. Rules for finding the complimentary function-rules for finding the particular integral-method of variation of parameters - Cauchy's linear equations - Legendre's linear equations, Simultaneous linear equations with constant coefficients.
Unit VI
Infinite series:
Introduction to series, Convergence, Divergence and oscillation of a series, comparison test, Limit form, Integral test. D'Alembert's Ratio test. Raabe's test. Logarithmic test. Cauchy's Root test. Alternating series- Leibnitz's rule, Series of positive or negative terms. Absolute and conditional convergence, Uniform convergence. Weirstrass M-test (all tests without proofs).

Text Books:
   Scope and Treatment as in "Higher Engineering Mathematics" by Dr. B.S Grewal, 43rd edition, Khanna publishers.
Reference Books:
1. Advanced Engineering Mathematics by Erwin Kreyzig.
2. A text book of Engineering Mathematics by N.P.Bali and Dr. Manish Goyal, Lakshmi publications.
3. Advanced Engineering Mathematics by H.K.Dass. S.Chand Company.
4. Higher Engineering Mathematics by B.V Ramana, Tata McGraw Hill Company.
5. Higher Engineering Mathematics by Dr. M.K. Venkataraman.

Lectures/week 4 (3+1*)   Sessional Marks 30
Credits: 4   Exam. Marks 70

Unit-I
Matrices-I:
Rank of a Matrix. Echelon form, Normal Form- Solution of linear system of equations – consistency of linear system of equations – direct methods: Gaussian Elimination method, LU factorization method - Eigen Values and Eigen Vectors of a Matrix - Cayley Hamilton Theorem – Inverse and powers of a matrix using Cayley Hamilton Theorem
Unit-II
Matrices-II:
Diagonalization of a matrix - Quadratic forms – Reduction of Quadratic form to Canonical forms – Nature of a Quadratic form – Complex matrices – Hermitian, skew Hermitian matrices and Unitary Matrices and their properties.
Unit-III
Laplace transforms
Introduction - Existence conditions - Transforms of elementary functions - Properties of Laplace Transforms - Transforms of derivatives - Transforms of Integrals - Multiplication by 't^n'- division by 't'- Evaluation of Integrals by Laplace Transforms - Laplace transforms of Unit step function, Unit Impulse function and Periodic functions.
Unit IV
Laplace transforms
Inverse Laplace Transform - Convolution theorem. Applications of Laplace Transforms to Ordinary Differential Equations, Simultaneous Linear Equations with constant coefficients.
Unit V
Special Functions
Bessel's equation – Bessels functions- Recurrence formulae for Bessels functions - Generating function- equations reducible to Bessel's equations - Orthogonality relation for Bessel's functions. Legendre's differential equation – general solution of Legendre's equation - Legendre Polynomials, Rodrigue's formula – generating function – recurrence formulae –Orthogonality of Legendre Polynomials.

Text Books:
   Scope and Treatment as in "Higher Engineering Mathematics" by Dr. B.S Grewal, 43rd edition, Khanna publishers.
Reference Books:
   1. Advanced Engineering Mathematics by Erwin Kreyzig.
   2. A text book of Engineering Mathematics by N.P.Bali and Dr. Manish Goyal, Lakshmi publications.
   3. Advanced Engineering Mathematics byH.K.Dass. S.Chand Company.
   4. Higher Engineering Mathematics by B.V Ramana, Tata McGraw Hill Company.

ENG. 1105 PHYSICS

Lectures/week 4(3+1*)   Sessional Marks 30
Credits: 4   Exam. Marks 70

Unit-I

THERMODYNAMICS

Introduction, Heat and Work, First law of thermodynamics and applications, Reversible and Irreversible process, Carnot cycle and Efficiency, Second law of thermodynamics, Carnot's Theorem, Entropy, Second Law in terms of entropy, Entropy and disorder, Third law of thermodynamics (statement only).   (8 Hours)

Unit-II

ELECTROMAGNETISM

Concept of electric flux, Gauss law, some applications, Electric potential and field strength, potential due to a point charge and dipole. Magnetic field – Magnetic force on current, torque on current loop, The Biot-Savart's Law. B near a long wire, B for a circular Current loop, Ampere's law, B for a solenoid, Hall Effect, Faraday's law of induction. Lenz's law, Inductance. L-R Circuit. Induced magnetic fields, Displacement current. Maxwell's equations (Both differential and Integral forms). Magnetic materials: Classification of magnetic materials and properties.
(16 Hours)

Unit-III

OPTICS

Interference: Principles of superposition – Young's Experiment – Coherence – Interference in thin films, Wedge shaped film, Newtons Rings, Michelson Interferometer and its applications.

Diffraction: Single slit (Qualitative and quantitative treatment).

Polarisation: Polarisation by reflection, refraction and double refraction in uniaxial crystals, Nicol prism, Quarter and Half wave plate, circular and elliptical polarization and detection.
(12 Hours)

Unit-IV

LASERS

Introduction, Spontaneous and stimulated emissions, population inversions, pumping, Ruby laser, Gas laser (He-Ne Laser), Semiconductor laser, Applications of lasers.

FIBRE OPTICS

Optical Fibre and Total Internal Reflection, Acceptance Angle and cone of a fibre, Numerical aperture, Fibre optics in communications, Optical parts in Fibre, Applications of Optical fibers.

ULTRASONICS

Introduction, Production of Ultrasonics by Magnetostriction and Piezoelectric effects – Ultrasonics and diffraction pattern, Applications of Ultrasonics.   (14 Hours)

Unit-V

MODERN PHYSICS

De Broglie concept of matter waves, Heisenberg uncertainty principle, Schrodinger time independent wave equation, application to a particle in a box. Free electron theory of metals,

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Kronig Penny Model (Qualitative treatment), Origin of energy band formation in solids, Classification of materials into conductors, Semi-conductors and insulators.

SUPER CONDUCTIVITY

Super conductivity, Meisner Effect, Types of Superconductors and Applications of Superconductors.

NANOPHASE MATERIALS

Introduction and properties and applications, Synthesis – Chemical Vapour deposition method-sol-gel methods, Applications of nano-materials.   (10 Hours)

Books Recommended
1. Engineering Physics by R.K. Gaur and S.D. Gupta
2. Physics by David Halliday and Robert Resnick – Part I and Part II

Reference Books:
1. Engineering Physics by M.N. Avadhanulu& P.G. Kshirsagar; S Chand & Company Ltd.
2. Modern Engineering Physics by A.S. Vasudeva
3. University Physics by Young & Freedman
4. Nonconventional Energy by Ashoke V. Desai

ENG 1107 ENGINEERING GRAPHICS

Lectures/week 5 (2+3)   Sessional Marks 30
Credits: 4   Exam. Marks 70

Introduction: Lines, Lettering and Dimensioning. Geometrical Constructions. Introduction to Scales.
Curves: Conicsections: General construction of ellipse, parabola and hyperbola. Construction of involutes. Normal and tangent.
Projection of Points: Principal or Reference planes, Projections of a point situated in any one of the four quadrants
Projections of Straight Line: Projections of straight lines parallel to both reference planes, perpendicular to one reference plane and parallel to other reference plane, inclined to one reference plane and parallel to the other reference plane. Projections of straight line inclined to both the reference planes:
Projections of Planes: Projection of Perpendicular planes: Perpendicular to both reference planes, perpendicular to one reference plane and parallel to other reference plane and perpendicular to one reference plane and inclined to other reference plane. Projection of Oblique planes. Introduction to Auxiliary Planes.
Projections of Solids: Types of solids: Polyhedra and Solids of revolution. Projections of solids in simple positions: Axis perpendicular to horizontal plane, Axis perpendicular to vertical plane and Axis parallel to both the reference planes, Projection of solids with axis inclined to one reference plane and parallel to other and axes inclined to both the reference planes.
Projections of sections of solids: Section planes: Parallel and inclined section planes, Sections and true shape of section, Sections of solids: Prism, Pyramid, Cylinder and cone.
Development of surfaces: Methods of development: Parallel line development and radial line development. Development of a cube, prism, cylinder, pyramid and cone.
Isometric Views: Introduction to Isometric projection, Isometric scale and Isometric view. Isometric view of simple planes. Isometric view of Prisms, Pyramids, cylinder and cone. Isometric view of an object when projections are given.

Textbook:
Elementary Engineering Drawing by N.D. Bhatt, Charotar Publishing House.

Reference:
Engineering Graphics by K.L. Narayana and P. Kannaiah, Tata Mc-Graw Hill.

ENG 1109 PROFESSIONAL ETHICS & HUMAN VALUES

Lectures/week 2   Sessional Marks 30

Credits: 2   Exam. Marks 70

UNIT-I

Ethics and Human Values: Ethics and Values, Ethical Vision, Ethical Decisions, Human Values – Classification of Values, Universality of Values.   (6 Periods)

UNIT-II

Engineering Ethics: Nature of Engineering Ethics, Profession and Professionalism, Professional Ethics, Code of Ethics, Sample Codes – IEEE, ASCE and CSI.   (6 Periods)

UNIT-III

Engineering as Social Experimentation: Engineering as social experimentation, Engineering Professionals – life skills, Engineers as Managers, Consultants and Leaders, Role of engineers in promoting ethical climate, balanced outlook on law.   (6 Periods)

UNIT –IV

Safety Social Responsibility and Rights: Safety and Risk, moral responsibility of engineers for safety, case studies – Bhopal gas tragedy, Chernobyl disaster, Fukushima Nuclear disaster, Professional rights, Gender discrimination, sexual harassment at work place.   (6 Periods)

UNIT – V

Global Issues: Globalization and MNC's, Environmental Ethics, Computer Ethics, Cyber Crimes, Ethical living, concept of Harmony in life.   (6 Periods)

Text Books:

1. Govindharajan, M., Natarajan. S. and Senthil Kumar, V.S., Engineering Ethics, Prentice Hall of India, (PHI) Delhi, 2004.

2. Subramaniam, R., Professional Ethics, Oxford University Press, New Delh, 2013.

Reference Book:

1. Charles D, Fleddermann, "Engineering Ethics", Pearson /PHI, New Jersey 2004 (Indian Reprint)

ENG 1111 PHYSICS LABORATORY

Practicals/week 3   Sessional Marks 50

Exam 3 Hrs   Exam. Marks 50

1. Melde's Experiment – Determination of the frequency of an electrically maintained tuning fork.

2. Newton's Rings – Determination of radius of curvature of a convex lens.

3. Diffraction Grating – Determination of wavelengths in mercury line spectrum using spectrometer.

4. Determination of Cauchy's constants using Spectrometer and mercury light.

5. Wedge Method – Determination of thickness of a paper by forming parallel interference fringes.

6. Determine the refractive index of Ordinary (μ_0) and extra-ordinary ray (μ_e) rays.

7. Variation of magnetic field along the axis of current carrying circular coil – Stewart and Gee's apparatus

8. Carey Foster's bridge a) Laws of resistance b) Temperature coefficient of resistance.

9. Lee's Method – Determination of coefficient of thermal conductivity of a bad conductor.

10. Determination of Magnetic moment and Horizontal (M & H) component of Earth's magnetic field.

11. Calibration of voltmeter using potentiometer.

12. Calibration of Ammeter using potentiometer.

13. Determination of band gap of semiconductor.

14. Laser Diffraction

15. Hall Effect – a) Determination of hall coefficient b) Determination of charge density.

ENG 1113 Workshop

Practicals/week: 3   Sessional Marks: 50
Exam: 3 Hrs   Exam. Marks: 50

1. **Carpentry:**

   Bench Work, Tools Used in Carpentry.
   Jobs for class work – half lap joint, mortise and tenon joint, half – lap dove tail joint, corner dovetail joint, central bridle joint.

2. **Sheet Metal:**

   Tools used in sheet metal work. Laying development of the sheet metal jobs. Soldering.
   Jobs for class work – Square Tray, Taper Tray (Sides), funnel, elbow pipe joint, 60° pipe joint.

3. **Fitting:**

   Tools used in fitting work, Different files, chisels, hammers and bench vice.
   Jobs for class work – Square, hexagon, rectangular fit, circular fit and triangular fit.

Reference

1. Elements of workshop technology, Vol. 1 by S. K. Hajra choudary.

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ENG 1114 SPORTS/NSS/NCC (AUDIT)

Hours/week: 3   Credits: 2

It is only an audit course and the credits are given based on the attendance. Every student should have   a minimum of 75% attendance and as per university rules. Every student should choose either sports or NCC or NSS at the starting of the semester and pursue the same in that semester.

II SEMESTER

CODE NO	COURSE	Credits	Lecture Hrs	Tutorial Hrs	Lab Hrs	Total Contact Hrs/Week	Sessional Marks	Exam Marks	Total Marks
ENG 1201	Mathematics – III*	4	3	1	--	4	30	70	100
ENG 1203	Chemistry	4	3	1	--	4	30	70	100
ENG 1205	Comp. Prog. & Num. Methods	4	3	1	--	4	30	70	100
ENG 1207	History of Science & Technology	2	2	--	--	2	30	70	100
ECE 1208	Basic Electronics Engineering	4	3	1	--	4	30	70	100
ENG 1210	Chemistry Lab	2	--	--	3	3	30	70	100
ENG 1212	Comp. Prog. & Num. Methods Lab	2	--	--	3	3	50	50	100
ENG 1213	English Language Lab*	2	--	--	3	3	50	50	100
ENG 1214	NCC/NSS/Sports (Audit)*	2	--	--	--	3	--	--	--
Total		**26**	**14**	**3**	**9**	**30**	**280**	**520**	**800**

*Common to both Group-A and Group-B

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ENG 1201 MATHEMATICS-III

Lectures/week = 4 (3+1*)   Sessional Marks =30
Credits: 4   Exam. Marks = 70

Unit – I
Solid Geometry
Equations of Straight Line-Conditions for a line to line in a plane-Coplanar Lines-Shortest Distance between two lines-Intersection of three planes-Equations of Sphere-Tangent Plane to a Sphere-Cone-Cylinder.

Unit – II
Multiple Integrals-1
Double Integrals-Change of Order of Integration-Double Integrals in Polar Coordinates- Triple Integrals-Change of Variables

Unit – III
Multiple Integrals-2
Beta Function-Gamma Function-Relation between Beta and Gamma Function-Error Function or Probability Integral-Area enclosed by Plane Curves-Volumes of Solids-Area of Curved Surface-Calculation of Mass-Centre of Gravity-Moment of Inertia-Principal Axes.

Unit – IV
Fourier Series
Introduction-Euler's Formulae-Conditions for a Fourier Expansion-Functions having points of discontinuity-Change of Interval-Odd and Even Functions-Expansions of Odd or Even Periodic Functions-Half Range Series-Perseval's Formula.

TEXT BOOK:
Scope and Treatment as in "Higher Engineering Mathematics", by Dr. B. S. Grewal, 43rd edition, Khanna Publishers.

REFERENCE BOOKS:
1. Advanced Engineering Mathematics by Erwin Kreyszig.
2. A text book of Engineering Mathematics, by N. P. Bali and Dr. Manish Goyal, Lakshmi Publications.
3. Advanced Engineering Mathematics by H. K. Dass, S. Chand Company.
4. Higher Engineering Mathematics by B. V. Ramana, Tata Mc Graw Hill Company Engineering Mathematics Series by Chandrica Prasad.

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ENG 1203 CHEMISTRY

Lectures/week = 4 (3+1*)   Sessional Marks =30

Credits: 4   Exam. Marks = 70

Chapter 1: Water Chemistry

Sources of water – Impurities and their influence on living systems – W.H.O. limits - Hardness and its Determination –. Boiler troubles and their removal - Water softening methods – Lime-Soda, Zeolite and Ion exchange - Municipal water treatment – Break point chlorination - Desalination of Sea Water - Reverse osmosis method, Electrodialysis   (8 Hours)

Chapter 2: Solid State Chemistry

Solids: Classification of Solids – Types of Crystals – Fundamental laws of Crystal Structure – X-Rays and Bragg's Law - Imperfections in crystals - Band Theory of solids - Chemistry of Semiconductors - Intrinsic, Extrinsic, Compound and Defects - Organic semiconductors - Super Conductivity - Purification of solids by Zone refining - Single Crystal Growth – Epitaxial growth - Liquid crystals.   (8 Hours)

Chapter 3: Polymers and Plastics

Polymers: Definition – Types of polymerization (Addition & Condensation) – Mechanism of addition polymerization – Radical and Ionic – Thermodynamics of Polymerisation Process.
Plastics: Thermosetting and Thermoplastic – Effect of Polymer Structure on Properties of Plastics - Compounding of plastics – Fabrication of plastics. Preparation and properties of cellulose derivatives - Vinyl resins – Nylon (6,6), Bakelite, Reinforced plastics - Conducting polymers.   (10 Hours)

Chapter 4: Corrosion

Corrosion: Origin and Theory – Types of corrosion: Chemical and Electrochemical; Pitting, Intergranular, Waterline, Stress – Galvanic Series - Factors Effecting Corrosion
Corrosion Controlling Methods: Protective Coatings: Metallic coatings, Electroplating and Electro less Plating – Chemical Conversion Coatings - Phosphate, Chromate, Anodized. Organic coatings – Paints and Special paints.   (10 Hours)

Chapter 5: Building Materials

Portland Cement: Manufacture of Cement - Dry and Wet Processes – Chemical Composition of Cement - Setting and hardening of cement - Cement concrete - RCC - Decay of concrete and Protective Measures - Special Cements.
Refractories: Classifications - Properties - Engineering Applications.
Ceramics: Classification - Properties - Engineering Applications.   (10 Hours)

Chapter 6: Fuels and Lubricants

Solid Fuels: Wood and Coal, Ranking of Coal – Analysis (Proximate and Ultimate) Coke Manufacture – Otto Hoffmann's Process – Applications
Liquid Fuels: Petroleum Refining - Motor fuels – Petrol and Diesel Oil - Knocking – Octane number - Cetane number.
Gaseous Fuels: Biogas, LPG and CNG – Characteristics - Applications.
Rocket fuels -Propellants – Classification – Characteristics   (10 Hours)
Lubricants: Classification - Mechanism - Properties of Lubricating Oils - Selection of lubricants for Engineering applications.

Prescribed Text Books
Engineering Chemistry, P.C. Jain and M. Jain - Dhanapathi Rai & Sons, Delhi
A text book of Engineering Chemistry, S.S. Dara - S. Chand & Co. New Delhi
Engineering Chemistry, B.K. Sharma - Krishna Prakashan, Meerut

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ENG 1205 Computer Programming using C and Numerical Methods

Lectures/week = 4 (3+1*)   Sessional Marks =30

Credits: 4   Exam. Marks = 70

1. **Introduction to C:** Basic structure of C program, Constants, Variables and data types, Operators and Expressions, Arithmetic Precedence and associativity, Type Conversions. Managing Input and Output Operations, Formatted Input, Formatted Output.

2. **Decision Making, Branching, Looping, Arrays & Strings:** Decision making with if statement, Simple if statement, The if…else statement, Nesting of if …else statement, the else…if ladder, switch statement, the (?;) operator, the GOTO statement., The while statement, the do statement, The for statement, Jumps in Loops, One, Two-dimensional Arrays, Character Arrays. Declaration and initialization of Strings, reading and writing of strings, String Handling functions, Table of strings.

3. **Functions:** Definitions of Functions, Return Values and their Types, Function Calls, Function Declaration, Category of Functions: No Arguments and no Return Values, Arguments but no Return Values, Arguments with Return Values, No Argument but Returns a Value, Functions that Return Multiple Values. Nesting of functions, recursion, passing arrays to functions, passing strings to functions, The scope, visibility and lifetime of variables.

4. **Pointers:** Accessing the address of a variable, declaring pointer variables, initializing of pointer variables, accessing variables using pointers, chain of pointers, pointer expressions, pointers and arrays, pointers and characters strings, array of pointers pointers as function arguments, functions returning pointers, pointers to functions, pointers to structures – Program Applications.

5. **Structure and Unions:** Defining a structure, declaring structure variables, accessing structure members, structure initialization, copying and comparing structure variables, arrays of structures, arrays within structures, structures within structures, structure and functions and unions, size of structures and bit-fields- Programs applications.

6. **File Handling:** Defining and opening a file, closing a file, Input/ Output operations on files, Error handling during I/O operations, random access to files and Command Line Arguments- Program Applications.

7. **Numerical Methods; Solutions of Algebraic and Transcendental Equations:** Bisection Method, Newton Raphson Method. **Interpolation:** Newton's forward and backward Interpolation, Lagrange's Interpolation in unequal intervals. **Numerical Integration:** Trapezoidal rule, Simpson's 1/3 rule. **Solutions of Ordinary First Order Differential Equations:** Euler's Method, Modified Euler's Method and Runge-Kutta Method.

Text Books:
1. Programming in ANSI C, E Balagurusamy, 6th Edition. Mc-Graw Hill Edition (India) Private Limited.
2. Introduction to Numerical Methods, SS Sastry, Prentice Hall.

Reference Books:
1. Let Us C, Yashwant Kanetkar, BPB Publications, 5th Edition.
2. Computer Science, A structured programming approach using C, B.A. Forouzan and R.F. Gilberg, 3rd Edition, Thomson, 2007.
3. The C-Programming Language B.W. Kernighan, Dennis M. Ritchie, PHI
4. Scientific Programming: C-Language, Algorithms and Models in Science, Luciano M. Barone (Author), Enzo Marinari (Author), Giovanni Organtini, World Scientific.

ENG 1207 HISTORY OF SCIENCE AND TECHNOLOGY

Lectures/week = 2   Sessional Marks =30
Credits: 2   Exam. Marks = 70

Objectives of the Course:
- ❖ To know the contributions of scientists for the development of society over a period of time.
- ❖ To understand the Science and Technological developments that lead to human welfare.
- ❖ To appreciate the Science and Technological contributions for the development of various sectors of the economy.
- ❖ To identify the technological transfer versus economic progress of the countries.

Learning Outcome: By the end of this course the students should be able to understand the contribution of Scientific and Technological developments for the benefit of society at large.

Unit-I
Historical Perspective of Science and Technology:
Nature and Definitions, Roots of Science – In Ancient Period and Modern Period (During the British Period); Science and Society; Role of Scientists in the society.   (6 Periods)

Unit-II
Polices and Plans After Independence:
Science and Technology Policy Resolutions; New Technology Fund; Technology Development (TIFAC); Programs aimed at technological Self Reliance; Activities of Council of Scientific and Industrial Research.   (6 Periods)

Unit-III
Science and Technological Developments in Critical Areas:
Space – The Indian Space Program: India's Geostationary Satellite Services – INSAT System And INSAT Services; **Defense Research and Technology** – Research Coordination, Research efforts and Development of Technologies and Spin-off technologies for civilian use; **Nuclear Energy –** Effects of a nuclear explosion and India's explosion and India's safety measures.

        (6 Periods)

Unit-IV
Impact of Science and Technology in Major Areas:
Ocean Development: Objectives of Ocean Development, Biological and Mineral resources, Marine Research and Capacity Building; **Biotechnology:** Meaning, Biotechnology techniques – Bioreactors, Cell fusion, Cell or Tissue Culture, DNA Fingerprinting, Cloning, Artificial Insemination and Embryo Transfer Technology and Stem Cell Technology; Applications of Biotechnology – Medicine, Biocatalysts, Food Biotechnology, Fuel and Fodder and Development of Biosensors.   (6 Periods)

Unit-V
Technology Transfer and Development:
Transfer of Technology - Types, Methods, Mechanisms, Process, Channels and Techniques: **Appropriate Technology** –Ceriteria and Selection of an Appropriate Technology; Barriers of Technological Change.   (6 Periods)

Text Books:
1. Kalpana Rajaram, **Science and Technology in India,** Published and Distributed by Spectrum Books (P) Ltd., New Delhi-58.
2. Srinivasan, M., **Management of Science and Technology (Problems & Prospects),** East – West Press (P) Ltd., New Delhi.

ECE 1208 BASIC ELECTRONICS ENGINEERING

Lectures/week = 2   Sessional Marks =30

Credits: 4   Exam. Marks = 70

1. **Common Electronic materials and properties:**
   Conductors, Insulators, Semi-Conductors, Intrinsic, Extrinsic semiconductors, conduction in semiconductors, charge mobility, Fermi Dirac function, Fermi level, charge densities, diffusion current density, drift current density, Hall effect.

2. **Passive Components, Circuit Theorems and Basic meters:**
   Types of passive components, types of resistors, resistor color code, capacitors, concept of charging and discharging, types of capacitances, inductors, mutual inductance, inductance of two coils, KCL, KVL, common meters, CRO.

3. **Fundamentals of diodes and special diodes:**
   Elementary concepts, V-I characteristics and applications of PN junction diode, Varactor diode, Zener diode, LED, Tunnel diode, Photo diode, Schottky diode and PIN diode.

4. **Fundamentals of BJT, FET and MOSFET (Elementary concepts):**
   Transistor construction, Operation of the transistor, transistor configuration, input and output characteristics, applications of transistor in three configurations, comparison of BJT and JFET, JFET construction, operation of FET, JFET characteristics, JFET configurations and applications, concept of MOSFET, types of MOSFETs.

5. **Basic concepts of Power devices and Integrated Circuits (ICs):**
   Construction, applications and features of UJT, SCR, DIAC and TRIAC, introduction to Integrated Circuits, classification of ICs, salient features of OP-AMP, characteristics of an ideal OP-AMP and applications, salient features of 555 timer and applications.

Text Books:

1. Electronic Devices and Circuits by **G.S.N.Raju**, IK International, New Delhi.
Reference Books:

1. Basic Electronics by **Bernard Grob**, 4th edition, International Student edition, MC Graw Hill publishers.
2. Electronic Devices and Circuits by **Sanjeev Guptha**.
3. Electronic Devices and Circuits Theory by **Robert L. Boylestad & Louis Nashelsky**, PHI edition.

ENG 1210 CHEMISTRY LABORATORY

Practical's/week = 3   Sessional Marks =50

Credits: 2   Exam. Marks = 50

List of Experiments:

01. Determination of Sodium Hydroxide with HCL (Na_2CO_3 Primary Standard)

02. Determination of Fe (II)/ Mohr's Salt by Permanganometry

03. Determination of Oxalic Acid by Permanganometry.

04. Determination Hardness of water sample by ETDA method.

05. Determination of Calcium in Portland cement by Permanganometry.

06. Determination of Chromium (VI) by Mohr's Salt solution (Complexometric Titration).

07. Determination of Zinc by EDTA method.

08. Determination of Alkalinity (Carbonate and Hydroxide) of a water sample – (Demonstration)

09. Determination of strength of given HCL solution by titrating against NaOH using a pH meter (Demonstration)

10. Determination of Copper (II) by Iodometric Titration (Demonstration)

Reference Books:

1. Vogel's Quantitative Chemical Analysis – V Edition – Longman.

Experiments in Applied Chemistry (For Engineering Students) – Sunita Rattan – S.K. Kataria & Sons, New Delhi.

With effect from 2015-2016 Admitted Batch   GVP SCHOOL OF ENGINEERING

ENG 1212 COMPUTER PROGRAMMING AND NUMERICAL METHODS LABORATORY

Practical's/week = 3   Sessional Marks =50

Credits: 2   Exam. Marks = 50

1. Write a program to read x,y coordinates of 3 points and then calculate the area of a triangle formed by them and print the coordinates of the three points and the area of the triangle. What will be the output from your program if the three given points are in a straight line?

2. Write a program, which generates 100 random integers in the range of 1 to 100. Store them in an array and then print the arrays. Write 3 versions of the program using different loop constructs. (e.g. for, while, and do while)

3. Write a set of string manipulation functions e.g. for getting a sub-string from a given position, Copying one string to another, Reversing a string, adding one string to another.

4. Write a program which determines the largest and the smallest number that can be stored in different data types like short, int., long, float and double. What happens when you add 1 to the largest possible integer number that can be stored?

5. Write a program, which generates 100 random real numbers in the range of 10.0 to 20.0, and sort them in descending order.

6. Write a function for transposing a square matrix in place (in place means that you are not allowed to have full temporary matrix).

7. First use an editor to create a file with some integer numbers. Now write a program, which reads these numbers and determines their mean and standard deviation.

8. Implement bisection method to find the square root of a given number to a given accuracy.

9. Implement Newton Raphson method to det. a root of polynomial equation.

10. Given a table of x and corresponding f(x) values, write a program which will determine f(x) value at an intermediate x value using Lagrange's interpolation.

11. Write a function which will invert a matrix.

12. Implement Simpson's 1/3 rule for numerical integration.

13. Implement Trapezoidal rule for numerical integration.

14. Write a program to solve a set of linear algebraic equations.
15. Write a program to solve a differential equation using Runge-Kutta Method.

ENG 1213 English Language Lab

Practicals/week: 3   Sessional Marks: 50
Exam: 3 Hrs   Exam. Marks: 50
                                                               Credits: 2

The **Language Lab** focuses on the production and practices of sounds of language and familiarizes the students with use of English in everyday situations and contexts.

SYLLABUS:

1. English Sound Pattern – Letters
2. Sounds of English
3. Pronunciation
4. Stress and Intonation.

OBJECTIVES:

- To make students recognize the sounds of English through Audio-Visual aids.
- To help students build their confidence and help overcome their inhibitions and self-consciousness while speaking in English. *The focus shall be on fluency.*
- To familiarize the students with stress and intonation and enable them to speak English effectively.

LEARNING OUTCOMES:

- Students will be sensitized towards recognition of English sound pattern.
- The fluency in speech will be enhanced.

Prescribed Text Book:

Speak Well, Board of Editors, Orient Black Swan Publishers, Hyderabad, 2012.

Speak Well, the print as well as audio materials, is learner friendly and suitable for use in a multimedia language laboratory. These materials are developed to facilitate practice in improving the intelligibility and communication skills in English, for technical, students at the undergraduate level.

The materials mainly aim at self-study, monitory by a teacher whenever essential. The teacher intervention is kept to a minimum, only to give a right direction to the learners.

Communication in any language depends on clarity of speech. This is true of English too. Articulation of the sounds, and pronunciation of sounds from the basis of intelligibility. The few units focus on bringing home the importance of this aspect with copious examples and opportunities for practice. Models of standard pronunciation are given. Explanations are kept short and simple. The IPA symbols, presenting the sound system in English, used in this are the same as in standard English dictionaries. These symbols are to be used at the recognition level to facilitate the learners' use of dictionary for pronunciation. Problem areas are pointed out and, where necessary, deviation in the pronunciation of the Indian speakers of English are brought to the notice of the learners.

The units called 'Interactions' pay attention to the natural conversational skills in different contexts with focus on various functions of the language. Model conversations are provided as samples. Notes on appropriate expressions used in different situations' drawn the learners, attention the use of language in context. Exercises and activities reinforce the functions introduced.

Unit-1: Letters and Sounds
     Worksheet-1
Unit-2: Interactions-1
     Worksheet-2
Unit-3: The Sounds of English
     Worksheet-3
Unit-4: Interactions-2
     Worksheet-4
Unit-5: Pronouncing Words-Some important patterns
     Worksheet-5
Unit-6: Interactions-3
     Worksheet-2
Unit-7: Stress and Intonation
     Worksheet-2

Reference Books:
1. Cambridge English Pronouncing Dictionary, Cambridge University Press, India, 2012.
2. A Textbook of English phonetics for Indian students by T. Balasubramanian, Macmillan publisher, 1981.

DISTRIBUTION AND WEIGHTAGE OF MARKS:

1. The practical examination for the English language lab shall be conducted as per the university norms prescribed for the core engineering practical sessions.
2. For the language lab sessions, there shall be a continuous evaluation during the sesmester for 50 sessional marks and 50 semester end examination marks.
3. For the 50 sessional marks, 20 marks shall be awarded for day-to-day performance, 10 marks to be awarded by conducting internal lab test(s), and 20 marks for worksheets attached to the lab manual.
4. For the 50 semester end (external) marks, 30 marks shall be awarded for written examination (dialogues, the sounds of English and the stress) and 20 marks for external examiner viva-voce, tested by way of reading a passage or a conversation.

NOTE: The external lab shall be conducted by the teacher concerned with the help of another English faculty of affiliated colleges of the university/other institutions.

ENG 1214 SPORTS/NSS/NCC (AUDIT)

Hours/week: 3   Credits: 2

      It is only an audit course and the credits are given based on the attendance. Every student should have   a minimum of 75% attendance and as per university rules. Every student should choose either sports or NCC or NSS at the starting of the semester and pursue the same in that semester.