

SCHOOL OF ENGINEERING AND TECHNOLOGY

Scheme and Syllabus (CBCS)

for

B. Tech. Programmes

2016-2017



***Central University of Haryana
Jant-Pali, Mahendergarh-123031
Haryana***

SCHEME OF EXAMINATIONS
B.Tech. (All Branches)
First Year
Session 2016-2017

SEMESTER-I

CODE	SUBJECT	L	T	P	TOTAL Contact Hours	CREDITS	THEORY	INTERNAL CLASS WORK	EXTERNAL PRACTICAL	TOTAL MARKS
BT HUM 101	Communication Skills-I	3	0		3	3	70	30	-	100
BT EMA 102	Engineering Mathematics-I	3	1		4	4	70	30	-	100
BT EPH 103	Engineering Physics-I	3	1		4	4	70	30	-	100
BT ECH 104	Engineering Chemistry-I	3	1		4	4	70	30	-	100
BT EGD 105	Engineering Drawing	2	0	4	6	4	-	30	70	100
BT EIT 106	Essentials of Information Technology and Computer Programming	3	1		4	4	70	30	-	100
BT PHL 107	Physics Laboratory-I	0	0	2	2	1	-	15	35	50
BT CHL 108	Chemistry Laboratory-I	0	0	2	2	1	-	15	35	50
BT CPL 109	Computer Programming Laboratory	0	0	2	2	1	-	15	35	50
BT VEY 110	Value Education and Yoga#	0	0	2	2	0	-	30	70	100

Qualifying Nature

SCHEME OF EXAMINATIONS
B.Tech. (All Branches)
First Year
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SEMESTER-II

CODE	SUBJECT	L	T	P	TOTAL Contact	CREDITS	THEORY	INTERNAL CLASS WORK	EXTERNAL PRACTICAL	TOTAL MARKS
BT HUM 201	Communication Skills-II	3	0	0	3	3	70	30	-	100
BT EMA 202	Engineering Mathematics-II	3	1	-	4	4	70	30	-	100
BT EPH 203	Engineering Physics-II	3	1	-	4	4	70	30	-	100
BT ECH 204	Engineering Chemistry-II	3	1	-	4	4	70	30	-	100
BT MP 205	Manufacturing Processes	2	1	-	3	3	70	30	-	100
BT PEE 206	Principles of Electrical and Electronics	3	1	-	4	4	70	30	-	100
BT PHL 207	Physics Laboratory-II	-	-	2	2	1	-	15	35	50
BT CHL 208	Chemistry Laboratory-II	-	-	2	2	1	-	15	35	50
BT EEL 209	Electrical and Electronics Laboratory	-	-	2	2	1	-	15	35	50
BT CTL 210	Computational Technology Laboratory	-	-	2	2	1	-	15	35	50
BT WTL 211	Workshop Technology Laboratory	0	0	4	4	1	-	15	35	50
Total		17	5	12	34	28	420	255	175	850

Prof. Nawal Kishore
TIC, SOE&T

Syllabus

B. Tech. (All Branches)

First Year, First Semester

Session 2016-2017

Communications Skills-I

BT HUM 101

UNIT I

Technical Communication: features; Distinction between General and Technical communication; Language as a tool of communication; The process of communication and factors that influence communication sender, receiver, channel, code, topic, message, context, feedback, noise, filters & barriers Levels of communication: Interpersonal, Organizational, Mass communication; The flow of Communication: Downward, Upward, Lateral or Horizontal (Peer group); Listening - Introducing learners to GIE - Types of listening. Speaking - Speaking about one's place, important festivals etc. – Introducing oneself, one's family / friend; Reading - Skimming a reading passage – Scanning for specific information - Note-making; Writing - Free writing on any given topic (My favourite place / Hobbies / School life, etc.) - Sentence completion - Autobiographical writing (writing about one's leisure time activities, hometown, etc.); Grammar - Prepositions - Reference words - Wh-questions - Tenses (Simple); Vocabulary - Word formation - Word expansion (root words / etymology); E-materials - Interactive exercises for Grammar & Vocabulary - Reading comprehension exercises - Listening to audio files and answering questions.

UNIT II

Listening - Listening and responding to video lectures / talks; Speaking - Describing a simple process (filling a form, etc.) - Asking & answering questions - Telephone skills – Telephone etiquette; Reading– Critical reading - Finding key information in a given text - Sifting facts from opinions; Reading - Email communication - Reading the attachment files having a poem/joke/proverb - Sending their responses through email Enriching Language through Literature Poems- *If* by Rudyard Kipling, *I know why the caged bird sings* by Maya Angelou , Short Stories -*The Eyes Are Not Here* by Ruskin Bond, *Bhagvat Gita on Effective Leadership* by Poojan Roka Grammar - Direct and indirect speech; Writing - Creative writing, Poster making; Writing - Biographical writing (place, people) , Grammar - Use of imperatives - Subject-verb agreement.

UNIT III

Listening - Listening to specific task - focused audio tracks; Speaking - Role-play – Simulation, Group interaction Speaking in formal situations (teachers, officials, foreigners); Reading and interpreting visual material; Writing Jumbled sentences - Coherence and cohesion in writing - Channel conversion (flowchart into process) - Types of paragraph (cause & effect / compare & contrast / narrative / analytical) - Informal writing (letter/e-mail/blogs) Paraphrasing; Grammar - Tenses (Past) - Use of sequence words - Adjectives; Conditionals, Vocabulary, Different forms and uses of words, E-materials - Interactive exercises for Grammar and Vocabulary - Excerpts from films related to the theme, Varieties of Spoken English: Standard Indian, American and British. E-materials - Interactive exercises for Grammar and Vocabulary - Listening exercises with sample telephone conversations / lectures, Picture-based activities. Prefix and Suffix; Synonyms and Antonyms;

UNIT IV

Listening - Watching videos / documentaries and responding to questions based on them; Speaking Responding to questions - Different forms of interviews - Speaking at different types of interviews; Reading Making inference from the reading passage - Predicting the content of a reading passage; Writing , Interpreting visual materials (line graphs, pie charts etc.) - Essay writing – Different types of essays; Grammar - Adverbs Tenses, future time reference; Negation, Phrasal verbs, Vocabulary - Single word substitutes. Use of abbreviations & acronyms; E-materials - Interactive exercises for Grammar and Vocabulary-Sending emails with attachment, Audio / video excerpts of different accents, Vocabulary - Lexical items (fixed / semi fixed expressions). Sample interviews, film scenes - dialogue writing. Listening to Speeches / Presentations, Listening to broadcast & telecast from Radio & TV; Speaking - Giving impromptu talks, Making presentations on given topics.

TEXT BOOKS

1. Mindscapes: English for Technologists and Engineers, Orient Black Swan, 2012.
2. S. P. Dhanavel, English and Communication Skills for Students of Science and Engineering. Orient Black Swan, Chennai, 2011.
3. Raman, Meenakshi and Sangeeta Sharma. *Technical Communication: Principles and Practice*. Oxford Publications.
4. Connor, J.D.O. *Better English Pronunciation*.

REFERENCE BOOKS

1. Pickett, Nell Ann, Ann A. Laster and Katherine E. Staples. *Technical English: Writing, Reading and Speaking*. New York: Longman, 2001.
2. Bailey, Stephen. *Academic Writing: A practical guide for students*. New York: Rutledge, 2011.
3. Morgan, David and Nicholas Regan. *Take-Off: Technical English for Engineering*. Reading: Garnet Publishing Limited, 2008.
4. Thorn, Michael and Alan Badrick. *An Introduction to Technical English*. Harlow: Prentice Hall Europe, 1993.
5. Rizvi, M.Ashraf. *Effective Technical Communication*. New Delhi: Tata McGraw-Hill Publishing Company, 2007.

Engineering Mathematics-I

BT EMA 102

UNIT I

Inverse and Rank of a matrix, Eigenvalues and Eigenvectors of a real matrix, Characteristic equation, Properties of eigenvalues and eigenvectors Cayley-Hamilton Theorem, Diagonalization of matrices, Reduction of a quadratic form to canonical form by orthogonal transformation, Nature of quadratic forms.

UNIT II

Sequences, Convergence of series, General properties, Series of positive terms, Tests of convergence (Comparison test, Integral test, Comparison of ratios and D' Alembert's ratio test), Alternating series, Series of positive and negative terms, Absolute and conditional convergence.

UNIT III

Partial derivatives, Homogeneous functions and Euler's theorem, Total derivative, Differentiation of implicit functions, Change of variables, Jacobians, Partial differentiation of implicit functions, Taylor's series for functions of two variables, Errors and approximations, Maxima and minima of functions of two variables, Lagrange's method of undetermined multipliers.

UNIT IV

Beta and Gamma functions, Properties, Evaluation of integrals using Beta and Gamma functions. Double integrals, Change of order of integration, Double integrals in polar coordinates, Area enclosed by plane curves, Triple integrals Volume of Solids, Change of variables in double and triple integrals, Area of a curved surface.

TEXT BOOKS

1. Grewal B.S., "Higher Engineering Mathematics", Khanna Publishers, New Delhi, 40th Edition, 2007.
2. Ramana B.V., "Higher Engineering Mathematics", Tata McGraw Hill Co. Ltd., New Delhi, 11th Reprint, 2010.

Engineering Physics-I

BT EPH-103

UNIT I INTERFERENCE AND DIFFRACTION

Interference: Division of wave front, Fresnel biprism, Division of amplitude, Newton rongs, Michelson interferometer and its applications.

Diffraction: Difference between Fraunhofer and Fresnel diffraction, Fraunhofer diffraction at a slit, Plane transmission diffraction grating, its dispersive and resolving powers.

UNIT II POLARIZATION AND DIELECTRICS

Polarization: Polarized and unpolarized light, double refraction, Nicol Prism, quarter and half wave plates, Polarimetry, Biquartz and Laurent's half-shade polarimeters. Simple concepts of Photoelasticity.

DIELECTRICS: Polarization, displacement, susceptibility, dielectric coefficient, permittivity & various relations between them, Energy stored in electric field, Behavior of dielectric in AC fields-simple concepts, dielectric losses, Applications of dielectrics.

UNIT III MODERN PHYSICS-I

QUANTUM PHYSICS: Drawbacks of Classical Physics, Introduction to quantum mechanics, simple concepts, discovery of Planck's Constant, Group velocity and phase velocity, Schrödinger wave equation, Postulates of quantum mechanics, Time dependent and time independent Schrödinger wave equation, Uncertainty principle, Eigen values, Elementary ideas of quantum statistics.

X-RAYS: Production of X-rays, continuous and characteristics X-ray, Mosley Law, absorption and diffraction of X-ray, Bragg's law and its applications, Methods of X-ray diffraction, Compton scattering.

UNIT IV MODERN PHYSICS-II

SPECIAL THEORY OF RELATIVITY: The Michelson-Morley experiment, relativistic transformation, length contraction, time delation, variation of mass with velocity, mass-energy equivalence.

NUCLEAR ENERGY: Nuclear fission, moderators, nuclear reactors, reactor criticality & neutron cross-section, nuclear fusion; interaction of radiation with matter (basic concepts), Radiation Detectors-ionization chamber, G.M. Counter, scintillation and solid state detectors, cloud chamber and bubble chamber.

SUGGESTED BOOKS

Optics	-	F.W. Sears
Physics of the Atom	-	Wehr, Richard & Adair
Perspectives of Modern Physics -		Arthur Beiser
Physics-I, II	-	Halliday and Resnick
Engineering Physics	-	Engineering Physics

Engineering Chemistry-I

BT ECH-104

UNIT I

Chemical Kinetics: Second order reactions, derivation of velocity constant with same and different concentrations of the reactants, half-life period, basic concepts of Complex reactions, and determination of rate constant, collision theory and absolute reaction rate theory.

Corrosion and its prevention: Galvanic & concentration cell, dry and wet corrosion, Electrochemical theory of corrosion, Galvanic corrosion, Pitting corrosion, differential aeration corrosion, water line corrosion, stress corrosion, factor effecting corrosion, Preventing measures (design, Cathodic protection, modification of environment and protective coatings).

UNIT II

Photochemistry: Photochemical and dark reactions, laws of photochemistry, Quantum efficiency, classification of photochemical reactions on the basis of their quantum efficiencies, Non-radiative processes (isc and ic), fluorescence, phosphorescence (Jablonski diagram), Chemiluminiscence and photosensitization, technology based on photochemical processes.

Phase Rule: Description of various terms (phase, component and degrees of freedom). One component system (water and sulphur systems), freeze drying, Two components system with simple eutectic formation (Pb-Ag and KI-H₂O), solder, safety plugs and freezing mixtures.

UNIT III

Organic Chemistry: Reaction intermediate (carbocations, carbanions, carbenes and free radicals), aromaticity and Huckel treatment of organic compounds, nucleophilic substitutions and elimination reactions mechanism (E1, E2, SN1 and SN2).

Bioorganic chemistry: Elementary knowledge of enzymes and coenzymes, Carbohydrates, proteins, lipids.

UNIT IV

Coordination chemistry: coordination compounds, various theories of bonding: Ligand field theory, crystal field theory, molecular orbital theory, determination of CFSH of few complex compounds (octahedral compounds), important applications of coordination compounds. **Analytical methods:** Thermal methods; Principle, method and application of TGA,DTA & DSC, interaction of electromagnetic radiation with a molecule and origin of spectrum, Vibrational & electronic spectra (Experimental details are excluded), spectrophotometry, conductometric titrations, elementary discussion on Flame-photometry.

BOOKS RECOMMENDED

1. Concise Inorganic Chemistry, J D Lee
2. Reaction Mechanism in Organic Chemistry. S M Mukherji, S P Singh.
3. Principles of Instrumental Analysis, D.A. Skoog, F.J. Holler, and S.R. Crouch.
4. Instrumental methods of Chemical Analysis, Meritt & Willard
5. Principles of Physical Chemistry, B R Puri, L R Sharma and M S Pathania.
6. Physical Chemistry, P.W. Atkins (ELBS, Oxford Press).
7. Physical Chemistry, W.J. Moore (Orient-Longman).

Engineering Drawing

BT EGD-105

Concepts and conventions (Not for Examination)

Importance of graphics in engineering applications – Use of drafting instruments – BIS conventions and specifications. Size, layout and folding of drawing sheets – Lettering and dimensioning.

UNIT I PLANE CURVES AND FREE HAND SKETCHING

Basic Geometrical constructions, Curves used in engineering practices: Conics – Construction of ellipse, parabola and hyperbola by eccentricity method – Construction of cycloid – construction of involutes of square and circle Drawing of tangents and normal to the above curves, **Scales:** Construction of Diagonal and Vernier scales.

Visualization concepts and Free Hand sketching: Visualization principles – Representation of Three Dimensional objects, Layout of views- Free hand sketching of multiple views from pictorial views of objects.

UNIT II PROJECTION OF POINTS, LINES AND PLANE SURFACES

Orthographic projection- principles-Principal planes-First angle projection-Projection of points. Projection of straight lines (only First angle projections) inclined to both the principal planes - Determination of true lengths and true inclinations by rotating line method and trapezoidal method and traces Projection of planes (polygonal and circular surfaces) inclined to both the principal planes by rotating object method.

UNIT III PROJECTION OF SOLIDS

Projection of simple solids like prisms, pyramids, cylinder, cone and truncated solids when the axis is inclined to one of the principal planes by rotating object method and auxiliary plane method.

PROJECTION OF SECTIONED SOLIDS AND DEVELOPMENT OF SURFACES: Sectioning of above solids in simple vertical position when the cutting plane is inclined to the one of the principal planes and perpendicular to the other – obtaining true shape of section. Development of lateral surfaces of simple and sectioned solids – Prisms, pyramids cylinders and cones. Development of lateral surfaces of solids with cut-outs and holes.

UNIT IV ISOMETRIC AND PERSPECTIVE PROJECTIONS

Principles of isometric projection – isometric scale –Isometric projections of simple solids and truncated solids - Prisms, pyramids, cylinders, cones- combination of two solid objects in simple vertical positions and miscellaneous problems. Perspective projection of simple solids-Prisms, pyramids and cylinders by visual ray method and vanishing point method.

TEXT BOOK: N.D.Bhatt and V.M.Panchal, “Engineering Drawing”, Charotar Publishing House, 50th, 2010.

REFERENCES:

1. K.R.Gopalakrishna., “Engineering Drawing” (Vol I&II combined) Subhas Stores, Bangalore, 2007
2. M.B.Shah and B.C.Rana, “Engineering Drawing”, Pearson, 2nd Edition, 2009
3. K.Venugopal and V.Prabhu Raja, “Engineering Graphics”, New Age International Limited ,2008.
4. K. V.Natrajan, “A text book of Engineering Graphics”, Dhanalakshmi Publishers, Chennai, 2009.
5. Basant Agarwal and Agarwal C.M., “Engineering Drawing”, Tata McGraw Hill Publishing Company Limited, New Delhi, 2008.

Essentials of Information Technology and Computer Programming

BT EIT-106

UNIT - I

An Overview of Computer System, Anatomy of a digital Computer, Memory Units, Main and Auxiliary Storage Devices, Input Devices, Output Devices, Classification of Computers. Operating System Basics, The user Interface, Running Programmes, Managing files, Introduction to PC operating Systems: Unix/Linux, DOS, Windows 2000.

Programming Languages, Machine, Assembly, and High Level Languages, Assembler, Compiler, Interpreter, debuggers, Programming fundamentals: problem definition, algorithms, flow charts and their symbols, introduction to compiler, interpreter, assembler, linker and loader and their inter relationship.

UNIT - II

Computer Networks: Basic concepts of Computer Networks, Network Topologies: Bus, Star, Ring, Hybrid, Tree, Complete, Irregular; Types of Networks: LAN, MAN and WAN.

Network Applications- Internet: Introduction, Internet basic, Internet protocols, Internet addressing, Browser WWW, E-mail, telnet, ftp, application, benefits and limitation of internet, electronic conferencing, and teleconferencing.

Latest IT Trends:-e-Commerce, M-Commerce, Artificial Intelligence, Computational Intelligence, Geographic Information System (GIS), Data Mining, Role of IT in different Area - Education, Industry, Banking, Marketing, Public Services and others.

UNIT- III

C Programming language, C fundamentals, formatted input/ output, Declaration: Declaration syntax, types qualifiers, declarators, initializers, expressions, selection statements, loops and their applications; Basic types, storage classes, arrays, functions, including recursive functions, program organization: local and external variables and scope; pointers and arrays, Strings: strings literals, string variables, I/O of strings, arrays of strings; applications. Preprocessor: preprocessor directives, macro definition, conditional compilation.

UNIT - IV

Structures, Unions and Enumerations: Structure variables and operations on structures; Structured types, nested array structures; unions; enumeration as integers, tags and types. File handling. Program Design: modules, information hiding, abstract data types, difference between C & C++, Low level programming: Bitwise operators, Bit fields in structures, other low level techniques. Standard library: Input / output; streams, file operations, formatted I/O, character I/O, line I/O, block, string I/O, Library support for numbers and character data, error handling.

Text and Reference Books:

1. Using Information Technology, 5th Edi, Brian K Williams & Stacey C. Sawyer, 2003, TMH
2. The C Programming Language by Dennis M Ritchie, Brian W. Kernigham, 1988, PHI.
3. Information technology, Dennis P. Curtin, Kim Foley, Kunal Sen, Cathleen Morin, 1998, TMH
4. Teach yourself all about computers by Barry Press and Marcia Press, 2000, IDG Books India.
5. Using Computers and Information by Jack B. Rochester, 1996, Que Education & Training.
6. Fundamentals of IT: Leon and Leon; Leon Tec World
7. Fundamentals of Information Technology, Alexis Lean and Mathews Leon, Vikas Publication House, Delhi
8. Information Technology-inside and outside, Cyganski, Pearson Publication
9. Introduction to computer Science, ITL ESL, Pearson Education
10. Y. Kanetkar, Let us C, BPB Publications.
11. Programming in ANSI C by E Balaguruswami, Tata McGraw Hill
12. Schaum's Outline of Theory and Problems of programming with C, B.S.Gottfried,McGraw-Hill.

Physics Laboratory-I

PHL-107

List of Experiments

1. Torsional pendulum: Determination of rigidity modulus of wire and moment of inertia of disc.
2. Non-uniform bending: Determination of young's modulus.
3. Lee's disc: Determination of thermal conductivity of a bad conductor.
4. Potentiometer: Determination of thermo e. m. f. of thermocouple.
5. Air wedge: Determination of thickness of a thin sheet of paper.
6.
 - a) Optical fibre: Determination of Numerical Aperture and acceptance angle.
 - b) Compact disc: Determination of width of the groove using laser.
7. Acoustic grating: Determination of velocity of ultrasonic waves in liquids.
8. Post office box: Determination of Band gap of a semiconductor.
9. Spectrometer: Determination of wavelength using grating.
10. Viscosity of liquids: Determination of co-efficient of viscosity of a liquid by Poiseuille's flow.

Chemistry Laboratory-I

BT CHL-108

List of Experiments

1. Determination of the strength (g/L) of Cu (II) ions present in a given copper ore Solution iodometrically.
2. Determination of the strength (g/L) of Fe (II) and Fe(III) ions present in a given iron ore solution by internal indicator method.
3. Determination of the rate constant for 2nd order reaction.
4. Determination of manganese dioxide in pyrolusite.
5. Estimation of nickel by gravimetric method as bis (dimethylglyoximate)nickel(II).
6. Determination of the strength (g/L) of weak acid using conductometric titration method.
7. Determination of the strength (g/L) of strong acid using conductometric titration method.
8. Identification of types of carbohydrates in a given sample.
9. Test for proteins and lipids.
10. Synthesis of nanomaterials and their characterization.
11. Determination of the composition of a liquid mixture by surface tension method using stalagmometer.

Computer Programming Laboratory

CPL-109

Note: Students have to implement at least 10 programs in the computer lab.

1. Write a program to swap two integer numbers.
2. Write a program to find the largest of three numbers.(using if-then-else)
3. Write a program to find roots of quadratic equation using switch statement.
4. Write a program to calculate factorial of a number using while loop, do while loop and for loop.
5. Write a program to insert and element in an array and delete an element.
6. Write a program to multiply two matrices using two dimensional array.
7. Write a program to read a string and write it in reverse order.
8. Write a program to generate Fibonacci series using function.
9. Write a program using structure to enter a list of books, their prices and number of pages.
10. Write a program that dynamically allocates (use of pointer) a structure which has student name, age, roll no information.
11. Write a program to show the use of union in c.
12. Write a program to show the use of enumeration data types in c.

Syllabus
B. Tech. (All Branches)
First Year, Second Semester
Session 2016-2017

Communication Skills-II

BT HUM-202

Unit-I

The Organs of Speech, Phonetic Symbols, Speech Sounds – Vowels and Consonants, Listening: Listening to informal conversations and participation Speaking - Opening a conversation, (greetings, comments on something, weather) - Turn taking - Closing a conversation (greetings, excuses, general wish, positive comment, thanks), Speaking - Conversation skills with a sense of stress, intonation, pronunciation and meaning- Seeking information – expressing feelings (affection, anger, apology, concern, extempore etc.)

Unit-II

Vocabulary - Idioms and their meanings – using idioms in sentences; E-materials - Interactive exercises on Grammar & Vocabulary - Different forms of résumés- Filling up a résumé / cover letter, Discussing various aspects of a film (they have already watched) or a book (they have already read); Reading- Reading a short story or an article from newspaper, Critical reading, Comprehension skills, Language Lab - Intonation practice using standard materials – Attending a meeting and writing minutes.

Unit-III

Formal and informal letter writing: Business letters/ Minutes, Grammar - Regular & irregular verbs - Active and passive voice; Vocabulary Homonyms, Homophones Synonyms, Antonyms, Language Lab - Listening to different types of conversation and answering questions. Types of reports – Feasibility / Project report – report format – recommendations / suggestions – interpretation of data (using charts for effective presentation); Blog Writing & Tweet comments

Unit-IV

Interview Techniques/Mock Interview, Netiquette: Effective E-mail Communication; KOPPACT non-verbal communication, Team Management & Time Management, Hot Seat Task & Effective Customer Care for Fluency in English, Grammar - Use of clauses; Vocabulary – Collocation; E-materials - Interactive grammar and vocabulary exercises - Sample GD - Pictures for discussion.

Suggested Readings:

- 1) Balasubramanian. T. *A Text Book of English Phonetics for Indian Students*. India: Macmillan, 1981.
- 2) Taylor, Shirley. *Communication for Business: A Practical Approach*. Pearson Longman, 2005.
- 3) Mindscapes: English for Technologists and Engineers, Orient Black Swan, 2012.
- 4) Sethi, J. & P. V. Dhamija. *A Course in Phonetics and Spoken English*. Prentice Hall: India, 2000.

Reference Books:

- 1) Bansal R.K. & Harrison: *Phonetics in English*, Orient Longman, New Delhi.
- 2) Crystal, D. *English as a Global Language*. Cambridge: Cambridge University Press, 1997.
- 3) Joans Daniel. *English Pronouncing Dictionary*, Cambridge Univ. Press.
- 4) Krishnaswamy, N & Lalitha Krishnaswamy. *Story of English in India*. New Delhi: Foundations Books Pvt. Ltd, 2006.

- 5) Lesikar, Raymond V., & John D. Pettit, Jr. *Report Writing for Business*. Tenth Edition. Delhi: McGraw-Hill, 1998.
- 6) McCarthy, Patsy & Caroline Hatcher. *Presentation Skills*. London: Sage, 2010.

Extensive Readings:

- 1) Isaacson, Walter. *Steve Jobs: The Man Who Thought Different*. Simon & Schuster, 2011.
- 2) Kalam, APJ Abdul. *Forge Your Future*. New Delhi: Rajpal & Sons, 2014.
- 3) Sharma, Robin. *The Monk Who Sold His Ferrari*. Harpersanfrancisco, 1999.
- 4) Vujicic, Nick. *Life Without Limits: Inspiration for a Ridiculously Good Life*. RHUS, 2012.

Websites Resources

<http://takeielts.britishcouncil.org/prepare-ielts/free-ielts-online-course>

<http://learnenglish.britishcouncil.org/en/>

<https://www.youtube.com/user/BCIELTS>

Cambridge Dictionaries Online. 2013. Retrieved 28 October 2013.

<http://dictionary.cambridge.org/dictionary/british/>

Oxford Advanced Learner's Dictionary. 2013. Retrieved 28 October 2013.

<http://oald8.oxfordlearnersdictionaries.com>

Rusbult, C. (2009) Conversational Skills for ESL. Retrieved from :

<https://mywebspace.wisc.edu/crusbult/web/teach/esl.htm>

Engineering Mathematics-II

BT EMA 202

UNIT I: DIFFERENTIAL EQUATIONS

Linear differential equation with constant coefficients, Cauchy homogeneous differential equation, Method of variation of parameters, change of independent variable, removal of first order derivative, System of simultaneous linear differential equations with constant coefficients.

UNIT I: VECTOR CALCULUS

Gradient and directional derivative – Divergence and Curl, Line integral over a plane curve – Surface integral and volume integral - Green's, Gauss divergence and Stoke's theorems, Verification and application in evaluating line, surface and volume integrals.

UNIT III: COMPLEX INTEGRATION

Analytic functions, Necessary and sufficient conditions for analyticity, Harmonic conjugates, Construction of analytic function. Line integral, Cauchy's integral theorem, Cauchy's integral formula, Taylor's and Laurent's series, Singularities, Residues, Residue theorem, Application of residue theorem for evaluation of real integrals.

UNIT IV: LAPLACE TRANSFORMS

Definition, Existence conditions, Laplace Transforms of elementary functions, Laplace Transform of unit step function and unit impulse function, Shifting theorems, Laplace Transforms of derivatives and integrals, Initial and final value theorems, Inverse Laplace transforms, Convolution theorem, Laplace Transform of periodic functions, Application to solution of linear ordinary differential equations with constant coefficients.

TEXT BOOKS

3. Grewal B.S., "Higher Engineering Mathematics", Khanna Publishers, New Delhi, 40th Edition, 2007.
4. Ramana B.V., "Higher Engineering Mathematics", Tata McGraw Hill Co. Ltd., New Delhi, 11th Reprint, 2010.

REFERENCES

1. Glyn James, "Advanced Modern Engineering Mathematics", Pearson Education, New Delhi, 2007.
2. Jain R.K. and Iyengar S.R.K., "Advanced Engineering Mathematics", Narosa Publications, Delhi, 3rd
3. Peter V.O'Neil, Advanced Engineering Mathematics, Cengage Learning India Pvt., Ltd, New Delhi, 2007.

Engineering Physics-II

BT EPH 203

UNIT-I : SOLID STATE PHYSICS

CRYSTAL STRUCTURE: Space Lattice, unit cell and translation vectors; Miller indices, Simple and closed packed crystal structures with examples, Defects in solids

FREE ELECTRON THEORY: Elements of classical free electron theory and its limitations, quantum theory of free electrons, Fermi level, Density of states, Fermi-Dirac distribution function, Thermionic emission, Richardson's equation.

UNIT-II

BAND THEORY OF SOLIDS: Origin of energy bands, Kronig Penney Model (qualitative), E-K diagram, Brillouin Zones, Concept of effective mass and holes, Classification into metals, Semiconductors and insulators, Fermi energy and its variation with temperature, Hall effect and its applications specific heat of solids, classical, Einstein and Debye Model.

UNIT-III

MAGNETIC PROPERTIES OF SOLIDS: Atomic magnetic moments, orbital diamagnetism, classical theory of paramagnetism, ferro magnetism, molecular field theory and domains.

SUPERCONDUCTIVITY: Experimental facts, Type I and II superconductors, London equation, Applications of superconductivity

ELEMENTS OF NANOTECHNOLOGY: Introduction to nanoscience and technology, concept of quantum size effect, quantum dots, Nanomaterials: top down and bottom up techniques, Applications of nanotechnology.

UNIT-IV MODERN OPTICS

LASERS AND FIBRE OPTICS: Spontaneous and stimulated emission; Relation between Einstein coefficients of stimulated and spontaneous emission, Characteristics of laser beam, He-Ne, semiconductor and CO₂ lasers, Applications of lasers in industry and medicine. Propagation of light in fibres; numerical aperture, single mode and multi mode fibres, applications of optical fibre in industry and communication.

SUGGESTED BOOKS:

- | | | |
|-------------------------------------|---|------------------------|
| Introduction to Solid State Physics | - | Charles Kittel |
| Solid State Physics | - | S.O. Pillai |
| Lasers: Theory and Applications | - | Thyagarajan and Ghatak |

Nanotechnology-Basic Science and Emerging Technologies- Mick Wilson, Kamali Kannangra Geoff Smith, Michelle Simons and Burkhard Raguse, Overseas Press.

ENGINEERING CHEMISTRY-II

BT ECH 204

UNIT I

Water Treatment-I- Hardness of water and its determination, units of hardness, alkalinity of water and its determination, related numerical problems, water softening, Ion-exchange process, mixed bed demineralisation, desalination of water by using different methods.

Water Treatment-II: Preparation of polished (intrinsic) water to be used for electronics devices, Problems faced during the course of steam generation in boilers: scale and sludge formation, priming and foaming and boiler corrosion, Determination and significance of DO, BOD and COD.

UNIT II

Polymers and Polymerization: Organic polymers, polymerization, various types of polymerization, effect of structure on properties of polymers, preparation, properties and technical/industrial applications of thermoplastics (PE, PVC, PVA, Teflon), thermosets (PF, UF & MF) and elastomers (Synthetic Rubber including SBR, Buna-S, Buna-N, Thiokol & Polyurethanes), Inorganic polymers: Silicones, preparation, properties & industrial application.

Composite Materials & their application: optical fibers, fullerenes, organic electronic material, composite materials & their classification, constituents of composites, role of interface in composite performance and durability, fiber-Reinforced composite, advantage and applications of composites.

UNIT III

Lubricants: Introduction and classification of lubricants, determination and significance of properties of oils (viscosity, viscosity index, acid value, saponification value, iodine value, pour point, cloud point, aniline point), greases, solid lubricants.

Fuels: Calorific value (HCV and LCV), determination of HCV by Bomb Calorimeter, proximate and ultimate analysis of coal. Coal liquefaction (Bergius and Fischer-Tropsch methods). Coal gasification (water gas and coal gas).

UNIT IV

Inorganic Engineering Materials: Cement-composition and setting of cement; Glass-composition, properties, manufacture and types of glasses; Explosives: Introduction, classification, requisites of explosives, plastic explosives, RDX, TNT and PETN.

Nanochemistry: Introduction, general methods of synthesis, characterization and Applications of nano materials.

BOOKS RECOMMENDED

1. Concise Inorganic Chemistry, J D Lee
2. Principles of Instrumental Analysis, D.A. Skoog, F.J. Holler, and S.R. Crouch,
3. Instrumental methods of Chemical Analysis, Meritt & Willard
4. Chemistry in Engineering and Technology, T Raja Ram and J C Kuriascose

Manufacturing Processes

BT MP 205

Note: The use of scientific calculator will be allowed in the examination. However, programmable calculator and cellular phone will not be allowed.

UNIT-I

Introduction: Introduction to Manufacturing Processes and their Classification. Industrial Safety: Introduction, Types of Accidents, Causes and Common Sources of Accidents, Methods of Safety, Electric Safety Measures, First Aid.

Engineering Materials: General Properties and Application of Engineering Materials, Cast Iron, Mild Steel, Medium Carbon Steel, High Carbon steel and High Speed Steel, Non-Ferrous Materials, Shop's Tools Materials, Super Alloys or High Temperature Materials

UNIT-II

Foundry: Introduction to Casting Processes, Basic Steps in Casting Process, Pattern, Types of Patterns, Pattern Allowances, Risers, Runners, Gates, Molding Sand and its Composition, Sand Preparation, Molding Methods, Core Sands and Core Making, Core Assembly, Mold Assembly, Melting (Cupola) and Pouring, Fettling, Casting Defects and Remedies.

Cold Working (Sheet Metal Work): Sheet Metal Operations, Measuring, Layout Marking, Shearing, Punching, Blanking, Piercing, Forming, Bending and Joining- Advantages and Limitations.

UNIT-III

Hot Working Processes: Introduction to Hot working, Principles of Hot Working Processes, Forging, Rolling, Extrusion, Wire Drawing.

Introduction to Machine Tools: Specifications and Uses of Commonly used Machine Tools in a Workshop such as Lathe, Shaper, Planer, Milling, Drilling, Slotter. Introduction to Metal Cutting Nomenclature of a Single Points Cutting Tool and Tool Wear, Mechanics of Chips Formations, Type of Chips, Use of Coolants in Machining.

UNIT-IV

Welding: Introduction to welding, Classification of Welding Processes, Gas Welding: Oxy-Acetylene welding, Resistance welding; Spot and Seam welding, Arc Welding: Metal Arc, TIG and MIG Welding, Welding Defects and Remedies, Soldering and Brazing, Surface Finishing Processes.

Plant Layout: Plant Layout, Objectives of Layout, Types of Plant Layout and their advantages.

Text and Reference Books:

1. Hazra and Chaudhary, "workshop Technology", Volume I and II, Asian Book Company, New Delhi.
2. Lindberg, R.A., "Process and Materials of Manufacture", Prentice Hall of India, New Delhi.
3. Campbell. J.S., "Principles of Manufacturing and Processes", McGraw-Hill.
4. Amitabh Ghosh and Ashok Kumar Malik, "Manufacturing Science", East-West Press.
5. Ostwald, M, "Manufacturing Process and Systems", John Wiley.
6. Chapman, W.A.J., "Workshop Technology", Volume I,II, and III, Edward A.

Principles of Electrical and Electronics

BT PEE 206

UNIT I ELECTRICAL CIRCUITS

Basic principles involved in power generation, transmission and use – Ohms Law Kirchoff's Law – steady state solution of DC circuits – Theorem: Thevenin's, Norton's and Superposition Theorems. Introduction to AC circuits – waveforms and RMS value – power and power factor, single phase and three-phase balanced circuits, housing wiring, industrial wiring, materials of wiring.

UNIT II ELECTRICAL MACHINES

Principles of operation and characteristics of DC machines. Transformers (single and three-phase) synchronous machines – three-phase and single-phase induction motors – (op. Principles).

UNIT III ELECTRONIC DEVICES & CIRCUITS

Types of Materials –Silicon & Germanium N type and P type materials, PN Junction –Forward and Reverse Bias, Semiconductor Diodes, Rectification, Bipolar Junction Transistor, Characteristics – transistor as an Amplifier, Introduction to operational Amplifier, Inverting Amplifier, Non Inverting Amplifier, DAC, ADC.

UNIT IV MEASUREMENTS & INSTRUMENTATION

Introduction to transducers: pressure, temperature, position, electrical measurements - Classification of instruments, moving coil and moving iron, Ammeter and Voltmeter, multimeters, dynamometer type Wattmeter, three-phase power measurements, energy meter, megger, instrument transformer (CT and PT) .

REFERENCES

1. Del Toro, "Electrical Engineering Fundamentals", Pearson Education, New Delhi, 2007.
2. John Bird, "Electrical Circuit Theory and Technology", Elsevier, First Indian Edition, 2006.
3. Allan S Moris, "Measurement and Instrumentation Principles", Elsevier, First Indian Edition, 2006.
4. Rajendra Prasad, "Fundamentals of Electrical Engineering", Prentice Hall of India, 2006.
5. Thereja .B.L., "Fundamentals of Electrical Engineering and Electronics", S. Chand & Co. Ltd., 2008.
6. Sanjeev Sharma, "Basics of Electrical Engineering", S.K International Publishers, New Delhi, 2007.
7. V.K Mehta and Rohit Mehta, "Principle of Electrical Engineering", S. Chand & Company, 2008.

Physics Laboratory-II

BT PHL 207

EXPERIMENTS

1. To calibrate an electromagnet using Guoy's balance.
2. To measure Hall's co-efficient of Germanium and calculation of charge carrier concentration.
3. To measure i) Saturation magnetization ii) coercivity and iii) retentivity in a given ferromagnetic material.
4. To measure the velocity of ultrasonic waves in organic liquids.
5. To verify Richardson's thermionic emission equation.
6. To study the decay of charge on a capacitor and to find its capacitance.
7. To determine e/m of an electron.
8. To study I/V characteristics and rectification properties of a semiconductor diode.
9. To study characteristics of a thermistor.
10. To determine the resistivity of a semiconductor by four probe method.
11. To determine the band gap of germanium from the variation of its resistivity with temperature.
12. To study the intensity response of a cadmium sulphide cell.
13. To study a G.M. counter.
14. To draw the I-V characteristics of a solar cell under constant illumination.

NOTE: Students are required to do any ten experiments.

Chemistry Laboratory-II

BT CHL 208

List of Experiments:

1. Determination of nitrite ions present in tap water.
2. Determination of alkalinity of irrigation water.
3. Determination of D.O. in the given sample of water.
4. Determination of total hardness, calcium and magnesium hardness of water by EDTA titration method.
5. Determination of calcium as calcium oxide volumetrically in cement extract solution.
6. Determination of viscosity of lubricants by Redwood viscometer.
7. Determination of acid value of oil.
8. Determination of saponification value of oil.
9. Determination of iodine value of oil.
10. Determination of flash point of lubricant.
11. Determination of cloud and pour point of lubricant.
12. Preparation of (a) Phenol-formaldehyde resin and (b) urea-formaldehyde resin.
13. Determination of nitrogen and Sulphur in coal.

NOTE: Students are required to do any ten experiments.

Electrical and Electronics Laboratory

BT EEL 209

List of Experiments:

1. To verify KCL and KVL.
2. To verify Thevenin's and Norton theorem
3. To verify Superposition theorem.
4. To perform direct load test of a transformer and plot efficiency Vs load characteristic.
5. To perform direct load test of a D.C. shunt generator and plot load voltage Vs load current curve.
6. To perform O.C. and S.C. tests of a transformer.
7. To study various type of meters.
8. Measurement of power by 3 voltmeter / 3 Ammeter method.
9. Measurement of power in a 3-phase system by two wattmeter method.
10. Plot the forward and reverse V-I Characteristics of a PN junction Diode.
11. To plot and study the input and output characteristics of BJT in Common Emitter Configuration.
12. To Study Half – Wave and full Wave Rectifier with regulation and ripple factor.

NOTE: Students are required to do any ten experiments.

Computational Technology Laboratory

BT CTL 210

Section A

1. Write a C program to enter marks of five subjects and calculate total, average and percentage.
2. Write a C program to enter P, T, R and calculate Compound Interest.
3. Write a C Program to Find GCD of two Numbers.
4. Write a C Program to Find Factorial of a Number Using Recursion.
5. Write a C Program to Access Elements of an Array Using Pointer.
6. Write a C Program to Copy String Without Using strcpy ().
7. Write a C Program to Store Information Using Structures with Dynamically Memory Allocation.
8. Write a C Programming Code To Create Pyramid and Pattern.

Section B

1. Write an HTML code to display your education details in a tabular format.
2. Write an HTML code to display your CV on a web page (Paragraph formatting).
3. Write an HTML code to create a Home page having three links: About Us, Our Services and Contact Us. Create separate web pages for the three links.
4. Write an HTML code to create a login form. On submitting the form, the user should get navigated to a profile page.
5. Write an HTML code to illustrate the usage of the following:
 - Ordered List
 - Unordered List
 - Definition List
6. Write an HTML code to create a frameset having header, navigation and content sections.
7. Write an HTML code to demonstrate the usage of inline CSS.
8. Write an HTML code to demonstrate the usage of internal CSS.
9. Write an HTML code to demonstrate the usage of external CSS.

Section C

- Make a Calculator Using C.
- Write an HTML code to create your Institute website, Department Website and Tutorial website for specific subject.

Workshop Technology Lab

BT WTL 211

Lab Contents

I-Machine Shop

1. To prepare a job involving V-groove, slot cutting etc. on Shaper Machine.
2. To prepare a job on the Lathe Machine involving facing, turning, step turning and taper turning.
3. To prepare a job involving side and face milling on Milling Machine.

II- Welding Shop

4. Practice of arc welding, gas welding, MIG welding and TIG welding.
5. To prepare butt and lap joints using Electric Arc Welding.

III- Fitting Shop

6. To study different type of measuring/marketing/fitting tools used in fitting shop and determine least count of Vernier Calliper and Micrometer.
7. To prepare a job involving cutting, marking, filling, drilling etc.

IV- Foundry Shop

8. To prepare a mould assembly using single piece pattern.
9. To prepare a mould and core assembly using split pattern for casting.

V- Carpentry Shop

10. To study different types of tools and woods used in carpentry shop.
11. To prepare at least two simple wooden joints like Cross-lap Joint, Dovetail joint, T-joint.

Note: The list is indicative. The teacher can alter/add more number of experiments as per the requirement.