J. S. University, Shikohabad

# B.Tech

1st Semester& 2nd Semester

(Common to all Branches)

# *Scheme*

# *&*

# *Syllabus*

[ Effective from the session 2015-16 ]

**STUDY AND EVALUATION SCHEME FOR**

# B.Tech (Common to all branches).

SEMESTER - FIRST

| S.No. | Subject Code | Name of Subject | Periods Per Week | | | | Evaluation Scheme | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | L | T | P | D | Sessional | End Exam | Total | Duration |
| **THEORY SUBJECT** | | | | | | | | | | |
| 1 | BTAS-11 | Professional Communication | 4 | 1 | - | - | 50 | 100 | 150 | 3 |
| 2 | BTAS-12 | Engg. Mathematics-I | 4 | 1 | - | - | 50 | 100 | 150 | 3 |
| 3 | BTAS-13 | Engg. Physics-I | 4 | 1 | - | - | 25 | 50 | 75 | 2 |
| 4 | BTME-11 | Engg. Mechanics | 4 | 1 | - | - | 50 | 100 | 150 | 3 |
| 5 | BTCS-11 | Computer System and Programming in C | 4 | 1 | - | - | 50 | 100 | 150 | 3 |
| 6 | BTAS-14 | Environment &Ecology | 4 | 1 | - | - | 25 | 50 | 75 | 2 |
| **PRACTICA/DRAWING SUBJECTS** | | | | | | | | | | |
| 7 | BTME 11P | Engg.Mechanics Lab | - | - | 2 | - | 20 | 30 | 50 | 3 |
| 8 | BTCS-11P | Computer Programming Lab | - | - | 2 | - | 20 | 30 | 50 | 3 |
| 9 | BTCG-11P | ComputerAided Engg. Graphics | - | - | 3 | - | 20 | 30 | 50 | 3 |
| 10 | BTAS-11P | Professional Communication Lab | - | - | 2 | - | 20 | 30 | 50 | 3 |
| 11 | BTGD-10 | Games//Social and Cultural Activities + Discipline ( 25 + 25) | | | | | | | 50 | |
| | | | | | | | | Grand Total | 1000 | |

NOTE:- (1) Each period will be 50 minutes duration.

(2) Each session will be of 16 weeks.

(3) Effective teaching will be at least 14 weeks.

(4) Remaining periods will be utilised for revision etc.

**STUDY AND EVALUATION SCHEME FOR**

# B.Tech (Common to all branches).

SEMESTER - SECOND

| S.No. | Subject Code | Name of Subject | Periods Per Week | | | | Evaluation Scheme | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | L | T | P | D | Sessional | End Exam | Total | Duration |
| **THEORY SUBJECT** | | | | | | | | | | |
| 1 | BTEC-21 | Electronics Engg. | 4 | 1 | - | - | 50 | 100 | 150 | 3 |
| 2 | BTAS-22 | Engg. Mathematics-II | 4 | 1 | - | - | 50 | 100 | 150 | 3 |
| 3 | BTAS-23 | Engg. Physics-II | 4 | 1 | - | - | 25 | 50 | 75 | 3 |
| 4 | BTAS-25 | Engg. Chemistry | 4 | 1 | - | - | 50 | 100 | 150 | 3 |
| 5 | BTEE-21 | Basic Electrical Engg | 4 | 1 | - | - | 50 | 100 | 150 | 2 |
| 6 | BTME-22 | Basic Manufacturing Process | 4 | 1 | - | - | 25 | 50 | 75 | 2 |
| **PRACTICA/DRAWING SUBJECTS** | | | | | | | | | | |
| 7 | BTAS 25P | Engg. Chemistry Lab | - | - | 2 | - | 20 | 30 | 50 | 3 |
| 8 | BTEE-21P | Basic Electrical Engg. Lab | - | - | 2 | - | 20 | 30 | 50 | 3 |
| 9 | BTAS-23P | Engg. Physics Lab | - | - | 3 | - | 20 | 30 | 50 | 3 |
| 10 | BTWP-21P | Workshop Practice | - | - | 2 | - | 20 | 30 | 50 | 3 |
| 11 | BTGD-20 | Games//Social and Cultural Activities + Discipline ( 25 + 25) | | | | | | | 50 | |
| | | | | | | | | Grand Total | 1000 | |

NOTE:- (1) Each period will be 50 minutes duration.

(2) Each session will be of 16 weeks.

(3) Effective teaching will be at least 14 weeks.

(4) Remaining periods will be utilised for revision etc.

# BTAS-11 PROFESSIONAL COMMUNICATION

**Unit-1 Fundamentals of Communication**
Technical Communication: features: Distinction between General and Technical communication; Language as a tool of communication; Levels of communication: Interpersonal, Organizational, Mass communications; The flow of Communication: Downward, Upward, Lateral of Horizontal (Peer group): Importance of technical communication; Barriers to Communication.

**Unit-II Constituents of Technical Written Communication**.
Synonyms and Antonyms; Homophones; Select vocabulary ofabout 500-1000 New words; **Correct Usage**: all Parts of Speech; Modals; Concord; Articles; Infinitives;Requisites of Sentence Construction: Paragraph Development: Techniques and Methods- Inductive,Deductive, Spatial, Linear, Chronological etc; The Art of Condensation-various steps.

**Unit-III Business Communication**
Principles, Sales & Credit letters;Claim and Adjustment Letters; Job application and Resumes**.**Reports: Types; Significance; Structure, Style & Writing of Reports.Technical Proposal; Parts; Types; Writing of Proposal; Significance.Negotiation & Business Presentation skills.

**Unit-IV Presentation Strategies and Listening Skills**.
Defining Purpose; Audience & Local; Organizing Contents; Preparing Outline; Audio-visual Aids; Nuances of Delivery; Body Language; Dimensions of Speech: Syllable; Accent; Pitch; Rhythm; Intonation; Paralinguistic features of voice; Listening Skills: Active Listening, Passive Listening. methods for improving Listening Skills.

**Unit-V Value-Based Text Readings**
Following essays form the suggested text book with emphasis on Mechanics of writing.
(i) Humanistic and Scientific Approaches to Human Activity by Moody E. Prior
(ii) The Language of Literature and Science by A. Huxley
(iii) The Social Function of Literature by Ian Watt
(iv) The Mother of the Sciences by A.J.Bahm
(v) The Effect of Scientific Temper on Man by Bertrand Russell.

**Text Book**
2. Technical Communication: A Practical Approach: Madhu Rani and SeemaVerma- Acme Learning, New Delhi-2011
3. Technical Communication- Principles and Practices by Meenakshi Raman &Sangeeta Sharma, Oxford Univ. Press,2007, New Delhi.

**Reference Books**
1. Communication Skills for Engineers and Scientists, Sangeeta Sharma et.al. PHI Learning Pvt.Ltd,2011, New Delhi.
2. Business Correspondence and Report Writing by Prof.R.C.Sharma& Krishna Mohan, Tata McGraw Hill & Co.Ltd.,2001, New Delhi.
4. Developing Communication Skills by Krishna Mohan, MecraBannerji- Macmillan India Ltd. 1990, Delhi.
5. Manual of Practical Communication by L.U.B.Pandey: A.I.T.B.S. Publications India Ltd.; Krishan Nagar, 2013, Delhi.
6. English Grammar and Usage by R.P.Sinha, Oxford University Press, 2005, New Delhi.

# BTAS-12 Engineering Mathematics - I

### Unit -1:Matrix Algebra

Algebra of matrices, Inverse of matrix by elementary transformation ,Rank of a matrix reducing to normal forms and echelon form , consistency of system of linear equations & solutions, Eigen values and vectors, Cayley- Hamilton theorem ( without proof)

### Unit-2:Differential calculus-I

Differentiation : Leibnitz`s theorem ,partial differentiation, Euler`s theorem on homogeneous functions, Total differentiation, Jacobian.

### Unit-3: Differential calculus-II

Expansion of functions of one and more variables ( Maclaurin`s and Taylor`s theorem), Approximate Calculations, Maxima & Minima of several Independent Variables, Lagrange's Method of Multipliers.(simple problems)

### Unit-4: Integral calculus

Double Integral, Change of Order of Integration, Triple integral ,Surface and Volumes of Solids of Revolution, Beta Function and Gamma Function (Simple Properties).

### Unit-5: Vector calculus

Differentiation & integration of vector functions, Gradient, Divergence, Curl and Differential Operator, Line, Surface and volume Integrals, Green's Theorem Gauss's and Stoke's Theorem(without proofs ) and problems based on these.

**Text Books:**

1. E. Kreyszig :Advanced Engineering Mathematics-Volume-I,JohnWiley& Sons

2. B. V. Ramana, Higher Engineering Mathematics, Tata Mc Graw- Hill Publishing Company Ltd.

3. R.K.Jain& S.R.K. Iyenger, Advance Engineering Mathematics, Narosa Publishing House.

**Reference Books:**

1. B.S. Grewal, Higher Engineering Mathematics, Khanna Publishers.

2. Peter V. O' Neil, Advanced Engineering Mathematics, Thomas ( Cengage) Learning.

3. Thomas & Finley, Calculus, Narosa Publishing House

4. Rukmangadachari, Engineering Mathematics – I, Pearson Education.

# BTME-11 Engineering Mechanics:

**UNIT-I**

**2-D CONCURRENT FORCE SYSTEM**:
Basic concepts: Definitions, Basic assumptions, Scalar & Vector quantities, Free, Forced and fixed vectors.Force System: Force, Classification & Representation, Force as aVector, Composition of forces, Parallelogram Law, Resolution, Principle of Transmissibility of forcesMoment of a force, Vector representation, Moment for coplanar force system, , Vector representation, Resolution of a force into a force and a couple. Equilibrium of coplanar force system, Free body diagrams, Determination of reactions, Equilibrium of a body under three forces, Lami's theorem.

**UNIT-II**

**2-D NON - CONCURRENT FORCE SYSTEM**:
Varignon'stheorem Couple, Coplanar Non Concurrent force systems, Resultant of coplanar force system., Transfer of force to parallel position, distributed force system , converting force into couple and vice-versa, application, types of supports and their reaction.

**Friction:**
Introduction, Wet and Dry friction, Theory of Dry friction, Angle of friction, Angle of Repose, Cone of friction, Coulomb's laws of friction.

**Plane Truss**, Difference between truss and frame, Perfect and imperfect truss, Assumptions and Analysis of Plane Truss , Method of joints, Method of section, Zero force members.

**UNIT-III**

**Centroid and Moment of Inertia:**
Center of Gravity, Center of Mass and Centroid of curves, areas,volumes, Determination of centroid by integration, Centroid of composite bodies.Definition of Moment of inertia of area, Perpendicular axis theorem and Polar moment of Inertia, Parallel axis theorem, Moment of inertia of simple areas by integration, Moment of Inertia of Composite Areas.Moment of Inertia of masses, Parallel axis theorem for mass moment of inertia, Mass moment of inertia of simple bodies by integration, Mass moment of inertia of composite bodies.

**UNIT-IV**

**Kinematics of Rigid Body:**
Introduction, Absolute motion, Plane rectilinear motion of rigid body, Plane curvilinear Motion of rigid body, x-y and n-t components, Rotation of rigid bodies, Relative Motion, Plane Motion of rigid bodies, Instantaneous center of zero velocity

**Simple stress and strain**: Normal and shear stresses. One Dimensional Loading; members of varying cross section, bars in series.Tensile Test diagram for ductile and brittle materials, Elastic constants, Strain energy.Bending and torsion theory.

**UNIT-V**

**Kinetics of Rigid Body:**
Introduction, Force, Mass and Acceleration, Newton's law of motion, D'Alembert's Principles and Dynamic Equilibrium, Laws of motion applied to planar translation, rotation and plane motion.
Work and Energy, Kinetic energy, Principle of work and energy, Conservative forces, Law of conservation of energy,Linear Impulse and Momentum, Conservation of linear momentum

**References:**

**1.** "Engineering Mechanics: Statics" , J.L Meriam , Wiley

**2.** "Engineering Mechanics: Dynamics" , J.L Meriam , Wiley

**3.** “Engineering Mechanics ” , F L Singer

**4.** “Engineering Mechanics : Statics and Dynamics”, R. C. Hibbler, Pearson

**5.** “Engineering Mechanics ” , Thimoshenko& Young , 4ed, Tata McGraw Hill

**6.** “Engineering Mechanics: Statics and Dynamics”, A. Nelason, McGraw-Hill

**7.** “Engineering Mechanics : Statics and Dynamics”, Shames and Rao, Pearson

**8.** “Engineering Mechanics : Statics and Dynamics”, S. Rajasekaran and G.Sankarasubramanian, Vikas

**9.** “Engineering Mechanics”, V. Jayakumar and M. Kumar, PHI

**10.** “Engineering Mechanics”, D. P. Sharma, PHI

**11.** “Engineering Mechanics”, M. V. Sheshagiri Rao, and D. Rama Durgaiah, University Press.

**12.** “Engineering Mechanics” , K L Kumar and V. Kumar, McGraw Hill

**13.** “Engineering Mechanics” , Bhattacharya , Oxford Press

**14.** “Engineering Mechanics ” , Dr Sadhu Singh , Umesh Publication**s**

**15.** “Engineering Mechanics ” , Bhavikatti , New Age

**16.** “Strength of Materials” F. L.Singer

**17.** “Strength of Materials” Thimoshenko& Young

**18.** “Mechanics of Solids”, R. C. Hibbler, Pearson

**19.** “Mechanics of Solids”, A. Mubeen, Pearson

# BTCS-11 Computer System and Programming in C

**UNIT 1:**
Introduction:Computer System, Generation of Computers(Low,Assembly,High,4GL),Classification of computers.Language Processors:Compiler,Interpreter and Assembler , Linker Loader, Algorithms and Flowchart .**Introduction of Operating system**: Unix, Linux, Windows,Android**Computer Network** : Introduction , Types and Applications.Input and output Device

**UNIT 2:**
**Types of Operators**: Unary , Binary ,Ternary , System Software and Application Software ,**Data Type:**Character types, Integer, short, long,unsigned, single and double-precision floating point **Number system** : Decimal , Binary , Octal , and Hexadecimal and their conversions.

**UNIT 3:**
Characteristics of a Good Programming Language; .Structure of a C program, TypeConversion .**Control Structure** : Switch-case , If-else,While, Do-while and For loop, Break and continue statement , Nested loops .

**UNIT 4:**
**Array**: Introduction, Single and multidimensional array-Declaration, Initialization.
Operations of Array: Insertion, deletion, searching and sorting, **Strings**: Declaration, Initialization, Input and output of strings, string handling functions.**Structures:** Purpose and usage of structures, declaring structures, assigning of structures,

**UNIT 5:**
Introduction to World Wide Web , Search engines , e-mail , Internet protocols :FTP , TELNET , TCP/IP ,SMTP , HTTP .

Text Book:

Behrouz A. Forouzan and Richard F. Gilberg :"Computer Science – A structured Programming Approach Using C " , C Language Learning , 2007

Reference Books:

K.N.King,"C Programming A modern Approach ", W.W.Norton , 2nd Edition , 2008.

Kernighan and Ritche , "The C Programming Language " , PHI , 2nd Edition , 2011.

P.Dey and M.Ghose , "Programming in C ", Oxford University Press 1st Edition, 2000

Paritoshkumar Bansal , "Computer Programming in C ",Krishna Educatioal Publisher 2012

# BTAS-13ENGINEERING PHYSICS-I

**Unit - I**

**Relativistic Mechanics 06 Hrs**.

Inertial & non-inertial frames, Michelson- Morley experiment, Einsteins postulates, Lorentztransformation equations, Length contraction & Time dilation, Addition of velocities; Variation of masswith velocity, Mass energyequivalence.

**Unit - II**

**Modern Physics**

Wave Mechanics: Wave- particle duality, de-Broglie matter waves, Phase and Group velocities,Davisson-Germer experiment, Heisenberg uncertainty principle and its applications, Wave function andits significance, Schrödinger's wave equation – particle in one dimensional potential box, Eigen valuesand Eigen function.

**Unit - III**

**Wave OpticsInterference**:

Interference of light, Interference in thin films (parallel and wedge shaped film), Newton'srings.

**Diffraction**: Single, double and N- Slit Diffraction, Diffraction grating.

**Polarization**: Phenomena of double refraction, Nicol prism, Retardation Plate.

**Unit - IV**

**Modern Optics**

**Laser**: Spontaneous and stimulated emission of radiation, population inversion, concept of 3 and 4 levelLaser, construction and working of Ruby, He-Ne lasers and laser applications.

**Fiber Optics**: Fundamental ideas about optical fiber, Propagation mechanism, Acceptance angle andcone, Numerical aperture, Single and Multi ModeFibers

**Holography**: Basic Principle of Holography, Construction and reconstruction of Image on hologram andapplications of holography.

**Reference Books:**

1. Concepts of Modern Physics - AurthurBeiser (Mc-Graw Hill)

2. Introduction to Special theory of - Robert Resnick - Wielly

3. Optical Fibre & Laser - Anuradha De. ( New Age )

4. Optics –AloyGhatak( Tata McGraw Hill Education Private Ltd. New Delhi)

5. Optics - Brijlal& Subramanian (S. Chand )

6. Applied Physics for Engineers- Neeraj Mehta (PHI Learning, New Delhi)

# BTAS-14 ENVIRONMENT AND ECOLOGY

UNIT- I:Nature of Environment and ecosystem:-
Introduction to Environmental science and Ecology: Definition and scope, Concepts of Ecosystem, Explain energy flow, food chain

UNIT-II: Biodiversity:-
Definition, description at national and global level, threats and conservation.
Natural resources- Renewable and non renewable, Biogeochemical cycles- carbon ,nitrogen, sulphur cycle.
Conventional and non conventional energy resources.

UNIT-III: Human Population and Environment:-
Population growth, population explosion and migration, transportation and industrial growth
Social issues related to Environment(related to water and energy conservation and waste management)

UNIT-IV: Environmental pollution:-
Definition, types of environmental pollution, causes and effects
Environmental protection through assessment and education: pollution control laws, global efforts in environmental protection.

**Recommended Textbook**

Dr. Suresh k. Dhameja, J Krishnawamy, R.J Ranjit, Wiley India

# BTME-11P Engineering Mechanics Lab

1. To determine the coefficient of friction of a flat surface.
2. Friction experiment on screw-jack.
3. Experiment based on analysis of truss.
4. To determine the mass moment of inertia of a rotating disc.
5. To conduct the tensile test and determine the ultimate tensile strength, percentage elongation for amild steel specimen.
6. To conduct the Impact-tests (Izod / Charpy) on Impact-testing machine to find the ImpactStrength of the specimen.
7. To determine the hardness of the given specimen using Vicker/Brinell/Rockwell hardness testingmachine.
8. Simple & compound gear-train experiment.
9. Worm & worm-wheel experiment for load lifting.
10. Belt-Pulley experiment.
11. Bending of simply-supported and cantilever beams for theoretical & experimental deflecti
12. Dynamics experiment on collision for determining coefficient of restitution

# BTCS-11PComputer Programming Lab

Term work shall consist of a record in the form of a journal consisting of at least twelve exercises/assignments on programming in C that includes flowcharts, pseudo codes and printouts of the programs and necessary documentation for the following exercises:

1. Write a C program to accept five numbers from console and then to display them back on console in ascending order.

2. Write a C program to calculate the sum of all numbers from 0 to 100 (both inclusive) that are divisible by 4.

3. Write a C program to accept the length of three sides of a triangle from console and to test and print the type of triangle – equilateral, isosceles, right angled, none of these.

4. Write a C program to accept a string from console and to display the following on console:

(a) Total number of characters in the string

(b) Total number of vowels in the string

(c) Total number of occurrence of character ‘a’ in the string.

(d) Total number of occurrence of string ‘the’ in the string.

5. Write a program in C to reverse the digits of a given integer.

6. Write a program in C to read an integer and display each of the digit of the integer in English.

7. Write a program in C to generate first 20 Fibonacci numbers

8. Write a program in C to generate prime numbers between 1 and n.

9. Write a program in C to compute the GCD of the given two integers

10. Write a program in C to compute the factorial of the given positive integer using recursive function.

11. Write a program in C to compute addition/subtraction/multiplication of two matrices. Use functions to read, display and add/subtract/multiply the matrices.

**Text Book**

1. Pradeep K. Sinha and Priti Sinha, “Computer Fundamentals: Fourth Edition”, BPB Publications, 2007.

2. Behrouz A. Forouzan, Richard F. Gilberg, “COMPUTER SCIENCE – A Structred Programming approach using C”, Indian Edition, Thomson, 3rd edition

**Reference Books**

1. Kernighan, Ritchie, “The C Programming Language”, Prentice Hall of India

2. Carlo Ghezi, Mehdi Jazayeri, “Programming Language Concepts”, John Wiley and Sons

3. E. Balagurusamy, “Programming in ANSIC C”, Tata McGraw Hill, 2002

# BTCG-11P Computer Aided Engineering Graphics

**Introduction**

Drawing Instruments and their uses, Sizes of drawing sheets and their layouts, BIS conventions, Lettering Techniques, Scales, Dimensioning lineconventions and free hand practicing.**2 - Sheets**

**Orthographic Projections**

Introduction, Definitions - Planes of projection, reference line and conventions employed, Projections ofpoints in all the four quadrants, Projections of straight lines (located in First quadrant/first angle only),True and apparent lengths, True and apparent inclinations to reference planes **1 - Sheets**

**Orthographic Projections of Plane Surfaces (First Angle Projection Only)**

Introduction, Definitions–projections of plane surfaces–triangle, square, rectangle, rhombus, pentagon,hexagon and circle, planes in different positions by change of position method only. **2 - Sheet**

**Projections of Solids (First Angle Projection Only)**

Introduction, Definitions – Projections of right regular tetrahedron, hexahedron (cube), prisms, pyramids,cylinders and cones in different positions.**2-Sheets**

**Sections And Development of Lateral Surfaces of Solids**

Introduction, Section planes, Sections, Section views, Sectional views, Apparent shapes and True shapesof Sections of right regular prisms, pyramids, cylinders and cones resting with base on HP. **1 - Sheet**

**Isometric Projection (Using Isometric Scale Only)**

Introduction, Isometric scale, Isometric projection of simple plane figures, Isometric projection oftetrahedron, hexahedron(cube), right regular prisms, pyramids, cylinders, cones, spheres, cutspheres.**1-Sheet**

**Practice on AUTO CAD**

layout of the software, standard tool bar/menus and description of most commonly used toolbars, navigational tools. Co-ordinate system and reference planes.Definitions of HP, VP, RPP & LPP.Creation of 2D/3D environment.Selection of drawing size and scale. Commands and creation of Lines,Co-ordinate points, axes, poly-lines, square, rectangle, polygons, splines, circles, ellipse, text, move,copy, off-set, mirror, rotate, trim, extend, break, chamfer, fillet, curves, constraints.**2 - Sheets**

**Text Books**

1. Engineering Drawing - N.D. Bhatt & V.M. Panchal, 48th edition, 2005-Charotar PublishingHouse, Gujarat.

2. Computer Aided Engineering Drawing - S. Trymbaka Murthy, -I.K. International PublishingHouse Pvt. Ltd., New Delhi, 3rd revised edition- 2006.

**Reference Books**

1. Engineering Graphics - K.R. Gopalakrishna, 32nd edition, 2005- Subash PublishersBangalore.

2. Fundamentals of Engineering Drawing with an Introduction to Interactive Computer Graphicsfor Design and Production-Luzadder Warren J., Duff John M., Eastern Economy Edition,2005-Prentice-Hall of India Pvt. Ltd., New Delhi.

3. Engineering Drawing – M.B. Shah, B.C.Rana, 2ndEdition,

# BTAS-11P PROFESSIONAL COMMUNICATION LAB

Interactive and Communicative Practical with emphasis on Oral Presentation/Spoken Communicationbased on International Phonetic Alphabets (I.P.A.)

**LIST OF PRACTICALS**

1. Group Discussion: Practical based on Accurate and Current Grammatical Patterns.

2. Conversational Skills for Interviews under suitable Professional Communication Lab conditions withemphasis on Kinesics.

3. Communication Skills for Seminars/Conferences/Workshops with emphasis on Paralinguistics/Kinesics.

4. Presentation Skills for Technical Paper/Project Reports/ Professional Reports based on proper Stressand Intonation Mechanics.

5. Official/Public Speaking based on suitable Rhythmic Patterns.

6. Theme- Presentation/ Key-Note Presentation based on correct argumentation methodologies.

7. Individual Speech Delivery/Conferences with skills to defend Interjections/Quizzes.

8. Argumentative Skills/Role Play Presentation with Stress and Intonation.

9. Comprehension Skills based on Reading and Listening Practicals on a model Audio-Visual Usage.

**Reference Books**

1. Bansal R.K. & Harrison: Phonetics in English, Orient Longman, New Delhi.

2. Sethi&Dhamija: A Course in Phonetics and Spoken English, Prentice Hall, New Delhi.

3. L.U.B.Pandey&R.P.Singh, A Manual of Practical Communication, A.I.T.B.S. Pub. India Ltd. Krishan Nagar, Delhi.

4. Joans Daniel, English Pronouncing Dictionary, Cambridge Univ. Press.

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# BTEC-21:ELECTRONICSENGINEERING

## UNIT-1

**SemiconductorDiode**

Classification of materials,PN Junction Diode,Depletionlayer,V-Icharacteristics,idealandpractical,dioderesistance, capacitance,DiodeEquivalentCircuits,TransitionandDiffusionCapacitance, ZenerDiodesbreakdownmechanism(Zenerandavalanche)

**DiodeApplication**

Series,ParallelandSeries,ParallelDiodeConfiguration, HalfandFullWaverectification,Clippers,Clampers, Zenerdiodeasshuntregulator,Voltage-MultiplierCircuits

**SpecialPurposetwoterminalDevices**Light-EmittingDiodes,Varactor(Varicap) Diodes,TunnelDiodes,Liquid-CrystalDisplays.

## UNIT-2

**BipolarJunctionTransistor**

TransistorConstruction,Operation,Amplificationaction.CommonBase,CommonEmitter,CommonCollectorConfiguration

**DCBiasingBJTs**

OperatingPoint,Fixed-Bias,EmitterBias,Voltage-DividerBiasConfiguration. CollectorFeedback,Emitter-FollowerConfiguration.BiasStabilization.CE,CB,CCamplifiersandanalysisofsinglestageCEamplifier

**FieldEffectTransistor**

ConstructionandCharacteristicofJFETs.TransferCharacteristic.CS,CD,CGamplifierandanalysisofCSamplifier

MOSFET(DepletionandEnhancement)Type,TransferCharacteristic,

## UNIT-3

**OperationalAmplifiers**

Introduction,DifferentialAmplifierCircuits,Op-AmpBasic,PracticalOp-AmpCircuits(InvertingAmplifier,NoninvertingAmplifier,Unit Follower,SummingAmplifier,Integrator,Differentiator). DifferentialandCommon-Mode

## UNIT-4

**DigitalVoltmeter**:Introduction,RAMPTechniques,**DigitalMultimeters**:

**Oscilloscope**:Introduction,BasicPrinciple,CRT,BlockDiagramofOscilloscope, SimpleCRO,Measurementofvoltage,currentphaseandfrequencyusingCRO

## UNIT-5

**FundamentalsofCommunicationEngineering:**

Elementsofa CommunicationSystem, Needof modulation,electromagneticspectrumandtypicalapplications, terminologiesincommunicationsystems, Basicsofsignalrepresentationandanalysis, Fundamentalsofamplitudeandanglemodulation,modulationanddemodulation techniques.

**TextBooks**


1. RobertL.Boylestad&LouisNashelsky“**ElectronicDevices and Circuit Theory**”, TenthEdition,Pearson Education,2013
2. H S Kalsi,“**ElectronicsInstrumentation**,”ThirdEdition,TMHPublication2012


**ReferenceBooks**


4. DevidA. Bell“**Electronics Devices and Circuits**”,5th Edition,OXFORD University Press 2008

5. JacobMillman/ChristosC.Halkias/SatyabrataJit“**ElectronicsDevices and Circuits**”, 3rd Edition, TMH 2008

# BTEE-21:ELECTRICALENGINEERING

**Unit-I**

**1. D C Circuit Analysis and Network Theorems:**

Circuit Concepts: Concepts of network, Active and passive elements, Voltage and current sources,Concept of linearity and linear network, Unilateral and bilateral elements, R, L and C as linear elements,Source transformationKirchhoff's laws; Loop and nodal methods of analysis; Star-delta transformationNetwork theorems: Superposition theorem, Thevenin's theorem, Norton's theorem, Maximum PowerTransfer theorem.

**Unit-II**

**2. Steady- State Analysis of Single Phase AC Circuits:**

AC fundamentals: Sinusoidal, square and triangular waveforms – Average and effective values, Form andpeak factors, Concept of phasors, phasor representation of sinusoidally varying voltage and current,Analysis of series, parallel and series-parallel RLC Circuits, Resonance in series and parallel circuits,bandwidth and quality factor; Apparent, active & reactive powers, Power factor, Causes and problems oflow power factor, Concept of power factor improvement.

**Unit-III**

**3. Three Phase AC Circuits:**

Three phase system-its necessity and advantages, Star and delta connections, Balanced supply andbalanced load, Line and phase voltage/current relations, Three-phase power and its measurement.

**4. Measuring Instruments:**

Types of instruments, Construction and working principles of PMMC and moving iron type voltmeters &ammeters, ingle phase dynamometer wattmeter, Use of shunts and multipliers.

**Unit-IV**

**5. Introduction to Earthing and Electrical Safety:**

Need of Earthing of equipment and devices, important electrical safety issues.

**6. Magnetic Circuit:**

Magnetic circuit concepts, analogy between electric & magnetic circuits, B-H curve, Hysteresis and eddycurrent losses, Mutual coupling with dot convention, Magnetic circuit calculations.

**7. Single Phase Transformer:**

Principle of operation, Construction, EMF equation, Equivalent circuit, Power losses, Efficiency, Introduction to auto transformer.

**Unit-V**

**8. Electrical Machines:**

Concept of electro mechanical energy conversionDC machines: Types, EMF equation of generator and torque equation of motor, Characteristics andapplications of DC motors (simple numerical problems)Three Phase Induction Motor: Types, Principle of operation, Slip-torque characteristics, Applications,Single Phase Induction motor: Principle of peration and introduction to methods of starting,applications.Three Phase Synchronous Machines: Principle of operation of alternator and synchronous motor and their applications.

**Text Books:**

1. "Principles of Electrical Engineering", V. Del Toro,; Prentice Hall International
2. "Basic Electrical Engineering", D P Kothari, I.J. Nagarath; Tata McGraw Hill
3. "Basic Electrical Engineering", S N Singh; Prentice Hall International
4. "Fundamentals of Electrical Engineering", B Dwivedi, ATripathi; Wiley India
5. "Basic Electrical Engineering", Kuldeep Sahay, New Age International Publishers

**Reference Books:**

1. "Electrical and Electronics Technology", Edward Hughes; Pearson
2. "Engineering Circuit Analysis", W.H. Hayt& J.E. Kimerly; Mc Graw Hill
3. "Basic Electrical Engineering", C L Wadhwa; New Age International
4. "Basic Electrical Engineering", T.K. Nagsarkar,M.S. Shukhija; Oxford University Press

# BTME-22 Basic Manufacturing Process

**Unit-I**

Materials and Civilization, their socio economic impact.Engineering Materials their classification and applications.

**Mechanical Properties of Materials:** Strength, elasticity, plasticity, stiffness, malleability, ductility, brittleness,malleability, toughness, hardness, resilience, hardness, machine ability, formability, weldability. fatigue& creep.

**Steels and Cast Irons:** Carbon steels, their classification based on percentage of carbon as low, mild,medium & high carbon steel, their properties & applications. Wrought iron.Cast iron. Alloy steels:stainless steel, tool steel.

**Alloys of Non Ferrous Metals:** Common uses of various non-ferrous metals (Copper, Zink, Tin, Aluminium etc.) & alloys and its composition such as Cu-alloys: Brass, Bronze, Alloys.

**Unit-II**

**Forming Processes:** Basic metal forming operations & uses of such as: Forging, Rolling, Wire & Tube drawing/making and Extrusion, and their uses.: Die & Punch assembly, cutting and forming, its applications.Hot-working versus cold-working

**Casting:** Pattern: Materials, types and allowances. Type and composition of Molding sands and theirdesirable properties. Mould making with the use of a core. Gating system.Casting defects & remedies.Cupola Furnace.Die-casting and its uses.

**Unit-III**

**Machining:** Basic principles of Lathe-machine and operations performed on it. Basic description ofmachines and operations of Shaper-Planer, Drilling, Milling & Grinding.

**Welding:** Introduction, classification of welding processes. Gas-welding, types of flames and theirapplications. Electric-Arc welding.Resistance welding. Soldering & Brazing processes and their uses.

**Unit-IV**

**Heat Treatment Processes**: Introduction to Heat- treatment of carbon steels: annealing, normalizing,quenching, tempering and case-hardening.

**Manufacturing Establishment**: Plant location.Plant layout–its types.Types of Production.Productionversus Productivity.

**Non-Metallic Materials:** Common types & uses of Wood, Cement-concrete, Ceramics, Rubber, Plasticsand Composite-materials.

**Misc. Processes:** Introduction to Galvanizing and Electroplating.

**Reference Books:**

1. “Processes and Materials of Manufacture”, Lindberg, PHI
2. “Manufacturing Engineering And Technology”, Kalpak Jian and Schmidt, Pearson
3. “Manufacturing Processes”, Kalpak Jian and Schmidt, Pearson
4. “Manufacturing Processes”, H. N .Gupta, R. C. Gupta, ArunMittal, New Age

# BTAS-23: ENGINEERING PHYSICS- II

**Crystal Structures and X-ray Diffraction**:

Space lattice, basis, Unit cell, Lattice parameter, Seven crystal systems and Fourteen Bravais lattices,Crystal-System Structure, Packing factor (cubic, body and face), Crystal structure of NaCl and diamond,Lattice planes and Miller Indices, Reciprocal Lattice, Diffraction of X-rays by crystal, Laue'sexperiment, Bragg's Law, Bragg's spectrometer.

**Unit - II**

**Dielectric and Magnetic Properties of Materials**:

**Dielectric Properties**: Dielectric constant and Polarization of dielectric materials, Types of Polarization(Polarizability). Equation of internal fields in liquid and solid (One- Dimensional), ClaussiusMussoti-Equation, Important applications of dielectric material,

**Magnetic Properties**: Magnetization, Origin of magnetic moment, Dia, para and ferro magnetism,Langevin's theory for diamagnetic material, Phenomena of hysteresis and its applications.

**Unit - III**

**Electromagnetic Theory** DisplacementCurrent, Equation of continuity, Maxwell's Equations (Integral and Differential Forms), Poyntingtheorem and Poynting vectors, EM - Wave equation and its propagation characteristics in free space.

**Unit - IV**

**Physics of some Technologically important Materials**

**Semiconductors**: Band Theory of Solids, density of states, Fermi-Dirac distribution, free carrierdensity(electrons and holes), conductivity of semiconductors.

**Superconductors**: Temperature dependence of resistivity in superconducting materials, Effect ofmagnetic field (Meissner effect), Temperature dependence of critical field, Type I and Type IIsuperconductors, BCS theory (Qualitative), High temperature superconductors and Applications of Superconductors.

**Nano-Materials**: Basic principle of nanoscience and technology, structure, properties and uses of Fullerene and Carbon nanotubes, Applications of nanotechnology.

**Reference books:**


1. Concept of Modern Physics - by Beiser (Tata Mc-Graw Hill)
2. Solid State Physics - by C. Kittel, 7th edition (Wiley Eastern)
3. Materials Science and Engineering - by V. Raghavan (Prentice- Hall India)
4. Solid State Physics - by S.O. Pillai, 5th edition (New Age International)
5. Introduction to Electrodynamics - by David J. Griffith (PH I)
6. Applied Physics for Engineers- Neeraj Mehta (PHI Learning, New Delhi)

# BTAS 25 : ENGINEERING CHEMISTRY

**UNIT-I**

-Molecular orbital theory and its applications in diatomic molecules.
-Band theory of solids.
-Lequid crystals. Application of liquid crystals.
-Types of unit cell,Calculation of density of unit cell.
-space lattice (only cubes),
-Bragg's equation.
-One and two dimensional imperfections in solids.
-Structureand applications of Graphite and Fullerenes.

**UNIT-II**

-Polymers, its classification and their applications.
-Chain and Step growth polymerization.
-Elastomers and synthetic fibres.
-Thermoplastic and Thermosetting resins.
-Conducting and biodegradablepolymers.
-General methods of synthesis of organometallic compound (Grignard Reagent) and theirapplications in polymerization and catalysis.

**UNIT-III**

-Elementary ideas and simple applications ofUV,Visible, IR and 1HNMR spectral Techniques.
-Types of organic reactions withspecial reference to elimination and substitution reaction.
-Stereochemistry with special reference to optical isomerism.

**UNIT-IV**

-Fuels; Classification of fuels. Analysis of Coal.Determination of Calorific values.
-Biogas andBiomass.
-Cement and its application.
-Plaster of paris.
-Lubricant.
-Corrosion; causes and prevention.

**UNIT-V**

-Hardness of water. Disadvantage of hard water.
-Techniques for water softening; Calgon, Zeolite,Lime-Soda, Ion exchange resin,
-Reverse osmosis.
-Water treatment method for boiler feed by internalprocess.
-Phase Rule and its application to one component system (water and sulphur).

**Textbook**

1. Chemistry for Engineers, by S. Vairam and Suba Ramesh; Wiley India

**Reference Books**

1. Textbook of Engineering Chemistry by Dr. Gopal Krishna Bhatt, Acme Publishers
2. Chemistry (9th ed), by Raymond Chang, Tata McGraw-Hill
3. Chemistry Concepts and Applications by Steven S. Zumdahl; Cengage Learning
4. Engineering Chemistry, Wiley India
5. Engineering Chemistry Author: AbhijitMallick, Viva Books
6. Text Book of Engineering Chemistry by Harsh Malhotra; Sonali Publications
7. Concise Inorganic Chemistry by J.D. Lee; Wiley India
8. Organic Chemistry (6 ed) by Morrison & Boyd; Pearson Education
9. Physical Chemistry by Gordon M. Barrow; Mc-Graw Hill
10. Organic Chemistry, Volume 1(6 ed)& 2 (5ed) by I. L. Finar; Pearson Education

# BTAS-22 Engineering Mathematics – II

## Unit -1:Differential Equations

Linear differential equations of higher order with constant coefficients only, Simultaneous linear differential equations, Solution of second order differential equations by changing dependent and independent variables, Method of variation of parameters, Applications to engineering problems (simple problems).

## Unit-2: Series Solution and special Function

Series solution of second order ordinary differential equations with variable coefficient (Frobenius method), Bessel and Legendre equations and their series solutions, Simple Properties of Bessel function and Legendre polynomials.

## Unit-3:Laplace Transform

Laplace transform, Laplace transforms of derivatives and integrals, Initial and final value theorems, Unit step function, Laplace transform of periodic function, Inverse Laplace transform, Convolution theorem, Application to solve simple linear and simultaneous differential equations.

## Unit-4: Fourier Series and Partial Differential Equations

Periodic functions, Fourier series of period $2\pi$, Euler's Formulae, Functions having arbitrary periods, Change of interval, Even and odd functions, Half range sine and cosine series, Solution of first order partial differential equations by Lagrange's method, Solution of second order linear partial differential equations with constant coefficients.

## Unit-5: Applications of Partial Differential Equations

Partial Classification of second order partial differential equations, Method of separation of variables for solving differential equations, Solution of one and two dimensional wave and heat conduction equations, Laplace equation in two dimension.

# BTAS 25P :ENGINEERING CHEMISTRY LAB

1. Alkalinity of water.
2. Hardness of water by complexometry.
3. Available chlorine in bleaching powder.
4. Chloride content in water.
5. Iron(II) content by Dichrometry.
6..Viscosity Measurement.
7. pH- metric Measurement.
8.(A) Preparation of Bakelite.
8.(B) Preparation of Urea-Formaldehyde Resin.
9. Estimating Fe (III) Content by calorimetric method.
10(A).Element detection in organic compounds.
10(B).Functional Group Identification inorganic compounds.

# BTEE-21P : ELECTRICAL ENGINEERING LAB

1. Verification of Kirchhoff's laws
2. Verification of (i) Superposition theorem (ii) Thevenin's Theorem (iii) Maximum Power TransferTheorem.
3. Measurement of power and power factor in a single phase ac series inductive circuit.
4. Study of phenomenon of resonance in RLC series circuit and obtain resonant frequency.
5. Measurement of power in 3-phase circuit by two wattmeter method.
6. Determination of parameters of ac single phase series RLC circuit
7. Determination of (i) Voltage ratio (ii) polarity and (iii) efficiency by load test of a single phasetransformer
8. To study speed control of dc shunt motor using (i) armature voltage control (ii) field flux control.
9. Determination of efficiency of a dc shunt motor by load test.
10. To study running and speed reversal of a three phase induction motor and record speed in bothdirections.
11. To measure energy by a single phase energy meter and determine error.
12. To study P-N diode characteristics
13. To study full wave and half wave rectifier circuits with and without capacitor and determine ripplefactors.
14. To study Operational Amplifier as Adder and Subtractor
15. To study transistor as a switch

# BTWP-21P : WORKSHOP PRACTICE

**1. Carpentry Shop:** 1. Study of tools & operations and carpentry joints. 2. Simple exercise usingjack plane. 3. To prepare half-lap corner joint, mortise &tennon joints. 4. Simple exercise onwoodworking lathe.
**2. Fitting (Bench Working) Shop:** 1. Study of tools & operations 2. Simple exercises involvingfitting work. 3. Make perfect male-female joint. 4. Simple exercises involvingdrilling/tapping/dieing.
**3. Black Smithy Shop:** 1. Study of tools & operations 2. Simple exercises based on black smithyoperations such as upsetting, drawing down, punching, bending, fullering& swaging.
**4. Welding Shop:** 1.Study of tools & operations of Gas welding & Arc welding 2. Simple butt andLap welded joints. 3. Oxy-acetylene flame cutting.
**5. Sheet-metal Shop:** 1. Study of tools & operations. 2. Making Funnel complete with 'soldering'.3. Fabrication of tool-box, tray, electric panel box etc.
**6. Machine Shop:** 1. Study of Single point cutting tool, machine tools and operations. 2. Planeturning. 3. Step turning 4. Taper turning. 5. Threading
**7. Foundry Shop:** 1. Study of tools & operations 2. Pattern making. 3. Mould making with the use of a core. 4. Casting

## BTAS-23P: PHYSICS LAB

1. To determine the wavelength of monochromatic light by Newton's ring.
2. To determine the wavelength of monochromatic light with the help of Fresnel's biprism.
3. To determine the focal length of two lenses by nodal slide and locate the position of cardinalpoints.
4. To determine the specific rotation of cane sugar solution using polarimeter.
5. To determine the wavelength of spectral lines using plane transmission grating.
6. To study the polarization of light by simple reflection using laser.
7. Measurement of Wavelength of a laser (He- Ne) light using single slit diffraction.
8. To determine the specific resistance of a given wire using Carey Foster's bridge.
9. To study the variation of magnetic field along the axis of current carrying - Circular coil and then toestimate the radius of the coil.
10. To verify Stefan's Law by electrical method.
11. To calibrate the given ammeter and voltmeter by potentiometer.
12. To study the Hall effect and determine Hall coefficient, carrier density and - mobility of a givensemiconductor using Hall effect set up.
13. To determine the energy band gap of a given semiconductor material.
14 To determine E.C.E. of copper using Tangent or Helmholtz galvanometer.
15. To draw hysteresis curve of a given sample of ferromagnetic material and from - this todetermine magnetic susceptibility and permeability of the given specimen.
16. To determine the ballistic constant of a ballistic galvanometer.
17. To determine the coefficient of viscosity of a liquid.
18. Measurement of fiber attenuation and aperture of fiber