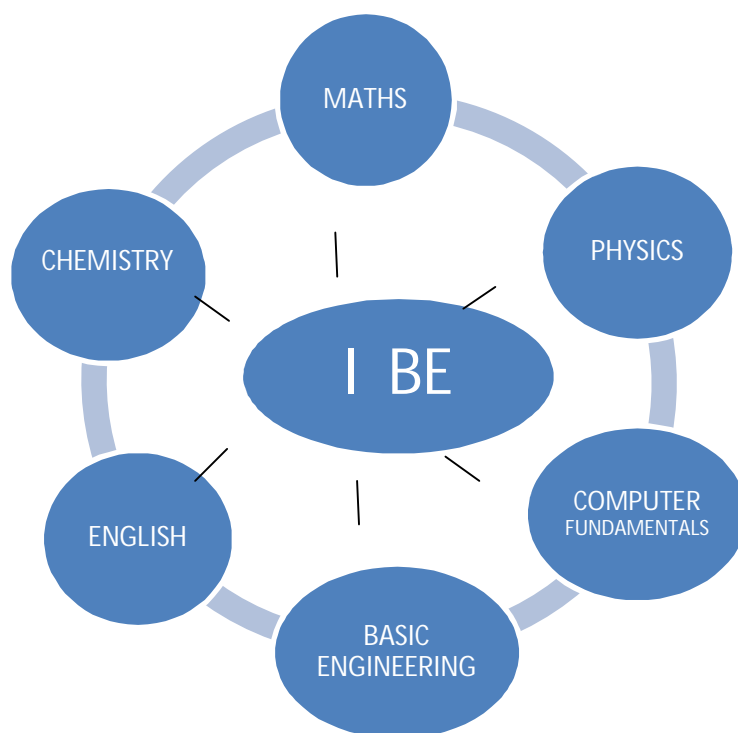




Avinashilingam
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(Estd.u/s 3 of UGC Act 1956)
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**Syllabus for I BE
I semester**

Common to all BE Degree Programmes



Faculty of Engineering

Ayya Avinashilingam Nagar
Varapalayam, Thadagam (Post)
Coimbatore – 641 108
Phone: 0422-2658716, 0422- 2658145
Email: hodshau@gmail.com

I Semester
(Common to all B.E Degree Programmes)
Scheme of Instruction & Examination

Part	Subject Code	Name of paper/component	Hours of instruction/week		Scheme of examination				
			Theory	Tutorial/Practical	Duration of exam	CIA	CE	Total	Credit
		First Semester							
I		Language							
	11 BES H01	Professional English (All branches)	3	1	3	20	80	100	3
II		Basic Science							
	11 BES M01	Engineering Mathematics-I (All branches)	5	1	3	20	80	100	4
	11 BES S01	Engineering Physics (All branches)	3	-	3	20	80	100	3
	11 BES S02	Engineering Chemistry (BMIE, CIVIL, FPPT) / Engineering Chemistry – I (CSE, PT, ECE, IT, EEE)	3	-	3	20	80	100	3
	11 BES S03	Physics and Chemistry Laboratory – I (A. Physics B. Chemistry) (All branches)	-	3	3	100	-	100	2
III		Interdisciplinary Course/ Core Course							
	11 BEB I01/ 11 BEV I01/ 11 BEL I01/ 11 BEE I01/ 11 BEP I01/ 11 BEF I01/ 11 BEO C01/ 11 BEI C01/	Problem Solving using C (All branches)	4		3	20	80	100	3
	11 BEB I02/ 11 BEV I02/ 11 BEL I02/ 11 BEE I02/ 11 BEP I02/	C Programming Laboratory (All branches)	-	3	3	50	50	100	2

	11 BEF I02/ 11 BEO C02/ 11 BEI C02/								
	11 BEB I03/ 11 BEV C01/ 11 BEL I03/ 11 BEE I03/ 11 BEP I03/ 11 BEF I03/ 11 BEO I01/ 11 BEI I01/	Engineering Graphics (All branches)	2	3	3	40	60	100	4
IV		<i>Extra -Curricular Course</i>							
	11 BXNS 01	NSS							

Total Credits: 24

Semester I

11 BES H01 Professional English (It is an integrated theory and Laboratory subject) Common to all branches

4 hrs / week

Objectives:

1. To train learners in organized academic and professional writing.
2. To develop aural competency and oral fluency of learners.
3. To help learners achieve proficiency in the effective use of language in various authentic career-related situations.

Unit I

Language through Reading

12 hrs

Skimming – scanning – predicting the content of a given passage – identifying the lexical and contextual meanings – note making (guided & unguided) cloze reading – drawing inferences – separating facts from opinions.

Unit II

Focus on Language

12 hrs

Word formation with prefixes and suffixes – synonyms and antonyms – Impersonal passive voice – Tenses – use of prepositions – ‘if clauses’ - use of words as nouns and verbs – subject – verb – agreement – Editing – British and American English.

Unit III

Language through Practice

12 hrs

Resume writing – writing instructions and recommendations – preparing checklists – classifying the data – analyzing / interpreting the data – Paragraph writing – Formal letters – writing to officials (leave letter, seeking permission for practical training, asking for Certificates, testimonials) – unseen comprehension – creative writing – Framing Agendas – Minutes of the meeting.

Unit IV

Oral Practice (Lab Sessions)

12 hrs

1.

Pronunciation Techniques:

Phonetics – Stress – Primary and Secondary stress – Neutral Accent – Rising and Falling Tone – Voice Modulation.

2. Public Speaking Skills:

Compeering – Introducing a guest to the audience – Welcome address – Proposing a vote of thanks.

Unit V (Lab Sessions)

12 hrs

1. Justifying and Summarizing Skills:

Emphasizing a point – discussing the pros and cons – focusing on reasons - Summarizing briefly and concisely

2. Designing an Advertisement:

Interpreting advertisements - Slogan/caption writing – creating one’s own advertisement for a product.

Total Hours: 60

TEXT BOOK:

Aysha Viswamohan, English for Technical Communication, Tata McGraw – Hill Publishing Co Ltd, New Delhi, 2008.

REFERENCES:

1. *Dr. S. Sumant, English for Engineers*, Tata McGraw Hill Publishing Co Ltd, New Delhi, 2005.
2. *M. Ashref Rizvi, Effective Technical Communication*, Tata McGraw Hill Publishing Co Ltd, New Delhi, 2005.
3. *Raymond V Lesikar & Marie E. Flatley, Basic Business Communication*, Tata McGraw Hill Publishing Co Ltd, New Delhi, 2005. Tenth Ed.

Semester I

11 BES M01 Engineering Mathematics – I
Common to all branches

5 hrs/ week

Objectives:

On completion of the course the students are expected to

1. Be capable of identifying algebraic eigen value problems from practical areas and obtain the eigen solutions in certain cases and to have acquired the technique of diagonalizing a matrix which would render the eigen solution procedure very simple.
2. Understand effectively the geometrical aspects of curvature, involutes and evolutes of plane curves, essential concepts for an engineer, as elegant applications of differential calculus.
3. Have learnt the method of solving differential equations of certain types, including systems of differential equations that they might encounter in their studies of other subjects in the same or higher semesters.
4. Understand and handle functions of more than one variable, from the points of view of their differentiation, expansions and extreme values.

Unit I : Matrices

14 hrs

Characteristic equation –Eigenvalues and eigenvectors of a real matrix –Properties of eigenvalue and eigenvectors – Cayley – Hamilton theorem (without proof) — Orthogonal matrices – Reduction of quadratic form to canonical form by orthogonal transformation.

Unit II : Geometrical Applications of Differential Calculus

14 hrs

Curvature – Cartesian and polar co-ordinates – Centre and radius of curvature – Circle of curvature – Involutives and evolutes – Envelopes of family of curves.

Unit III : Ordinary Differential Equations

15 hrs

Simultaneous first order linear equations with constant coefficients – Linear equations of second order with constant and variable coefficients – Homogeneous equations of Euler type – Method of variation of parameters.

Unit IV : Application Of Differential Equation

15 hrs

Solution of ODE related to electric circuits, motion of a particle in a resisting medium and simple harmonic motion.

Unit V : Functions of Several Variables

14 hrs

Functions of two variables – Partial derivatives – Total differential – Maxima & minima – Constrained maxima and minima – Lagrange's Multiplier method – Jacobians.

Total Hours: 75

TEXT BOOK :

Veerarajan, T., "Engineering Mathematics for semester I and II", updated second Edition, Tata McGraw-Hill Publishing Co.Ltd., New Delhi, 2011.

REFERENCES :

1. *Dr. M. Chandrasekaran, Dr. T. Arunachalam, Dr. Gnanambal Ilango "Engineering Mathematics – I, Volume I", First Edition – 2006, Inder Pub., Coimbatore.*
2. *Kreyszig, E., "Advanced Engineering Mathematics", Eighth Edition, John Wiley and Sons (Asia) Ltd., Singapore, 2001.*
3. *Grewal, B. S., "Higher Engineering Mathematics", Thirty Sixth Edition, Khanna Publishers, Delhi, 2001.*
4. *Kandaswamy, P., Thilagavathy, K. and Gunavathy, K., "Engineering Mathematics" Volume I, Fourth Revised Edition, S. Chand & Co., New Delhi, 2000.*

Semester I**11 BES S01 Engineering Physics****Common to all branches****Objectives:****3 hrs /week**

The aims of the course are

1. To impart fundamental knowledge in various topics of Physics and Engineering applications.
2. To enable the students to correlate the principles with applications.
3. To enhance theoretical ideas and introduce modern technological aspects.

Unit-I: Ultrasonics**9 hrs**

Introduction – magnetostriction effect – Production of ultrasonic waves: Magnetostriction generator – Inverse piezoelectric effect – Piezoelectric generator – Detection of ultrasonic waves – Properties – Cavitations – soldering and cleaning – Non Destructive Testing – Pulse echo system– Through transmission and resonance system – Medical application: Ultrasonic Doppler Blood flow meter.

Unit -II: Laser technology**9 hrs**

Principle of spontaneous emission and stimulated emission – Population inversion – Pumping mechanism – Types of lasers – He-Ne, CO₂, Nd-YAG and Semiconductor laser – Applications: welding, heat treatment, cutting, holography – Medical applications (for eye and cancer treatment) .

Unit-III: Fiber optics**9 hrs**

Principle – Modes of propagation – Crucible-crucible technique – Classification based on materials, refractive index profile – Light sources for fiber optics – Detectors – Fiber optical communication links – Applications: Temperature and displacement sensors –Endoscope.

Unit-IV: Quantum physics**9 hrs**

Introduction to Quantum theory – Dual nature of matter and radiation – de Broglie wave length – Uncertainty principle – Schrödinger's equation – Particle in a box – Electron microscope – Scanning electron microscope (SEM) – Scanning Transmission Electron Microscope (STEM).

UNIT-V: Vacuum science**9 hrs**

Importance of vacuum in industries – Schematic diagram of a vacuum system – Pumping speed and throughput – Types of pumps – Working principle and construction of Rotary pump – Diffusion pump – Measurement of vacuum using pirani and penning Gauges.

Total hours: 45**TEXT BOOK:**

1. G.Senthil Kumar, "Engineering Physics", Chennai Revised Edition, VRP Publisher, 2011.

REFERENCES:

1. *Arumugam, M., "Engineering Physics", Anuradha Agencies, Kumbakonam, (2007).*
2. *Jaya Kumar, S., "Engineering Physics", R.K.Publishers, Coimbatore, (2007).*
3. *Palanisamy, P.K. "Engineering Physics", Scitech Publications, Chennai, (2006)*

Semester I 11 BES S02 Engineering Chemistry (BMIE, CIVIL, FPPT) / Engineering Chemistry – I (CES, PT, IT, ECE, EEE)

Common to all branches

3 hrs /week

Objectives:

- 1.To develop a sound knowledge of theoretical and modern technological aspects of Chemistry.
- 2.To apply the knowledge of Chemical principles in Engineering.

Unit I : Water Technology

10 hrs

Characteristics – alkalinity – types of alkalinity and determination –hardness – types and estimation by EDTA method (problems); Domestic water treatment – disinfection methods (Chlorination, ozonation, UV treatment)- Boiler feed water – requirements – disadvantages of using hard water in boilers – internal conditioning (phosphate, calgon and carbonate conditioning methods) – external conditioning – demineralization process- desalination and reverse osmosis.

Unit II : Polymers and Composites

8 hrs

Polymers – definition – polymerization – types – addition and condensation polymerization - free radical polymerization mechanism–Plastics, classification – preparation, properties and uses of PVC, Teflon, polycarbonate, polyurethane, nylon–6, 6, PET – rubber– vulcanization of rubber, synthetic rubbers – butyl rubber, SBR, composites – definition, types polymer matrix composites – FRP only.

Unit III : Non-Conventional Energy Sources and Storage Devices

8 hrs

Nuclear energy – fission and fusion reactions and light water nuclear reactor for power generation (block diagram only) – breeder reactor – solar energy conversion – solar cells – fuel cells – hydrogen – oxygen fuel cell – batteries – alkaline batteries – lead- acid, nickel – cadmium and lithium batteries.

Unit IV : Surface Chemistry and Catalysis

9 hrs

Adsorption – types of Adsorption – Adsorption of gases on solids – Adsorption isotherm – Freundlich , Langmuir isotherms – Adsorption of solutes from solutions –applications – role of adsorption in catalytic reactions – ion exchange adsorption- basic principles in adsorption chromatography – catalysis – classification – characteristics of catalysts – auto catalysis - enzyme catalysis – Michaelis - Menton equation – acid base catalysis.

Unit V: Spectroscopy

10 hrs

Electromagnetic spectrum – absorption of radiation – electronic transition – vibrational transition- rotational transition- intensities of spectral lines – Beer- Lambert's Law – colorimetric analysis – estimation of concentration of a solution by colorimetry – flame photometry – theory, instrument (block diagram only) and application – visible & UV spectroscopy – principles, instrument (block diagram only) and simple applications – IR spectroscopy– simple applications only.

Total Hours : 45

TEXT BOOKS:

1. Jain P.C and Renuka Jain , *Engineering Chemistry ,Dhanpat Rai Pub.,Co.(P)Ltd., New Delhi.2002..*
2. *Combined Authors, Chemistry for Engineers, First edition, ISBN 978-81-265-1988-0, Wiley, India 2011.*

REFERENCES:

- 1. Bhal B.S., Tuli G.D., and Arun Bhal, *Essentials of Physical Chemistry*, S.Chand & Company Ltd., New Delhi,2004.**
- 2. S.S.Dara, *A textbook of Engineering Chemistry*, S.Chand& Company Ltd, New Delhi – 3.**
- 3. Puri B.R., Sharma L.R. and Madan S.Pathania, *Principles of Physical Chemistry*, Shoban Lal Nagin Chand & Co., Jalandhar ,2000.**
- 4. Jain P.C and Renuka Jain , *Physical Chemistry for Engineers* ,Dhanpat Rai & Sons, New Delhi.2001.**

Semester I 11 BES S03 PHYSICS AND CHEMISTRY LABORATORY -I
(A. Physics B. Chemistry)
Common to all branches

Part A – Physics

3 hrs /week

Objectives:

1. To impart experimental skills on potentially important experiments needed for Engineering.
2. To inculcate technical skill in handling of instruments and the calculation methods.

List of Experiments

1. Torsional Pendulum – determination of rigidity modulus of wire and moment of inertia of disc.
2. Air wedge – Determination of thickness of a thin wire.
3. Spectrometer – Dispersive power of a prism.
4. Determination of band gap of a thermistor.
5. Frequency of the vibrator – Melde's apparatus
6. Determination of wavelength of Laser using Grating.

Part B- Chemistry

Objectives:

1. To impart hands on experience in the use of analytical equipments
2. Should be conversant with the theoretical principles and experimental procedures for quantitative estimation.

List of Experiments

I. Water Analysis

- i. Determination of total hardness, temporary & permanent hardness of water by EDTA method.
- ii. Determination of DO content by Winkler's method.
- iii. Determination of alkalinity in a water sample.
- iv. Determination of chloride content of water sample by argentometric method.

II. Adsorption

Adsorption of Oxalic acid on activated charcoal.

III. Spectrophotometric method

- A minimum of FIVE experiments each in Physics and Chemistry shall be offered.
- Laboratory classes on alternate weeks for Physics and Chemistry.

Total Hours: 54

**11 BEB I01/11 BEV I01/11 BEL I01/11 BEE I01/11 BEP I01/11 BEF I01/
11 BEO C01/11 BEI C01**

Semester I

**PROBLEM SOLVING USING C
Common to all branches**

4 hrs / week

Objectives:

1. To understand the fundamentals of Computer and Information Technology
2. To understand what an algorithm is and to know how to express solution of a problem using an algorithm
3. To learn the concept and coding using C language.

Unit I Basics of Computer and Problem Solving Methodology

12 hrs

Digital Computer Fundamentals–Block diagram of computer–Components of a computer system–Applications of Computers–Hardware and Software definitions–Categories of Software–Booting–Installing and uninstalling Software–Software piracy–Software terminologies–Information Technology Basics–History of Internet–Internet Tools -Problem solving Techniques–Program–Program development cycle–Algorithm – Flow chart – Pseudo Code – Program control structures – Types and generation of programming languages – Development of algorithms for simple problems.

Unit II Basic Elements of C and Decision Making

12 hrs

Introduction to C – Lexical elements of C – Operators and expressions – Operator precedence and associativity of operators – Input and Output Functions – Simple computational problems - Control statements – Branching, looping, nested control structures, switch, break, continue, go to statements – Problems using control structures.

Unit III Functions, Program Structures and Arrays

12 hrs

Prototypes and Functions–Declaring, defining and accessing functions–Parameter passing methods –Recursion–Storage classes–auto, extern, static and register–Library functions–Programs using Functions - defining and processing arrays–Passing arrays to functions–Multi-dimensional arrays–Strings and basic operations on strings–Enumerated data types–Programs using simple sorting, searching and merging of arrays

**11 BEB I02/11 BEV I02/11 BEL I02/11 BEE I02/11 BEP I02/11 BEF I02/
11 BEO C02/11 BEI C02**

Semester I

C PROGRAMMING LABORATORY

3 hrs / week

Common to all branches

Objective:

1. To provide hands on training on C language.

List of Exercises

C Programs:

1. Programs using conditional operator and if statement
2. Programs using SwitchCase Statements
3. Programs using for, while and do while loops
4. Programs using Arrays
5. Programs using Functions and Recursive Functions
6. Programs using Structures
7. Programs using Pointers
8. Programs using File Operations

TEXT BOOKS:

1. Jeri R.Hanly and Elliot B. Koffman, "Problem Solving and Program Design in C", Fourth Edition, Pearson Education India, 2005.
2. Balagurusamy.E, "Programming in ANSI C", Tata McGraw Hill, Third Edition 2006.

REFERENCE:

1. Byron Gottfried, "Programming with C", II Edition, (Indian Adapted Edition), TMH publications, 2006.

**11 BEB I03/11 BEV C01/11 BEL I03/11 BEE I03/11 BEP I03/11 BEF I03/
11 BEO I01/11 BEI I01**

Semester I

ENGINEERING GRAPHICS

Common to all branches

5 hrs/week

Objectives:

1. To develop in students graphic skill for communication of concepts, ideas
2. Design of engineering products and expose them to existing national standards related to technical drawings.

Unit I: Scales, Projection of Points, Lines and Surfaces

16 hrs

Introduction to letter practice, scales used in engineering practice and representative fraction – the principles – construction of plain diagonal vernier scale, orthographic projection of points - Projection of straight lines located in the first quadrant only- determination of true length and true inclination - Projections of plane surfaces like polygonal lamina and circular lamina, located in - first quadrant only.

Unit II: Projection of Simple Solids

12 hrs

Projection of simple solids like prism, pyramid, and cylinder- Drawing views when the axis of the solid is inclined to one reference plane.

Unit III: Sectioning of Solids

15hrs

Sectioning of simple solids like prisms, pyramids, cylinder, cone and sphere. Obtaining sectional views and true shape when the axis of the solid is vertical and cutting plane inclined to one reference plane.

Unit IV: Isometric, Perspective Projection and free-hand sketching

16 hrs

Isometric projections-Isometric scale-Isometric views of simple solids - Free hand sketching techniques - sketching of orthographic views from given pictorial views of objects, including free-hand dimensioning. Sketching pictorial views from given orthographic views .perspective projections of solids.

Unit V: Auto CAD

16 hrs

Introduction to drafting software- creation of simple geometric bodies using basic primitives (line, arc, circle) and editing the drawings. Practice in drawing orthographic projection.

Total Hours: 75

TEXT BOOKS:

1. *Venugopal.K., Engineering Graphics*, New Age International (P) Limited, 2008.
2. *Natarajan K.V., Engineering drawing and graphics*, Private Publisher, Chennai, 17th Ed. 2008.
3. *N.D. Bhatt, "Engineering Drawing"* Charotar Publishing House, 46th Edition,(2003).

REFERENCES:

1. **Kumar, M. S.**, Engineering Graphics. D.D.Publications, Chennai, ninth edition, 2007.
2. **Warren, J., Luzadder and John.M.Duff.**, “*Fundamentals of Engineering Drawing*”, PrenticeHall of India Pvt., Ltd., Eleventh edition, 2007.
3. **Gopalakrishnan K.R.**, 2007. “*Engineering Drawing (Vol.I & II)*”, Subhass Publications,
4. **Bertoline and Wiebe.**, *Fundamentals of graphics Communication*, Third edition, McGrawhill, 2007
5. **Dhananjay A.Jolhe**, “*Engineering Drawing with an introduction to AutoCAD*” Tata McGraw Hill Publishing Company Limited (2008).

Avinashilingam
Institute for Home Science and Higher Education for Women
University
Faculty of Engineering

I B.E Semester II
Scheme of Instruction & Examination

Branches : BIOMEDICAL INSTRUMENTATION ENGINEERING (BMIE)
CIVIL ENGINEERING (CIVIL)
COMPUTER SCIENCE AND ENGINEERING (CSE)
ELECTRONICS AND COMMUNICATION ENGINEERING (ECE)
ELECTRICAL & ELECTRONICS ENGINEERING (EEE)
FOOD PROCESSING & PRESERVATION TECHNOLOGY (FPPT)
INFORMATION TECHNOLOGY (IT)
PRINTING TECHNOLOGY (PT)

<i>Part</i>	<i>Subject Code</i>	<i>Name of paper/component</i>	<i>Hours of instruction/ week</i>		<i>Scheme of examination</i>				
			<i>Theory</i>	<i>Tutorial / Practical</i>	<i>Duration of exam</i>	<i>CI A</i>	<i>CE</i>	<i>Total</i>	<i>Credit</i>
		<i>Courses Common to all branches</i>							
I	11BES H02	Professional English Practices Laboratory	2	2	3	50	50	100	2
II	11BES M02	Engineering Mathematics II	5	1	3	20	80	100	4
	11BES S04	Materials Science	3	-	3	20	80	100	3
	11BES S07	Applied Chemistry(BMIE)	3	-	3	20	80	100	3
	11BES S08	Chemistry for Civil Engineers (CIVIL)	3	-	3	20	80	100	3
	11BES S05	Engineering Chemistry II (CSE, ECE, EEE, IT, PT)	3	-	3	20	80	100	3
	11BES S06	Chemistry of Food Materials (FPPT)	3	-	3	20	80	100	3
	11BES S09	Physics and Chemistry Laboratory II a.Physics b.Chemistry	-	3	3	50	50	100	2
III		<i>Core Course</i>							
		BMIE							
	11BEB C01	Electron Devices & Application	4		3	20	80	100	3
	11BEB C02	Electron Devices Laboratory	-	3	3	50	50	100	2
		CIVIL	4		3	20	80	100	3

	11BEV C02	Construction Materials							
	11BEV C03	Construction Materials Lab	-	3	3	50	50	100	2
	11BEO C03	CSE Object Oriented Programming using C++	4		3	20	80	100	3
	11BEO C04	C++ Programming Laboratory	-	3	3	50	50	100	2
	11BEL C01	ECE Electric Circuit Analysis	4		3	20	80	100	3
	11BELC02	Electric Circuits Lab	-	3	3	50	50	100	2
	11BEE C01	EEE Electron Devices	4		3	20	80	100	3
	11BEE C02	Electron Devices Laboratory	-	3	3	50	50	100	2
	11BEF C01	FPPT Introduction to Food Science & Technology	4		3	20	80	100	3
	11BEF C02	Food Science Lab	-	3	3	50	50	100	2
	11BEI C03	IT Object Oriented Programming	4		3	20	80	100	3
	11BEI C04	Object oriented programming Laboratory	-	3	3	50	50	100	2
	11BEP C01	PT Printing Processes	4		3	20	80	100	3
	11BEP C02	Design Studio Lab	-	3	3	50	50	100	2
		<i>Interdisciplinary Course</i>							
	11BEB I04/ 11BEEI04/ 11BEPI04/ 11BELI04/ 11BEFI04	BMIE , ECE, EEE, FPPT, PT Basic civil and mechanical engineering	4	-	3	20	80	100	3
	11BEV I03	CIVIL Basic Electrical and Electronics Engineering	4	-	3	20	80	100	3
	11BEO I02	CSE Electronic Devices & Circuits	4	-	3	20	80	100	3
	11BEO I03	Electronic Devices & Circuits Laboratory	-	3	3	50	50	100	2
		IT	4	-	3	20	80	100	3

	11BEI I02	Electrical Circuits and Electron Devices							
	11BEB I05/ 11BEEI05/ 11BEPI05/ 11BELI05/ 11BEFI05/ 11BEI I03/ 11BEVI04 /	BMIE , ECE, EEE, FPPT, PT,IT, CIVIL Engineering Practices Laboratory a. Civil and Electrical b. Mechanical and Electronics	-	3	3	50	50	100	2
IV		Extra-Curricular course							
	11BXNS0 1	NSS							

11 BES H02 Professional English Practices Laboratory
[Integrated theory / Practical Course]
(Common to all Branches of Engineering)

4 hrs/week
(Theory:2hrs & Lab:2

Objective:
hrs)

1. To equip students of Engineering and technology with effective speaking and listening skills in English.
2. To enhance students performance in the recruitment process.
3. To develop employability value in the competitive work environment.

Exercises:

- | | | |
|------------|---|--------------|
| I | <u>Group Discussion:</u>
GD strategies – Initiating a discussion – Persuasion skills – Body language – ways of interrupting (Non – offending) – summarizing and concluding. | 9 hrs |
| II | <u>Interview Skills:</u>
Introducing oneself – Listing one’s aspirations and goals – systematically expressing one’s achievement (Academic as well as professional) | 9 hrs |
| III | <u>Presentation Skills:</u>
Business and Technical Presentation – Technical articles (for journals and conferences) - Business etiquette. | 9 hrs |
| IV | <u>Active Listening Practices:</u>
Speech Decoding – Comprehending – Types of conversation – Formal and In formal – Listening to Academic, Business and Technical Speeches. | 8 hrs |
| V | <u>Online Grammar Exercises:</u>
Editing the passage – cloze exercises - - jumbled sentences – tag question – usage of tenses – phrasal verbs – sentence patterns. | 8 hrs |
| VI | <u>Vocabulary Enrichment:</u>
Word formation – Technical Jargon – words often confused – Homophones. | 8 hrs |
| VII | <u>Review:</u>
Reading inspiring articles – inferring meanings – reading between lines and beyond lines – understanding implicit and explicit ideas. | 9 hrs |

Total hours: 60

Reference Books:

1. *Aysha Viswamohan, English for Technical Communication*, Tata McGraw – Hill Publishing Co Ltd, New Delhi, 2008.
2. *M. Ashref Rizvi, Effective Technical Communication*, Tata McGraw Hill Publishing Co Ltd, New Delhi, 2005.
3. *Dr.K.Devadoss and P.Malathi, Customize Yourself to Corporate Life*, Inder Publications, Coimbatore, 2008.

11 BES M02 Engineering Mathematics – II
(Common to all Branches of Engineering)

5 hrs/ week

Tutorial: 1 Hr

Objective:

1. To enhance knowledge in multiple integrals and its applications in Engineering.
2. To develop knowledge in Laplace transform and its applications in transform techniques.
3. To understand the concepts of complex integration and contour integration.

Unit I: Multiple Integrals

15 hrs

Double integration – Cartesian and polar coordinates – Change of order of integration – Area as a double integral – Triple integration in Cartesian coordinates – Change of variables between Cartesian and polar coordinates

Unit II: Vector Calculus

15 hrs

Gradient, divergence and curl – Line, surface and volume integrals – Green's, Gauss divergence and Stoke's theorems (without proof) – Verification of the above theorems and evaluation of integrals using them.

Unit III : Laplace Transform

15 hrs

Laplace Transform – Sufficient conditions – Transforms of elementary functions – Basic properties – Inverse transforms – Derivatives and integrals of transforms – Transforms of derivatives and integrals – Convolution theorem – Transform of periodic functions – Application to solution of linear ordinary differential equations up to second order with constant coefficients.

Unit IV: Analytic Functions

15 hrs

Function of a complex variable – Analytic function – Necessary conditions – Cauchy – Riemann equations in Cartesian coordinates – Sufficient conditions (Proof not included) – Properties of analytic function – Determination of harmonic conjugate by Milne – Thomson method – Conformal mapping – $w = z + a, az, \frac{1}{z}$

Unit V: Complex Integration

15 hrs

Statement and application of Cauchy's theorem and Cauchy's integral formula – Taylor and Laurent expansion – Singularities – Classification – Residues – Cauchy's residue theorem – Contour integration – Unit circle and semi-circular contours (excluding poles on real axis).

Total hours : 75 hrs

Text Book :

Veerarajan,T., "Engineering Mathematics (for First Year)," Second Edition , Tata McGraw-Hill Pub. Co. Ltd., New Delhi, 2002.

References:

1. *Grewal, B.S., "Higher Engineering Mathematics", Thirty Sixth Edition, Khanna Publishers, Delhi, 2001.*
2. *P.Kandaswamy,K.Thilagavathi &K.Gunavathi," Engineering Mathematics" Fifth Edition,2000 & sixth Edition ,2003,S.Chand & Company Ltd.,New Delhi.*

**11 BES S04 Materials Science
(Common to all Branches of Engineering)**

Objective:

3 hrs/week

1. To understand the properties and applications of different engineering materials.
2. To learn the concept of smart and nanomaterials.
3. To impart knowledge on advance materials and devices.

Unit - I: Semiconducting materials

9 hrs

Elemental and compound semiconductors – Intrinsic and Extrinsic semiconductors – Properties – Materials preparation: Zone refining technique – Carrier concentration in intrinsic and extrinsic semiconductors – Hall effect – Hall coefficient in extrinsic semiconductors – Experimental determination of Hall coefficient – Application of Hall effect- Semiconductor devices –Solar Cells, LDR and LCD.

Unit - II: Magnetic materials

9 hrs

Classification and Properties – Domain theory of ferromagnetism – Hysteresis – Hard and soft magnetic materials – Ferrites – Applications – Devices: Magneto optical recording – storage of magnetic data – Floppy and magnetic disc drives – Magnetic bubble memory.

Unit - III: Dielectric and superconducting materials

9 hrs

Study of various polarization-Effect of temperature and frequency on dielectric constant –Breakdown mechanisms – Applications – Ferroelectric energy converter – Types of superconductors – Properties – BCS theory (qualitative) – High T_c superconductors – Application of superconductors – SQUID, Cryotron, Magnetic levitation.

Unit - IV: Nano and smart materials

9 hrs

Dimensionality and size dependence – Fabrication methods: Top-down process (ball milling and lithographic process) and Bottom-up process (Physical vapour deposition and sol-gel method) - Shape Memory alloys (SMA) – Characteristics – Properties of NiTi alloys.

unit - V: Nano structures and devices

9 hrs

Carbon nanotubes (CNT) – Properties – Fabrication (Laser ablation, Electric arc discharge) - Applications – Organic light emitting diode (OLED), CNT field effect transistor, fuel cells– Basic Principles of Quantum well – Quantum dot Laser.

Total hours: 45

References:

1. *Jaya Kumar, S., "Materials Science", R.K.Publishers, Coimbatore,(2008).*
2. *Palanisamy, P.K., "Materials Science", 2nd Edition., Scitech Publication, Chennai,(2003).*
3. *Arumugam, M., "Material Science", 4th Edition., Anuradha Agencies, Kumbakonam, (2003).*

11 BES S05 Engineering Chemistry II
(Common for ECE, EEE, IT, PT, CSE)

3hrs/week

Objective:

1. To provide students with a background in important concepts and principles of Chemistry.
2. To use the knowledge of Chemistry in describing and solving real technological problems.

UNIT I: Electrochemistry

9 hrs

Electrochemical cells – reversible and irreversible cells – EMF – measurement of emf – electrode potential – Nernst equation (problem) – reference electrodes – Standard Hydrogen electrode - Calomel electrode – Ion selective electrode - glass electrode and measurement of pH – electrochemical series – significance – potentiometric titrations (redox - Fe²⁺ vs dichromate and precipitation – Ag⁺ vs Cl⁻) and conductometric titration (acid-base – HCl vs NaOH).

UNIT II: Corrosion and Its Control

9 hrs

Chemical corrosion-Pilling Bedworth rule-electrochemical corrosion-principle-different types-galvanic corrosion-differential aeration corrosion – factors influencing corrosion-corrosion control-selection of materials and proper designing-sacrificial anode and impressed cathodic current methods-corrosion inhibitors.

UNIT III: Polymers for Electronics

9 hrs

Conducting polymers, conducting mechanisms, Applications – Organic light emitting diodes, Sensors, Circuit Boards, Rechargeable Batteries, Photoconductive polymers – applications, Thermo sensitive polymers- applications

UNIT IV: Nano Materials

9 hrs

Size dependence of properties - Electrical, optical, magnetic and mechanical Properties. Synthesis of Nanomaterials, Traditional Chemical Routes colloid nanoparticles, self – Assemble of colloid nanoparticles, electrodeposition, Electrostatic self – assembly, Langmuir – Blodgett (LB) Technique, Organic Films in Conventional Microelectronics and Optoelectronic Devices. Electrical and Electrochemical Optical Sensors, Vapour sensors, Biosensors.

UNIT V: Engineering Materials

9 hrs

Refractory – classification – acidic, basic, and neutral refractory – Properties (refractoriness, refractoriness under load, dimensional stability, porosity, thermal spalling) – manufacture of alumina, magnesite and zirconia bricks, Abrasives – natural and synthetic abrasives-quartz, corundum, emery, garnet, diamond, silicon carbide and boron carbide. Lubricants – properties – viscosity index, flash and fire points, cloud and pour points, oiliness, aniline point - solid lubricants – graphite and molybdenum sulphide- semisolid lubricants-greases.

Total hours: 45 hrs

Text Books:

1. *P.C Jain & Monika Jain, Engineering Chemistry, Dhanpat Rai Publishing Co Ltd, New Delhi. 2002*
2. *T.Ramachandran, H.Venkataraman, P.N.Magudeswaran, Chemistry for Engineers, Vijay Nicole Imprints Private Ltd, Chennai – 29, 2008.*

References:

1. **JAIN,P.C.AND RENUKA JAIN**, *"Physical chemistry for engineers"*, , Dhanpat Rai Publishing Co Ltd, New Delhi 2001.
2. **Organic and Inorganic Nanostructures**, Alexei Nabok, Artech House, Inc. 2005.
3. **SHARMA, B.K.**, *"Industrial Chemistry"*, Goel Publishing house, Meerut, 2002.
4. **S.S.Dara**, *A textbook of Engineering Chemistry*, S.Chand& Company Ltd, New Delhi -2006.

11 BES S06 Chemistry of Food Materials
(Food Processing & Preservation Technology)

3hrs/week

Objective:

1. To impart basic knowledge of Chemistry and Biochemistry in food components and their functional properties.
2. To provide an overview of the basic principle, procedures and applications for food analysis in laboratory experiments.

UNIT I: Carbohydrates and Proteins

9 hrs

CARBOHYDRATES Definition, Classification symmetry, Isomerism, Formulation of Monosaccharides -Reactions of Glycosidic OH group and Alcoholic OH group and CHO/CO groups-Applications PROTEINS-General structure-Electrochemical properties-Configuration-Chemical bonds involved in protein structure-Colour reactions for amino acids-Applications.

UNIT II: Lipids and Nucleic Acids

9 hrs

LIPIDS-Definition, Components of Lipids, Classification-Changes during food processing-Rancidity-Characterization-Acid Number, Saponification Number, Iodine Number, RM Number-Biological Functions NUCLEIC ACIDS-Definition, Components-Phosphoric acid, Sugar and Nitrogenous base-DNA-Double helical structure, RNA Types, Informosome

UNIT III: Food Additives

9 hrs

Preservatives – sweeteners - food colours - flavouring agents - emulsifying agents, stabilizing and antifoaming agents – Antioxidants - classification and basic concepts.

UNIT IV: Instrumentation for Analysis

9 hrs

Chromatography-principles and techniques of paper, gas, ion exchange and high performance chromatography-fluorimetry- spectrophotometry- pHmetry-densitometry, NMR applications.

UNIT V: Pollution Control in Food Industries

9 hrs

Industrial waste treatment methods-treatment of dairy wastes- sugar industry wastes-meat and poultry wastes-distillery and brewery wastes-starch industry wastes.

Total hours : 45

Text Book:

1. Fennema Owen.R .(2007) **Food chemistry**, Marchel Dekhar , New York .
2. Lillian Hoagland Meyer (2004) **Food Chemistry**, CBS Publishers & Distributors, New Delhi

References:

1. Clair N.Sawyer and Perry L.McCarty. (2003) **Chemistry for Environmental Engineering & Science**, McGraw Hill Book Company
2. Mahindru, S.N.(2004) **Food Additives** Tata Mc Graw Hill Publishing Company Limited, New Delhi
3. Rao ,M.N. and Datta,A.K..(2008) **Waste Water treatment** , Oxford and IBH Publishing Co. Pvt. Ltd.
4. Suzanne Nielson..(2002) **Introduction to chemical analysis of foods**, Jones and Barlett Publishers, London.

11 BES S07 Applied Chemistry
(Biomedical Instrumentation Engineering)

3 hrs /week

UNIT I: Photo Chemistry

9 hrs

Photochemical reactions – laws of photochemistry – Grotthus – Draper Law – Stark – Einstein Law – quantum efficiency – Photochemical decomposition of HI and HBr – quantum yield determination - chemical actinometer – energy transfer in Photochemical reactions – photosensitization and quenching (example – Photosynthesis in plants) – chemiluminescence – photo physical processes – fluorescence, phosphorescence – photo inhibitors – radiation chemistry – radiolysis – principles – radiation dosimetry (units, Fricke dosimeter)

UNIT II: Corrosion and its Inhibition

9 hrs

Corrosion – causes of corrosion – principles of chemical corrosion – Pilling – Bedworth rule - principles of electrochemical corrosion – factors influencing corrosion - types of corrosion – galvanic corrosion – differential aeration corrosion - stress corrosion- soil corrosion – pitting corrosion – water line corrosion – corrosion control – cathodic protection – sacrificial anode – selection of materials and proper designing - corrosion inhibitors – anodic and cathodic inhibitors – protective coatings – electroplating – electro less plating.

UNIT III: Phase Rule

9 hrs

Phase rule – introduction – phase – component – degrees of freedom - phase diagrams – applications of phase rule to one component systems and two component systems – phase transformations – basic ideas.

UNIT IV: Basic Bio Materials

9 hrs

Bulk properties, Surface properties and characterization – polymers, silicone biomaterials, medical fibres and biotextiles – smart polymers – bioresorbable and bioerodible materials – natural materials, metals and ceramics – physicochemical surface modification.

UNIT V: Biocompatibility Concepts

9 hrs

Introduction to biocompatibility – cell material interaction – types of materials – toxic, inert, bioactive – long term effects of materials within the body – cell response. chemical and biochemical degradation of polymers – degradation of metals and ceramics – calcification of biomaterials.

Total hours : 45

Text Books:

1. Jain P.C and Renuka Jain , Engineering Chemistry ,Dhanpat Rai Pub., Co.(P)Ltd., New Delhi.2002.

2. Puri B.R., Sharma C.R. and Madan S.Pathania, Principles of Physical chemistry,Shoban Lal Nagin Chand & Co.,2000.

References:

1.Jonathan Black, 'Biological Performance of Materials: Fundamentals of Biocompatibility' 4th Edn. CRC Press 2006.

2.Bahl,B.S.,Tuli,G.D. and Arun Bhal, Essentials of Physical Chemistry, S.Chan & Co.Ltd., New Delhi,2003.

3.Biomaterials Science: An indroduction to materials in Medicine , edited by Buddy D Ratner,Allan S Hoffman, Elsevier academic press, 2004.

4.John D. Enderle, Susan M. Blanchard, Joseph D. Bronzino, 'Introduction to Biomedical Engineering' 2nd Edn. Elsevier AcademicPress, 2005.

11 BES S08 Chemistry for Civil Engineers
(Civil Engineering)

3hrs/week

Objective:

1. To provide students with a background in important concepts and principles of Chemistry.
2. To use the knowledge of Chemistry in describing and solving real technological problems.

UNIT I: Corrosion and its Control

15 hrs

Chemical corrosion-Pilling-Bedworth rule-electrochemical corrosion-principle-different types-galvanic corrosion-differential aeration corrosion –factors influencing corrosion-corrosion control-selection of materials and proper designing-sacrificial anode and impressed cathodic current methods-corrosion inhibitors.

UNIT II: Pollution

15 hrs

Air pollution- sources- classification of air pollutants –gaseous pollutants- oxides of carbon,sulphur, nitrogen, hydrocarbons-photochemical smog –particulates -green house effect-ozone depletion-prevention of air pollution- Soil pollution-sources and effects- solid waste management

UNIT III: Water Pollution

15 hrs

Physical, chemical biological characteristics of water- sources of water pollution-physico chemical analysis of water-colour,turbidity,total solids, BOD,COD-waste water treatment-sewage treatment and disposal- primary, secondary, tertiary treatment

UNIT IV: Nano Materials

15 hrs

Size dependence of properties - Electrical, optical, magnetic and mechanical Properties. Synthesis of Nonmaterials, Traditional Chemical Routes colloid nanoparticles, self – Assemble of colloid nanoparticles, eletrodeposition, Electrostatic self – assembly, Langmuir – Blodgett (LB) Technique, Organic Films in Conventional Microelectronics and Optoelectronic Devices. Electrical and Electrochemical Optical Sensors, Vapour sensors, Biosensors.

UNIT V: Engineering Materials

15 hrs

Refractory – classification – acidic, basic, and neutral refractory – Properties (refractoriness, refractoriness under load, dimensional stability, porosity, thermal spalling) – manufacture of alumina, magnesite and zirconia bricks, Abrasives – natural and synthetic abrasives-quartz,corundum,emery,garnet,diamond,silicon carbide and boron carbide. Lubricants –properties – viscosity index, flash and fire points, cloud and pour points, oilyness, aniline point - solid lubricants – graphite and molybdenum sulphide- semisolid lubricants-greases.

Text Books:

Total hours : 45

1. *P.C Jain & Monika Jain,Engineering Chemistry, Dhanpat Rai Publishing Co Ltd, New Delhi, 2002.*
2. *T.Ramachandran, H.Venkataraman, P.N.Magudeswaran, Chemistry for Engineers, Vijay Nicole Imprints Private Ltd, Chennai – 29, 2008.*

References:

1. *JAIN,P.C.AND RENUKA JAIN, "Physical chemistry for engineers", Dhanpat Rai Publishing Co Ltd, New Delhi 2001.*
2. *LLOYD A.MUNRO, " Chemistry in Engineering ", Prentice Hall Inc., London, 2009.*
3. *SHARMA, B.K., "Industrial Chemistry", Goel Publishing house, Meerut,2002.*

11 BES S09 Physics and Chemistry Laboratory -II
(Common to all Branches of Engineering)

Part A - Physics

Objective:

3 hrs. /week

1. To impart experimental skills on potentially important experiments needed for engineering.
2. To inculcate technical skill in handling of instruments and the calculation methods.

List of Experiments

1. Non Uniform Bending - Determination of Young's modulus of a beam.
2. Spectrometer – Determination of wavelength of Hg source using Grating.
3. LASER – Particle size determination.
4. Ultrasonic interferometer – Determination of compressibility of a liquid.
5. Viscosity –Determination of co-efficient of Viscosity of liquid by Poiseuilles flow.
6. Potentiometer – Calibration of low range voltmeter.

Part B – Chemistry

I. pH

- i. To find out the strength of given hydrochloric acid by sodium hydroxide.

II. Conductometry

- i. Conductometric titration of mixture of acids.
- ii. Conductometric precipitation titration using $\text{BaCl}_2 - \text{Na}_2\text{SO}_4$.

III. Potentiometry

- i. Redox titration – Iron Vs. dichromate.

IV. Viscometry

- i. Determination of molecular weight of a polymer.

Total hours: 45

11 BEB C01 Electron Devices and Application
(Biomedical Instrumentation Engineering)

4 hrs/week

Objectives

- To impart knowledge on basic semiconductor and diode concepts.
- To develop competence on transistor theory and its applications.
- To provide essential concepts of power semiconductor devices.

UNIT I: Diodes

15 hrs

Review of the semiconductor theory - Semiconductor materials – The PN junction diodes. The open circuited PN junction, The biased PN junction, VI characteristics, and Temperature dependence of VI characteristics, Comparison between Ge and Si diodes, Diode large signals & small signal models, Junction diode switching times. The Schoktty barrier diodes. Applications of diodes as Rectifiers, Clipping and Clamping, Voltage multipliers.

UNIT II: Bipolar Junction Transistor

15 hrs

Theory of BJT operation, CE, CB, CC Characteristics. DC biasing of BJTs – DC load line – Operating point, Fixed bias circuit, C to B bias Emitter stabilized bias circuit, Voltage divider bias, Design of bias circuits based on Vbe and Q point.

UNIT III: Field Effect Transistors

15 hrs

Construction & Characteristics of JFET's, Construction & Characteristics of depletion & enhancement type, MOSFET, MOSFET handling, VMOS, DMOS and CMOS, Transistors. FET biasing – Fixed bias, Self-bias & Voltage divider biasing – Design of FET biasing circuits.

UNIT IV: Special Semiconductor Devices

15 hrs

UJT, Tunnel diode, LED, Photodiode, Phototransistor, Varactor diode applications of each device, Zener diode – Application as voltage regulators.

UNIT V: Power Semiconductor Devices

15 hrs

SCR – Construction, Switch on and switch off characteristics, Half wave & Full wave power control using SCR, SCS, Diac, Triac, GTO.

Total hours: 60

Text Book:

1. **Robert Boylested & Louis Nashelsky**, “Electronics Devices And Circuits Theory”, PHI, V Edition 2002.

Reference Books:

1. **Jacob Millman & Arvil Grabel**, “Microelectronics”, McGRaw Hill, Second Edition 2003.
2. **Theodore, F. Bogart.J.R.**, “Electronic Devices & Circuits”, Prentice Hall, Fourth Edition 2003.

11 BEB C02 Electron Devices Laboratory
(Biomedical Instrumentation Engineering)

3 hrs/week

Aim

To make students familiar with characteristics and parameters of various solid state electronic devices.

Objectives

1. To obtain and study the characteristics of signal devices, special devices and semiconductor power devices.
2. To obtain the performance parameters of simple electronic devices.

List of Experiments

1. PN Diode characteristics
2. Voltage regulator Characteristics of Zener Diode
3. Transistor Characteristics in CB, CC
4. Transistor Characteristics in CE and computation of hybrid parameters
5. Characteristics of FET
6. Characteristics of UJT
7. Characteristics of SCR
8. Characteristics of DIAC
9. Characteristics of TRIAC.

Total hours: 45

11 BEV C02 Construction Material
(Civil Engineering)

4 hrs/week

Objective :

1. Provides an overview of the various materials used in construction.
2. Will have a knowledge on various tests on materials.
3. Introduction to advanced building materials.

Unit I : Stones, Bricks and Building Blocks

12hrs

Classification – application of stone in buildings, manufacture of bricks –classification – qualities – test on bricks – fire bricks – building blocks types and uses joist and filter blocks – curved shell units – lightweight concrete blocks.

Unit II : Mortar – Cement – Concrete

12hrs

Classification of mortar – preparation – selection of mortar –tests for mortar ,manufacture of cement – types of cement – characteristics – aggregates – basic characteristics - types of aggregates – admixtures – properties of fresh concrete ,properties of hardened concrete – slump test – vebe test – flow test – compacting factor test – types of concrete.

Unit III : Materials for Building Services

12hrs

Timber - market forms – industrial timber – plywood veneer – thermo Cole - panels of laminates – mechanical treatment – paints – varnishes – distempers.

Unit IV : Steel

12hrs

General – manufacture of steel – uses of steel – factors affecting physical properties of steel – magnetic properties of steel – defects in steel – Market forms of steel – mechanical treatment of steel – properties of hard steel – corrosion of ferrous metals.

Non – ferrous metals – aluminum – copper – lead – steel alloys.

Unit V : Special Materials

12hrs

Glass – ceramics – sealants for joints – sheets for pitched roof coverings – fibre glass reinforced plastic – clay products – refractories – composite materials – types applications of laminar composites – fibre textiles – mats and pads for earth reinforcement

Sustainable Materials - recycling of industrial waste as building material – polymers in civil engineering .Electrical insulators – quartz, high alumina, fly ash, mineral wool, and ceramics, stainless steel.

Total hours: 60

References:

1. **Rangwala. S.C,** “*Engineering Materials*”, Charotar Publishing House, 2009.
2. **Varghese .P.C,** “*Construction Materials*” Prentice Hall of India, New Delhi, 2006.
3. **Shetty. M.S,** “*Concrete Technology Theory and Practice*”, S.Chand and Company Ltd, New Delhi, 2005.

11 BEV C03 Construction Materials Laboratory
(Civil Engineering)

3 hrs./week

Objective:

1. Opportunity to experience material capacity and behavior.
2. Material applications and detailing in structural and non-structural building components are explored.
3. Aimed at comparative knowledge of material properties and possible applications in construction .

List of Experiments:

1. To determine the fineness of cement using dry blank sieving.
2. To determine the Normal consistency, initial and final setting time of cement sample using Vicat's apparatus.
3. To determine the soundness of given sample of cement by Le-Chatelier test,.
4. To determine the water absorption of coarse aggregate.
5. To determine the fineness modulus and particle size distribution of coarse, fine, and all in aggregates.
6. To determine the percentage bulking of a fine aggregate sample.
7. To determine the consistency of freshly mixed concrete of given proportion by slump test.
8. To determine the workability of freshly mixed concrete of given proportion by compaction factor test.
9. To determine the compressive strength of a stone sample.
10. To determine the water absorption of burnt clay bricks.
11. To determine the impact value, crushing value of coarse aggregate.
12. To construct various bonds in brick.

Total hours: 45

11 BEV I03 Basic Electrical & Electronics Engineering
(Civil Engineering)

4 Hrs/ Week

UNIT I Electrical Circuits & Measurements

12 hrs

Ohm's Law – Kirchoff's Laws – Steady State Solution of DC Circuits – Introduction to AC Circuits – Waveforms and RMS Value – Power and Power factor – Single Phase and Three Phase Balanced Circuits. Operating Principles of Moving Coil and Moving Iron Instruments (Ammeters and Voltmeters), Dynamometer type Watt meters and Energy meters.

UNIT II Electrical Machines

12 hrs

Construction, Principle of Operation, Basic Equations and Applications of DC Generators, DC Motors, Single Phase Transformer, single phase induction Motor.

UNIT III Semiconductor Devices and Applications

12 hrs

Characteristics of PN Junction Diode – Zener Effect – Zener Diode and its Characteristics – Half wave and Full wave Rectifiers – Voltage Regulation. Bipolar Junction Transistor – CB, CE, CC Configurations and Characteristics – Elementary Treatment of Small Signal Amplifier.

UNIT IV Digital Electronics

12 hrs

Binary Number System – Logic Gates – Boolean Algebra – Half and Full Adders – Flip-Flops – Registers and Counters – A/D and D/A Conversion (single concepts)

UNIT V Fundamentals of Communication Engineering

12 hrs

Types of Signals: Analog and Digital Signals – Modulation and Demodulation: Principles of Amplitude and Frequency Modulations. Communication Systems: Radio, TV, Fax, Microwave, Satellite and Optical Fibre (Block Diagram Approach only).

Total hours: 60

Text Books:

1. V.N. Mittle “Basic Electrical Engineering”, Tata McGraw Hill Edition, New Delhi, 1990.
2. R.S. Sedha, “Applied Electronics”, S. Chand & Co., 2006.

References:

1. Muthusubramanian R, Salivahanan S and Muraleedharan K A, “Basic Electrical, Electronics and Computer Engineering”, Tata McGraw Hill, Second Edition, (2006).
2. Nagsarkar T K and Sukhija M S, “Basics of Electrical Engineering”, Oxford press (2005).
3. Mehta V K, “Principles of Electronics”, S.Chand & Company Ltd, (1994).
4. Mahmood Nahvi and Joseph A. Edminister, “Electric Circuits”, Schaum' Outline Series, McGraw Hill, (2002).
5. Premkumar N, “Basic Electrical Engineering”, Anuradha Publishers, (2003).

11 BEC C03 Object Oriented Programming Using C++
(Computer Science and Engineering)

4 hrs / week

Objective:

1. To understand the Object Orientation Concept.
2. To study the concepts of object-oriented programming using C++.

UNIT I: Object and Classes

12 hrs

Object oriented programming concepts – objects – classes – methods and messages – abstraction and encapsulation – inheritance – abstract classes – polymorphism. Introduction to C++ – classes – access specifiers – function and data members – default arguments – function overloading – friend functions – const and volatile functions – static members – Objects – pointers and objects – constant objects – nested classes – local classes

UNIT II : Constructors and Destructors

12hrs

Constructors – default constructor – Parameterized constructors – Constructor with dynamic allocation – copy constructor – destructors – operator overloading –overloading through friend functions – overloading the assignment operator – type conversion – explicit constructor

UNIT III: Inheritance and Polymorphism

12hrs

Inheritance – public, private, and protected derivations – multiple inheritance - virtual base class – abstract class – composite objects Runtime polymorphism – virtual functions – pure virtual functions – RTTI – type id – dynamic casting – RTTI and templates – cross casting – down casting

UNIT IV: File Handling

12 hrs

Streams and formatted I/O – I/O manipulators - file handling – random access – object serialization – namespaces - std namespace – ANSI String Objects – standard template library.

UNIT V: Templates and Exception Handling

12 hrs

Function and class templates - Exception handling – try-catch-throw paradigm –exception specification – terminate and unexpected functions – Uncaught exception.

Total hours: 60

Text Books:

1. **B. Trivedi**, “Programming with ANSI C++”, Oxford University Press, 2007.
2. **Balagurusamy.E**, “Object Oriented Programming with C++”, Tata McGraw Hill, Fourth Edition 2008.

References:

1. **Ira Pohl**, “Object Oriented Programming using C++”, Pearson Education, Second Edition Reprint 2004.
2. **S. B. Lippman, Josee Lajoie, Barbara E. Moo**, “C++ Primer”, Fourth Edition Pearson Education, 2005.
3. **B. Stroustrup**, “The C++ Programming language”, Third edition, Pearson Education, 2004.

11 BEO C04 C++ Programming Laboratory
(Computer Science and Engineering)

3 hrs / week

Objective:

To provide hands-on training on Object Oriented Programming Language

List of Exercises

Programs using Classes

1. Programs using Data Encapsulation and Data hiding
2. Programs using Function Overloading
3. Programs using Arrays as data members
4. Programs using Arrays as Objects
5. Programs using Object as Function arguments
6. Programs using Pointers as Objects
7. Programs using Constructors and Destructors
8. Programs using Friend function
9. Programs using Operator Overloading
10. Programs using Inheritance – Single, Multiple, Multilevel and Hybrid
11. Programs using Virtual functions

Total hours: 45

List of Equipments and Components for a batch of 30 Students

1. Computer – (30 Nos.) with the following Specifications
 - 2.0 GHz or Higher speed Processors
 - 256 MB or Higher RAM
 - 20GB or Higher Hard disk
 - Windows XP/Vista/7 Operating System
2. Software – TURBO C (Freeware) – To be installed in all computers.

11 BEO I02 Electronic Devices and Circuits
(Computer Science and Engineering)

4 hrs / week

Objectives:

1. To make the students understand the basic concepts of electronic devices and its applications.
2. To provide understanding of basic analog circuitry.

Unit I: Semi Conductor Devices

12 hrs

Semiconductor - PN Junction diode - BJT-FET-SCR-IV characteristics (qualitative Treatment only)

Unit II: Amplifiers

12 hrs

Transistor biasing - self biasing - DC and AC analysis of CE, CB and CC amplifiers, Power amplifiers-Efficiency. Tuned Amplifiers - Frequency Response.

Unit III: Feed Back Amplifiers and Oscillators

12hrs

Negative feed back - Types of feedback with examples for each type - Effect of feedback on characteristic of amplifiers, Positive Feedback - Oscillators - Analysis of RC Phase shift Oscillator and LC oscillators - Hartley and Colpitt's oscillator.

Unit IV: Multivibrations and Timers

12 hrs

Bistable, Monostable and Astable multivibrators using Transistors - triggering delay and frequency Calculation, 555 Timer-Internal Block-Application.

Unit V: Operational Amplifier and Application

12 hrs

Operational amplifier - Characteristics - Block diagram - application of op-amp-Current to voltage, Voltage to current converters, Arithmetic circuits-Adder, Subtractor, multiplier, differentiator and Integrator, Active Filters - Butter worth and Chebyshev.

Total hours: 60

Text book :

1. *Floyd, "Electronic Devices"*, Addison Wesley Long man Pt. Ltd. Branch, Fifth Edition - 2008.

References :

1. *Millman and Halkias, "Integrated Electronic Circuits"*, McGraw-Hill publishers, 1985.
2. *Boylestead Nashelsky , "Electronic Devices and Circuit Theory "*- Prentice Hall of India Pvt., 6th Edition.
3. *David A. Bell, "Electronic Devices and Circuits"*, Prentice Hall of India, 5th Edition, 2008.

11 BEO I03 Electronic Devices and Circuits Laboratory
(Computer Science and Engineering)

3 hrs / week

Objective :

1. To make students familiar with characteristics of various solid state electronic devices.
2. To study the behaviour of simple electronic circuits involving discrete components and ICs.

List of Experiments:

1. PN Junction Diode Characteristics
2. Zener Diode Characteristics
3. Half Wave and Full Wave Rectifier
4. Zener Regulator
5. CE Transistor Characteristics
6. UJT Characteristics
7. FET Characteristics
8. SCR Characteristics
9. Frequency Response of CE, CB, and CC Amplifier with fixed bias and self-bias
10. Applications of 555 Timer
11. Verification of Kirchoff's Laws and Network Theorem
12. Applications of Operational Amplifier
13. RC and LC Oscillators
14. Coupled Circuits

Total hours: 45

11 BEL C01 Electric Circuit Analysis
(Electronics and Communication Engineering)

4 hrs /week

Objective:

1. To provide knowledge about the active and passive components of Electric Circuits to students.
2. To provide the students an insight analysis of both D.C and A.C circuits using various theorems and also transient analysis of different networks.

Unit I: D.C Circuit Analysis

12 hrs

Introduction to basic Components of Electric Circuits: Resistor, Inductor, Capacitor –current, voltage, power, Voltage and Current Sources, Resistors in Series and Parallel , Delta-Wye Conversion, Voltage and Current Division rule, Ohm’s law , Kirchoff’s voltage and current law, Nodal Analysis and Mesh Analysis.

Unit II: Network Theorems

14 hrs

Circuit Analysis Techniques: Superposition theorem, Thevenin and Norton Equivalent Circuits, Maximum Power Transfer theorem, Reciprocity theorem.

Unit III: Sinusoidal Steady State Analysis

20 hrs

Sinusoidal Steady - State Analysis: Characteristics of Sinusoids, the Complex Forcing Function, Phasor Relationships for R, L and C, Impedance and Admittance, Phasor Diagrams, Nodal and Mesh Analysis, AC Circuit Power Analysis- Instantaneous Power, Average Power, Apparent Power and Power Factor.

Unit IV: Transients and Resonance in RLC Circuits

14 hrs

Transient analysis of Source-Free RL Circuit, Source-Free RC Circuit, Driven RL Circuits, Driven RC Circuits, Parallel Resonance, Series Resonance – Q- factor - frequency response characteristics.

Unit V: Coupled Circuits, Duality And Topology

12 hrs

Magnetically Coupled Circuits: Mutual Inductance, Linear Transformer, The Ideal Transformer, Duality, An Introduction to Network Topology: Trees and General Nodal Analysis, Links and Loop Analysis.

Total hours: 60

Text Book:

1. *William Hayt, Jack Kemmerly, Steven Durbin, “Engineering Circuit Analysis”*, Tata McGraw Hill Edition, 2007.

References:

1. *Joseph Edminister, Mehmood Nahvi, “Schaums outlines of Electric circuits”*, Tata McGraw Hill Publishing Company Ltd., Dec 2004 Edition.
2. *Arumugam, M., Premkumaran, N.,” Electric Circuit Theory”*, Khanna Publisher, 2008 Edition.

11 BEL C02 Electric Circuits Laboratory
(Electronics and Communication Engineering)

3 hrs /week

Objective:

1. To verify various theorems.
2. To analyse the transient behaviour of simple RL, RC circuit.
3. To study the frequency response of coupled circuits and Wheatstone's bridge.

List of Experiments:

1. Verification of Kirchoff's Laws.
2. Verification of Thevinin's theorem.
3. Verification of Reciprocity theorem.
4. Verification of Superposition theorem
5. Verification of Maximum power transfer theorem.
6. Frequency response of series and parallel resonance circuits.
7. Transient analysis of RL and RC circuits.
8. Frequency response of single tuned coupled circuits.
9. Study of wheatstone's bridge.

Total hours: 45

11 BEE C01 Electron Devices
(Electrical & Electronics Engineering)

4 hrs/week

Unit I: Theory of PN Junction Diodes

Energy band structure of conductors, insulators and semiconductors – Electron hole generation and recombination – Hall effect – Drift and diffusion in semiconductors – PN junction – Open circuited junction – Depletion region – Barrier potential – Diode equation – Forward and reverse characteristics – Transition and Diffusion capacitance – Piecewise linear and switching characteristics.

Unit II: Theory of Junction Transistors

Transistor action - Transistor current components – Continuity equation in the base region – Eber – Moll's equation – Static characteristics of transistors – CE, CB and CC configurations.

Unit III: Theory of FET, UJT and SCR

Junction FET operation – Static characteristics – FET structure – Enhancement and depletion MOSFET – UJT: Operation and static characteristics – SCR : Construction and static characteristics – Application of FET, UJT and SCR.

Unit IV: Transistor and FET Biasing

Transistor biasing: Location of Q point, fixed bias, collector to base and self bias – Graphical DC bias analysis – Design of DC bias circuit – FET biasing: self biasing and voltage feedback biasing.

UNIT V: Special Semiconductor Devices

Zener diode – Tunnel Diode – DIAC – TRIAC – Changed coupled devices – Photo diodes – Phototransistors – Solar cells – LED – LCD – Photo couplers – Gunn diodes Varactor diodes.

Total hours : 60

Text Book:

Allen Mottershed, “Electronic Devices and Circuits”, Prentice Hall of India, 1989.

References:

1. **Millman and Halkias, “Electronic Devices and Circuits”, McGraw Hill, 1988.**
2. **Mathur, S. P., Kulshresta, D. C. and Chandha, P. R., Electronic Devices, Applications and Integerated Circuits”, Umesh publications, 1988.**

11 BEE C02 Electron Devices Laboratory
(Electrical & Electronics Engineering)

3 hrs/week

1. Zener Diodes as a VOLTage Regulator
2. Characteristics of CE, CC, CB configurations of BJT
3. Characteristics of JFET
4. Characteristics of MOSFET
5. Characteristics of UJT
6. Characteristics of SCR
7. Characteristics of DIAC
8. Characteristics of TRIAC
9. Characteristics of LDR
10. Characteristics of LED
11. Half wave and Full wave rectifier
12. Study of CRO.

Total hours: 45

11 BEF C01 Introduction to Food Science and Technology
(Food Processing & Preservation Technology)

4 hrs/week

Objective

- 1) To enable the students understand the basics of food science and technology
- 2) To make the students appreciate the importance of nutrients and enable them to develop new product of high nutritive value

Unit I:

12 hrs

Introduction to food science-food groups-classification-composition and nutritive value of common foods. Cereals-structure, nutritive value, characteristics, principle of cereal processing. Pulses, composition and nutritive value, principle of pulse processing.

Unit II:

12 hrs

Vegetables-classification-composition and nutritive value, effects of different methods of processing. fruits-classification-composition and nutritive value,enzymatic browning,milk and milk products-composition,nutritive value,properties,types of milk products,principle of processing of milk and milk products,handling and storage.

Unit III:

12 hrs

Egg-structure,composition,nutritive value,measures of quality,storage,use of egg in diet.freshly food,nutritive value of meat,fish and poultry-method of processing,effects of colors,texture and flavor-postmodern changes and factor affecting tenderness of meat.

Unit IV:

12 hrs

Sugar-nutritive value,properties,sugar processing techniques.fats ,nuts and oilseeds classification,composition,nutritive value,changes during processing and storage,uses of nuts and oilseeds.species and condiments,types ,functions and uses.

Unit V:

12 hrs

Moist heat ,dry heat and fat as a media of cooking,merits and demerits.food fortification and enrichment-food adulteration,dection,control of common food adultrants.

Total hours: 60

Text Book:

1. **B. Srilakshmi**, 2008, **Food Science**, New age International P. Ltd, New Delhi.

References :

1. **McWilliams**, 2007, **Food Fundamentals**, John willey and sons, New York.
2. **S. N. Mahindru**, 2009, **Food Science and Technology**, Hardbound P.Ltd, New Delhi.
- 3.**Norman N. Potter**, 2009, **Food Science** , Fifth Editation, Springerlink, Newyork.

11 BEF C02 Food Science and Technology Laboratory
(Food Processing & Preservation Technology)

3 hrs/week

Objective:

To enable students understand the concept in food science and technology and apply the basic as practical.

1. Introduction of food groups
2. Determination of edible portions and food measurements.
3. Examination of starches under microscope
4. Dry and moist heating characteristics of starch
5. Experiment on germination of malting of pulse
6. Browning reaction fruits and vegetables
7. Testing pectin strength in fruit and vegetables extract
8. Experimental cookery of vegetable
9. Precipitation methods protein in milk
10. Tenderization of meat cuts
11. Effects of temperature on egg protein
12. Basic experiments in sugar cookery
13. Determination of the best frying temperature for different fats and oil

Total hours: 45

11 BEI C03 Object Oriented Programming
(Information Technology)

4 hrs/ Week

Objective:

1. To impart knowledge on fundamentals of OOPs and improve students efficiency in Systems programming.
2. To design application and Computer programs.
3. Compare the features of C++ and Java.

Unit I : Fundamentals of OOPs

15 hrs

Object–Oriented Programming concepts – Evolution – Programming Elements – Program Structure – Enumeration Types – Functions and Pointers – Function Invocation – Overloading Functions

Unit II : Pointers

14 hrs

Scope and Storage Class – Pointer Types – Arrays and Pointers – Call–byReference – Assertions – Standard template library - Aggregate Type struct – Structure Pointer Operators – Unions – Bit Fields

Unit III : Data Handling And Member Functions

15 hrs

Classes – Constructors and Destructors – Static Member – this Pointer – reference semantics, Overloading – Overloading Operators – Unary Operator Overloading – Binary Operator Overloading – Function Selection – Pointer Operators – Iterators – containers – List

Unit IV: File Handling

15 hrs

C++ STREAMS – console streams – console stream classes – formatted and unformatted console I/O operations -, manipulators , file streams – classes , file modes , file pointers and manipulation , file I/O – exception handling

Unit V: Java Programming

15 hrs

An overview of Java -, data types , variables and arrays , operators , control statements , classes , objects , methods – inheritance , templates Packages and interfaces , exception handling , multithreaded programming , strings , input / output

Total hours: 60

References :

1. **Ira Pohl, Object–Oriented Programming Using C++**, Pearson Education, 2003.
2. **Herbert Schildt, The Java ; Complete Reference** , TMH , 2001.

11 BEI C04 Object Oriented Programming Laboratory
(Information Technology)

3 hrs/ Week

Objective:

1. To expose the students with Object Oriented Programming Concepts.
2. To let the student experience Coding, Compiling and debugging a simple C++ Program.
3. To understand the programming concepts in Java.

1. Classes
2. Data Encapsulation and data hiding
3. Function overloading
4. Arrays as data members
5. Arrays as objects
6. Object as function arguments
7. Pointers as objects
8. Constructors and destructors
9. Friend function
10. Operator overloading
11. Inheritance – single , multiple , multi level and hybrid
12. Virtual functions
13. Basic java programs

Total hours : 45

11 BEI I02 Electrical Circuits and Electron Devices
(Information Technology)

4 hrs/ Week

Objective:

1. To provide knowledge about the active and passive components of Electric Circuits to students.
2. To provide the students an insight analysis of D.C circuits using various theorems.
3. To provide basic concepts of Electron devices.

Unit I: Circuit Analysis

15 hrs

Introduction to basic Components of Electric Circuits: Resistor, Inductor, Capacitor –current, voltage, power, Voltage and Current Sources, Resistors in Series and Parallel , Delta-Wye Conversion, Voltage and Current Division rule, Ohm’s law , Kirchoff’s voltage and current law, Nodal Analysis and Mesh Analysis.

Unit II: Network Theorems

15 hrs

Circuit Analysis Techniques: Superposition theorem, Thevenin and Norton Equivalent Circuits, Maximum Power Transfer theorem, Reciprocity theorem.

Unit III: Semi-Conductor Theory & PN Junction Diodes

15 hrs

Classical theory & energy band theory – charge densities in semiconductors – mobility & conductivity – drift & diffusion currents.

PN junction Diode - VI characteristics & current components – diode resistances & capacitances – effect of temperature on diode characteristics – model of a diode — clippers, clampers & Voltage multipliers.

Unit IV: Bipolar Junction Transistors

15 hrs

Current components – input & output characteristics of a transistor in CE, CB, CC configurations & regions of operation – current gain in CE, CB, CC configurations - h parameter model - different types of biasing & applications - stability analysis.

Unit V: FET & UJT

15 hrs

Construction & characteristics of JFET – parameters of JFET – MOSFET –depletion & enhancement modes – FET in CS, CD, CG Configurations – equivalent circuit of FET at low frequencies – FET model at high frequencies – FET biasing techniques-Construction, theory of operation & characteristics of UJT & PUT.

Total hours: 60

Text books:

1. **William Hayt, Jack Kemmerly, Steven Durbin, “Engineering Circuit Analysis”** Tata McGraw Hill Edition, 2007.
2. **Robert Boylestad, “Electronic Device & Circuit Theory”**, Ninth Edition, PHI, 1998.

References:

1. **Arumugam, M. ,Premkumar,N., “Electric Circuit Theory”**, Khanna Publisher, 2008 Edition.
2. **David.A.Bell, “Electronic Devices & Circuit”**, PHI, 1998.

11 BEP C01 Printing Processes
(Printing Technology)

4 hrs/ Week

UNIT I: INTRODUCTION: Printing Industry

16 hrs

Introduction - printing technology - printing industry and its structure - workflow- pre-press, press and post press – state-of-the-art -scope of printing technology - preparing for a career in printing.

UNIT II: PRE PRESS: Designing with DTP

16 hrs

Prepress workflow, electronic reproduction. System requirement, Typography-measurement, size, font, characters, typefaces. Proof correction & standards, handling text, handling Image-originals, colour, colour reproduction, scanners, file formats, DTP make-up, planning & assembly.

UNIT III: PRESS: Conventional / Impact Printing Processes

16 hrs

Introduction – types of printing processes – latest trends in printing processes.
Impact printing - Relief Printing Processes: Letterpress and Flexographic printing - Recess Printing Processes: Intaglio and Gravure printing, Planographic Printing Processes: Lithography and offset printing - Stencil Printing Process: Screen-printing. Principle – process – applications - image carriers - parts of a press - substrates and inks used.

UNIT IV: PRESS: Non Impact / Digital Printing Processes

16 hrs

Non-Impact printing – Types : Computer to film (CTF) - computer to plate & computer to print (CTP) technologies – Electrophotography – Ionography – Magnetography – Thermography Thermal transfer and Dye sublimation – Electrography – photography - “X”-graphy - Ink Jet: continuous and drop-on-demand techniques. Principle - imaging systems - printing systems - fixing and cleaning - applications.

UNIT V: POST-PRESS: Print finishing & Packaging

16 hrs

Introduction – Latest trends in post-press.
Print Finishing: finishing techniques - binding materials – guillotines – folding - gathering - securing operations. **Packaging:** Types - Function of a package - factors influencing design of a package - computer aided package design - Colour for package design.

Total hours: 60

Text Books:

1. Kipphan Helmut (2001) “Handbook of Print Media” *Springer*, Germany. (For Units I, IV, V).
2. Hugh M Speirs (1998) “Introduction to Prepress” Pira International. (For Units II).
3. Adams J.M., Faux. D.D. and Rieber L.J. (1988) “Printing Technology” *Delmar Publishers*, New York. (For Units I, III, IV, V).

References:

1. F.A.Paine, ”Fundamentals of Packaging “.Brookside Press Ltd., London,1990.
2. Aaron L.Brody, Kenneth S.Marsh ,” The Wiley Encyclopedia for Packaging Technology “Wiley Publication “1997.
- 3.David Browne ”Teach yourself PageMaker” MIS: Press Newyork,1996.
- 4.Gergory Georges “Photoshop CS Professional” Wiley Publishers Ltd.,2004.

11 BEP C02 Design Studio Laboratory
(Printing Technology)

3 hrs/ Week

1. Review of Electronic Composition, Table work, Tabular work, fonts and type styles, word-art, Column works.
2. Familiarizing and practice with the PageMaker tool-bar
3. Picture and text manipulation, Table and tabular work setting, Image Cropping and scaling
4. Designing of commercial jobs(visiting cards, page makeup of pamphlets, advertisements, folders, journals, book work)& save files compatible to Print and Web Publishing
5. Familiarizing and practice with the CorelDraw tool-bar
6. Picture editing and Designing, Create Logo and Monogram
7. Preparation of plate for printing
8. Single color printing on paper
9. Preparation of scribbling pad using thermal binding
10. Preparation of rough pad using adhesive binding
11. Prepare a package design using software
12. Prepare a model for package

Total hours: 45

11BEBI04/ 11BEEI04/ 11BEPI04/ 11BELI04/ 11BEFI04
Basic Civil & Mechanical Engineering
(Common for BMIE, ECE, EEE, FPPT, PT)

3 hrs /week

A - CIVIL ENGINEERING

UNIT I: Surveying and Civil Engineering Materials **12 hrs**

Surveying: Objects – types – classification – principles – measurements of distances – angles – leveling – determination of areas – illustrative examples.

Civil Engineering Materials: Bricks – stones – sand – cement – concrete – steel section.

UNIT II: Building Components and Structures **12 hrs**

Foundations: Types, Bearing capacity – Requirement of good foundations.

Superstructure: Brick masonry – stone masonry – beams – columns – lintels – roofing – flooring – plastering – Mechanics – Internal and external forces – stress – strain – elasticity – Types of Bridges and Dams – Basics of Interior Design and Landscaping.

B - MECHANICAL ENGINEERING

UNIT III: Power Plant Engineering **12 hrs**

Introduction, Classification of Power Plants – Working principle of steam, Gas, Diesel, Hydroelectric and Nuclear Power plants – Merits and Demerits – Pumps and turbines – working principle of Reciprocating pumps (single acting and double acting) – Centrifugal Pump.

UNIT IV : I C Engines **12 hrs**

Internal combustion engines as automobile power plant – Working principle of Petrol and Diesel Engines – Four stroke and two stroke cycles – Comparison of four stroke and two stroke engines – Boiler used in power plant.

UNIT V: Refrigeration and Air Conditioning System **12 hrs**

Terminology of Refrigeration and Air Conditioning. Principle of vapour compression and absorption system – Layout of typical domestic refrigerator – Window and Split room Air conditioner.

Total Hours : 60 hrs

References:

1. **Shanmugam G and Palanichamy M.S,** “**Basic Civil and Mechanical Engineering**”, Tata Mc Graw Hill Publishing Co., New Delhi, (1996).
2. **Ramamrutham. S,** “**Basic Civil Engineering**”, Dhanpat Rai Publishing Co. (P) Ltd. (1999).
3. **Seetharaman S.** “**Basic Civil Engineering**”, Anurdha Agencies, (2005).
4. **Venugopal K. and Prahu Raja V,** “**Basic Mechanical Engineering**”, Anuradha Publishers, Kumbakonam, (2000).
5. **Shantha Kumar S R J.,** “**Basic Mechanical Engineering**”, Hi – tech Publications, Mayiladuthurai, (2000)

11 BEB I05/11 BEV I04/11 BEL I05/11BEEI05/11 BEF I05/11 BEI I03/11 BEP I05

Engineering Practices Laboratory

(Common for BMIE, Civil, ECE, EEE, FPPT, IT, PT)

3hrs/week

Objective :

1. To cater to the needs of the practical application and to help in learning Engineering skills in Civil, Mechanical, Electrical and Electronics
2. To provide adequate knowledge in the Plumbing & Pipe fitting, Wiring, Joints type, Simple turning & Drilling and soldering simple electronics components.

(Group –A Civil & Electrical)

1. Civil Engineering Practice

Unit –I Plumbing

Study of pipeline joints, its location and functions: valves, taps, couplings, unions, reducers, elbows in household fittings.

- i) Study of pipe connections requirements for pumps and turbines.
- ii) Preparation of plumbing line sketches for water supply and sewage works.

Hands-on-exercise:

- i) Basic pipe connections – Mixed pipe material connection – Pipe connections with different joining components.
- ii) Demonstration of plumbing requirements of high-rise buildings.

Unit-II Carpentry

Carpentry: Study of Carpentry tools, Floor construction, Wall system and stair way construction

- i) **Types of joints:** Study of the joints in roofs, doors, windows and furniture.
Straight-angle jointing, Edge-to-edge jointing, End-to-end jointing.

Unit-III Trusses

Trusses: Study of trusses common industrial trusses using models. Study of joints in door panels, wooden furniture.

- i) Study about the framing members.
- ii) Study about the roof covering materials.

2. Electrical Engineering Practice

Basic household wiring using switches, fuse, indicator-lamp, etc.

Preparation of wiring diagrams

Stair case light wiring

Tube-light wiring

Study of iron-box, fan with regulator, emergency lamp.

(Group-B Mechanical & Electronics)

3. Mechanical Engineering Practice

Welding

Arc welding of butt joints, lap joints, tee joints

Gas welding practice

Basic Machining

Simple turning, and drilling operations

Machine assembly practice

Study of the following: centrifugal pump, and air-conditioners

Demonstration on

Foundry operation like mould preparation for dumbbells, step cone pulley

4. Electronic Engineering Practice

Soldering simple electronic circuits and checking continuity

Assembling electronic components on a small PCB and testing

Study of telephone, FM radio, Low-voltage power supplies

Total : 45 hrs

Examination Pattern

The Examination is to be conducted for both groups A & B, allotting 1 ½ for each group.