COURSE STRUCTURE & SYLLABUS

1ST YEAR B.TECH PROGRAMME
(COMMON TO ALL BRANCHES)

CENTURION UNIVERSITY OF TECHNOLOGY & MANAGEMENT, ODISHA
# CENTURION UNIVERSITY OF TECHNOLOGY & MANAGEMENT

## COURSE STRUCTURE & SYLLABUS FOR 1ST YEAR B.TECH. PROGRAMME

(Common to all branches)

### 1st Semester

<table>
<thead>
<tr>
<th>Code</th>
<th>Subject</th>
<th>L-T-P</th>
<th>Credit</th>
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<tr>
<td>BSMA1101</td>
<td>Mathematics-I</td>
<td>3-1-0</td>
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<tr>
<td>BSCH1202/BSHP1102</td>
<td>Engineering Physics/Engineering Chemistry</td>
<td>3-1-0</td>
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<tr>
<td>BEEL1103/BEEEL1203</td>
<td>Basic Electronics/Basic Electrical Engineering</td>
<td>3-1-0</td>
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<td>English for Communication</td>
<td>2-0-0</td>
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<tr>
<td>BECS1106</td>
<td>Programming in ‘C’</td>
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### Practical/Sessional

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<td>BEME1107/BEEEL1207</td>
<td>Engineering Drawing/Workshop Practice</td>
<td>1-0-3</td>
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<td>BSCH1208/BSHP1102</td>
<td>Physics Laboratory/Chemistry Laboratory</td>
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<td>Basic Electronics Laboratory/Basic Electrical Engineering Laboratory</td>
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### TOTAL SEMESTER CREDITS

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### TOTAL CUMULATIVE CREDITS

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Total Contact Hours.

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Theory

BSMA1101 MATHEMATICS-I(3-1-0)

MODULE-I (10 Hours)

MODULE-II (15 Hours)
Second & Higher Order Linear Differential Equations: Linear Dependence and Independence of Solutions, Wronskian, Constant Coefficient Homogeneous Equations, Cauchy-Euler Equation, Non-homogeneous Equations, Method of Variation of Parameter, Method of Inverse Operator, Legendre Equation, Applications to Electric circuits.

MODULE-III (15 Hours)

Text Books:
1) Higher Engineering Mathematics by B.V. Raman
Publisher: TMH
2) Advanced Engineering Mathematics by E. Kreyszig
Publisher: Johnwiley & Sons Inc-8th Edition

Reference Books:
1) Advanced Engineering Mathematics by P.V.O’ Neil
Publisher: Thomson
2) Mathematical Methods by Potter & Goldberg ; Publisher : PHI
BSMA1201 MATHEMATICS-II (3-1-0)

MODULE-I (15 Hours)
Laplace Transforms, Transforms of Derivatives and Integrals, Derivatives and Integrals of
Transforms, Shifting Properties, Unit Step Function, Dirac’s Delta Function, Convolution, Inverse
Transforms, Solution to Differential Equation, Integral Equation.

MODULE-II (15 Hours)
Periodic Functions, Trigonometric Series, Fourier Series, Fourier Expansion of Functions of any
Period, Even and Odd Functions, Half Range Expansions, Fourier Integrals, Fourier Cosine and
Sine Transforms.

MODULE-III (10 Hours)
Vector Differential Calculus: Vector Algebra, Inner Product, Vector Product, Vector & Scalar
Functions and Fields, Derivatives, Gradient of a Scalar Field, Directional Derivative, Divergence
of a Vector Field, Curl of a Vector Field.

Text Book:
Advanced Engineering Mathematics by E.Kreyszig
Publisher: Johnwiley & Sons Inc 8th Edition

Reference Books:
1) Advanced Engineering Mathematics by P.V.O'Neil
   Publisher: Thomson
2) Higher Engineering Mathematics by B.V.Raman
   Publisher: TMH

BSPH1102 ENGINEERING PHYSICS (3-1-0)

Module-1 (15 hours)
Unit- 1: Oscillation and Waves(Lectures 10 hrs)
The aim of this unit is to familiarize the students with basic features of different
oscillatory systems waves in general. The topics included in this unit should be treated
qualitatively

(a) Oscillatory systems: Simple harmonic oscillation, Solution of equation, Total
    energy, Examples
(b) Damped harmonic oscillation: Differential Equation, critical damped, over

damped and under damped motion, logarithmic decrement, relaxation time and

mean life time

(c) Forced vibration: Steady state solution, amplitude and phase of displacement

and velocity

(d) Resonance: Amplitude and Velocity Resonance, Energy dissipation and

absorption, Sharpness of resonance, Quality factor

(e) Coupled oscillation of two identical simple pendulum

(f) Waves as periodic variation quantity in space and time, wave equation,

longitudinal and transverse waves.

(g) Reflection and transmission of waves at boundary of two media.(Qualitative idea

only)

Unit-2: Interference (Lectures 5 hrs)

(a) Principle of superposition , Interference of light: Coherent sources, classification

of interference, analytical treatment of two source interference, Intensity

distribution, Condition for Interference of light

(b) Fresnel’s Biprism, Determination of wavelength of light.

(c) Newton’s rings: Newton’s rings by reflected light and transmitted light,

Determination of wavelength of light, refractive index of liquid

Module-II (10 hours)

Unit-3: Diffraction (Lectures 5 hrs)

Diffractions of light waves at some simple obstacles are to be covered in this unit.

(a) Huygen’s principle, Fresnel and Fraunhofer diffraction, Difference between

interference and diffraction

(b) Fraunhofer diffraction due to a single slit. Plane transmission grating- diffraction

spectra, determination of wave length of light.

Unit-4: Polarization (Lectures 5 hrs)

The unit covers elementary features of polarization of light waves.

(a) Polarization of light waves, Representation of various types of light, Polarization

by reflection, refraction and scattering.

(b) Double refraction; Nicol prism, Quarter – wave plate, half – wave plate-

construction and use.

(c) Production and analysis of circular and elliptically polarized light. Optical

rotation (Only concepts)

Module III (10 hours)

Unit – 5: Electromagnetism (Lectures 10 hrs)

Student will be familiarized with some basic used in vector calculus prior to

development of Maxwell's electromagnetic wave equations. No proof of theorems and

laws included in this unit expected- statement and interpretation should sufficient.

(a) Vector calculus: gradient of scalar field, divergence, curl of vector field(only

Physical significance), Gauss divergence theorem, Stoke's theorem, Green’s

theorem(only statements)

(b) Gauss’s law of electrostatics in free space and in a medium(Only statements),

electric displacement( D) magnetic Induction (B), Amperes cuiruitual law(Only
statements), displacement current, Faraday’s law of electromagnetic induction (Only statements).
(c) Maxwell’s electromagnetic equation in differential form and in integral form (Only statements). Electromagnetic energy density, poynting vector, poynting theorem, vector potential and scalar potential, electromagnetic wave equation for E and B, transverse nature of EM waves.

Text Books:

Reference Books:
1. Physics for Engineers-I: Dr. S. N. Jena & H. R. Pattnaik (First edition 2009)
2. Optics- A. K. Ghatak
3. Electricity & Magnetism : E.M. Purcell

BSCH1202 ENGINEERING CHEMISTRY (3-1-0)

Module I
Structure & Bonding: Photoelectric effect, Dual nature of matter, Uncertainty principle,
Schrödinger wave equation (need not be derived), interpretation of wave functions, Molecular
Orbital theory of diatomic molecules and metallic bonding. (No. of Lectures = 7)

Phase rule: Phase, Components, Degree of freedom, Gibb’s phase rule, Phase diagram of one and two
component systems : H₂O, S and Cd-Bi. (No. of Lectures = 5)

Solid State: Crystal systems, Bravais lattices, closed packed structures, ionic solids, crystal defects
including Schottky and Frenkel defects. (No. of Lectures = 4)

Module II
Reaction Kinetics & Catalysis: Rate law, Order & Molecularity, Determination of order of reaction, Kinetics
of zero, 1st and 2nd order reactions, Collision theory, theory of absolute reaction rates, Energy of activation,
Homogeneous and heterogeneous catalysis (a general idea). (No of Lectures=7)

Electrochemistry: Electrochemical cells, EMF, Measurement of EMF, Relation between EMF & free energy
change of cell reactions, Electrode potentials and measurements with reference to standard hydrogen
electrode, calomel electrode, determination of pH, dry cells, fuel cells and storage cells. (No. of
Lectures=7)

Module III
Engineering Materials: Basic Introduction of Polymers, Glasses, Ceramics, Composites,
Nanomaterials, SMART materials and their applications. (No. of Lectures=4)

Chemical Equilibrium: Law of Mass action, relation between Kp & Kc, Expression for equilibrium
constant, Le Chatelier’s principle. (No. of Lectures=3)

Thermochemistry: Hess’s law of constant heat summation and its applications, Lattice energy,
Born-Haber cycle. (No. of Lectures=3)
Text Books:


Reference Books:

1. Physical Chemistry by Bahl & Tuli.
3. Physical Chemistry - Thomas Engel, Philip Reid by Pearson Education.

BEEL1103 BASIC ELECTRONICS (3-1-0)

MODULE – I (14 hours)

Introduction to Electronics: Signals, Frequency spectrum of signals, Analog and digital signals, Amplifiers.

Semiconductor Diodes: Introduction, Physical operation of p-n junction diodes, Characteristics of p-n junction diodes, Rectifier circuits (half-wave, full-wave, bridge and peak rectifiers), Diode clipper and clamper circuits, Zener diode, Tunnel diode, Photodiode, LED.

Bipolar Junction Transistors (BJTs): Simplified structure and physical operation of n-p-n and p-n-p transistors in the active region, Current-voltage characteristics of BJT, BJT as an amplifier and as a switch.


MODULE – II (12 hours)


Electronic Instruments: Basic principle of Oscilloscope, Function of the sweep generator, Block diagrams of oscilloscope, Simple CRO, Measurement of frequency and phase by Lissajous method, Application of oscilloscope for measurement of voltage, period and frequency, Block diagram of standard signal generator, AF sine and square wave generator, and Function generator.

MODULE – III (12 hours)

Digital Electronic Principles: Introduction, Binary digits, Logic levels and Digital waveforms, Introduction to basic logic operation, Number system, Decimal numbers, Binary numbers, Decimal-to-Binary conversion, Simple binary arithmetic, 1’s & 2’s complement
Logic Gates and Boolean Algebra: The inverter, The AND, OR, NAND NOR, Exclusive-OR and Exclusive-NOR gate, Boolean operations and expressions, Laws and Rules of Boolean algebra, DeMorgan's theorem, Boolean analysis of logic circuits, Standard forms of Boolean expressions (SOP, POS), Boolean expression and truth table.

Combinational Logic and Their Functions: Basic combinational logic circuits, Implementation of combinational logic, The universal properties of NAND and NOR gates, Basic adders, Subtractors, Multiplexers and Demultiplexers. Elementary treatment of Latches, Basic concepts of Memory (RAMs)

Text Books:

Reference Books:

**BEEL1203 BASIC ELECTRICAL ENGINEERING (3-1-0)**

**MODULE-1 (12 Lectures)**

Introduction to Electrical Engineering: Essence of electricity, Electric field; electric current, potential and potential difference, emf, electric power, ohm’s law, basic circuit components, Ideal and Practical Sources, Source Conversion, Induced EMF, Energy Stored in Inductor & Capacitor

DC Networks: Laws and Theorems applicable to DC networks (KCL & KVL, Node voltage & Mesh current analysis, Delta-Star & Star-Delta conversion, Superposition principle, Thevenin & Norton theorem), Transients in R-L and R-C circuits with DC excitation. Simple problems.

Magnetic Circuits: Introduction to Electromagnetism, B-H curve, Permeability, Reluctance, Solution of simple magnetic circuits, Hysteresis and Eddy current loss.

D.C. Machines: Construction, Classification and Principle of operation of DC machines, EMF equation of DC generator, Speed Equation of DC Motor.

**MODULE-2 (12 Lectures)**

Three-Phase AC Circuits: Comparison between single-phase and three-phase systems, Three-phase EMF Generation, Line and Phase quantities in star and delta networks, Power and its measurement in three-phase balanced circuits.

Single-Phase Transformers: Construction and principle of operation, EMF Equation, Transformation ratio, Practical and Ideal transformers, Transformer losses, Brief idea on Transformer Phasor diagram and transformer rating.

MODULE-3 (12 Lectures)

Induction Motors: Introduction to Three-phase and Single-phase Induction Motors, Concept of Slip, Slip-Torque characteristics (no derivations).


Power Systems: Brief idea about various generating plants (Thermal, Hydel, and Nuclear), Transmission, Distribution and Utilization of Electric Energy.

Text Books:


Reference Books:


4. Rajendra Prasad, "Fundamentals of Electrical Engineering", Prentice-Hall of India,

BEME1104 THERMODYNAMICS(3-1-0)

Module – I (15 Hours)

1. Basic concepts and definition: Scope of Thermodynamics, Macroscopic and Microscopic approaches; Definition of Fixed mass (closed systems) and Control volume(open system), Properties (extensive and Intensive), State and its representation on a property diagram, Process and its representation, Cyclic process (or cycle) and its representation, Characteristics of properties (point and path function);Reversible and Irreversible processes; Thermal, mechanical and Chemical equilibrium, Thermodynamic equilibrium and quasi-static processes, Zeroth Law of Thermodynamics and temperature, Measurement of temperature and calibration of thermometers, the ideal gas temperature scale, Measurement of pressure, Bourdon pressure gage and manometers, gage, vacuum and absolute pressure.
2. Ideal gases and their P-V-T relations, Gas mixtures.
3. Properties of pure substances:
   p-v, p-T, T-S, h-S diagram for steam, different types of steam, Introduction to steam tables with respect to specific volume, pressure, temperature, enthalpy and entropy

**Module-II (15 hours)**

4. Energy Transfer: Work Transfer (definition and calculation), Different modes of work, Displacement Work for various processes, Free expansion; Heat Transfer; Modes of heat transfer,
5. First Law of Thermodynamics:
   i. Formal statement (using cyclic processes), First law for processes of fixed masses (closed systems) and introduction of internal energy as a thermodynamics property, Introduction of enthalpy as a thermodynamic property; Definition of specific heats and their use in calculation of internal energy and enthalpy with emphasis on ideal gages.
   ii. Application of First Law to control volumes; Nozzle, Diffuser, Compressor, Turbine, Throttling device, Heat Exchanger. (only steady flow need be considered)

**Module-III (10 hours)**


**Text Books:**
1. Engineering Thermodynamics by P.K.Nag, Publisher: TMH
2. Thermodynamics, An engineering Approach, 3rd edition by YunusA.Cengel and Michael A.Bole
3. Basic Engineering Thermodynamics by Rayner Joel, Pearson Education

**Reference Books:**
1. Engineering Thermodynamics by Van Wylen and Sontang, John Wiley
2. Engineering Thermodynamics by M.Achuthan, Publisher: PHI
3. Applied Thermodynamics by Eastop and McConkey, Publisher: Pearson
4. Fundamental of Engineering Thermodynamics by E. Rathakrishnan, publisher. PHI
5. Engineering Thermodynamics by Russel and Adebiyi, publisher, Oxford
6. Steam Tables in SI Units by Ramalingam, Scitech.

**BEME1204 MECHANICS (3-1-0)**

**Module I (13 Hours)**

Concurrent forces on a plane – Composition and resolution of forces and equilibrium of concurrent coplanar forces, Method of projections, Methods of moment, Friction.
Parallel forces in a plane - Two parallel forces, General case of parallel forces, Center of parallel forces in a plane and center of gravity- centroids of composite plane figure and curves, Distributed parallel forces in a plane. General case of forces in a plane- composition of forces in a plane and equilibrium of forces in a plane.

**Module II (13 Hours)**


**Module III (14 Hours)**

Momentum and impulse, Work and Energy- impact


**Text Books:**


**Reference Books:**


**HUMG1105 ENGLISH FOR COMMUNICATION (2-0-0)**

**OBJECTIVE**

This is a practice-oriented, need-based, functional- communicative course designed to achieve specific linguistic and communicative competence to function efficiently in a realistic working context. The student is advised to cultivate the habit of reading newspapers, magazines, novels and books in a free, extensive manner to consolidate the skills already achieved. This implies emphasis on "doing". A more interactive process of teaching/ learning is called for to achieve the skills of effective communication.

**MODULE I: ELEMENTS OF COMMUNICATION**

(8 Hours)
1. Basics of Communication: Process of Communication and factors that influence communication – Sender, receiver, channel, code, topic, message, context, feedback, noise, filters and barriers
2. Verbal and Non-Verbal Communication: Body language
3. Purpose of Communication: Importance of Audience
4. Language Functions: Descriptive, Expressive and Social
5. Plain English: Biasfree Communication
6. Formal and Informal Style: Degrees of Formality
7. Guidelines for Effective Communication: Seven C’s of Communication

(In this module we will discuss the importance of effective communication & English language skills in a variety of contexts. Students are expected to understand the mechanism which works behind the communication process. This interactive class will provide them with the knowledge necessary to begin to identify and describe communicative events in their lives, analyze them, and make choices about meanings and responses in appropriate and effective ways.)

MODULE II: COMMUNICATIVE GRAMMAR (10 Hours)

1. Time, Tense and Aspect
2. Verbs of States and Events
3. Modals
4. Conditionals
5. Active and Passive Voice
6. Various Types of Sentences, Statements, Questions and Responses
7. Reported Speech
8. Articles and Prepositions
9. Concord
10. Phrasal Verbs

(* The teaching of grammar should be treated as a diagnostic and remedial activity and integrated with communication practice. The areas of grammar in which errors are common should receive special attention when selecting items for review.)
MODULE III: THE SOUNDS OF ENGLISH  
(4 Hours)

1. Vowels: Pure vowels, gliding vowels
2. Consonants and Consonant clusters
3. Syllables, Syllable Divisions and Stress Pattern
4. Contrastive Stress in Sentences to Highlight Different Words
5. Intonation: Falling, Rising...

(* This module should be taught in a simple, non-technical manner, avoiding technical terms as far as possible. A major portion of the module including the varieties of Spoken English is shifted to the language lab for practice.)

MODULE IV: BUILDING VOCABULARY  
(8 Hours)

1. One Word Substitution
2. Words Often Confused
3. Word Formation
4. Comprehension
5. Synonyms, Antonyms and Homonyms
6. Word Relations
7. Technical Jargon

(*Treatment: Word games/ clusters, cross words, puzzles, one word completions, rapid fire questions (quiz), word usage, finding words closest in meaning, reading materials in the library such as novels and short stories should be made compulsory. Any other innovative method may be used.)

TEXT BOOKS:


REFERENCE BOOKS:
1. Spoken English by R.K Bansal and J.B Harrison.
2. University Grammar of English by Quirck & Greenbaum
4. Word Power Made Easy, Norman Lewis

HUMG1205 BUSINESS COMMUNICATION (2-0-0)

OBJECTIVE:
The course on Business Communication focuses on the basic skills required to be an effective communicator. It aims at imparting the communication skills that are needed in the academic and professional pursuits. This is directed towards helping the students gain skills in comprehension, group discussions, presentations, interviews, active listening, technical writing and the ability to manage cross-cultural interactions. The focus is on the difficulty experienced by individual students, and the effort to explore a useful strategy for self-improvement. This is achieved through an amalgamation of lecture oriented approach of teaching with the task based skill oriented methodology of learning.

MODULE-I: UNDERSTANDING COMMUNICATION IN BUSINESS   (6 HOURS)
The module is a guide to organization communication. It is directed towards enabling students to develop the skills necessary to manage the human resources of their organization.

1. General Communication and Business Communication

3. Introduction to Cross Cultural Communication

4. Strategies to Overcome Communication Barriers

**MODULE-II: READING AND WRITING**

(15 Hours)

This unit works on the competency in reading and writing skills through such tasks/activities as reading books, articles, magazines, novels, developing outlines, key expressions, situations, slogan writing and theme building exercises, dialogue writing, interpreting pictures, technical writing.

1. Importance of Developing Reading Skills

2. Sub-Skills of Reading: Predicting Content, Skimming & Scanning, Topicalization, Topic sentence and supporting details, Inferential Reading, Guessing the Meaning of Unfamiliar Words, Note Making

3. Importance of Writing Skills.

3.1. Writing Process: Pre-writing, Drafting and Re-Writing

3.1.1. Paragraph Writing

3.1.2. Principles of Effective Writing: Unity in writing

3.1.3. Summaries and Abstracts

3.2. Business Correspondence: Writing Business Letters, E-mail Messages

Memo, Notice, Circulars, Reports, Proposals, Preparing Agenda, Drafting

Resolutions, Minutes

3.3. Career Communication: Writing Cover and Resume/ CV

3.4. Job Acceptance Letter

**MODULE-III: LISTENING AND SPEAKING**

(9 Hours)

Listening is the mother of all speaking. This unit aims to achieve competence in speaking i.e., the ability to communicate orally in clear, coherent, and persuasive language appropriate to purpose, occasion, and audience. The module focuses on developing this competency which
includes acquiring poise and developing control of the language through experience in making presentations to small groups, to large groups, and through the media.

1. **Listening Skills:** Listening Process, Hearing and Listening, Types and Barriers, Effective Listening Strategies

2. **Common forms of Oral Communication in the Business World:**
   
   2.1 Meetings: Organize Meetings, Preparing an Agenda, Chairing a Meeting, Drafting Resolutions, Writing Minutes

   2.2 Persuasive Speaking: Improving Fluency and Self Expressions, Articulation, Good Pronunciation, Voice Quality

   2.3 Making an Oral Presentation: Planning, Preparing and Delivery

   2.4 Facing an Interview: Preparation, Types of Interview, Do's and Don'ts

   2.5 Group Discussions: Debate and GD, Types of GD, GD Etiquette

(Treatment: Developing listening and speaking skills through various activities, such as role play activities, practicing short dialogues, JAM, group discussions, debates, speeches, listening to news bulletins, viewing and reviewing documentaries and short films etc.)

**Text Books:**

1. Effective Technical Communication, M. Ashraf Rizvi, TMH Publications.


**REFERENCE BOOKS:**


2. Professional Communication, Aruna Koneru, TMH
BEC1106 PROGRAMMING IN ‘C’ (2-0-0)

Module I: Introduction to programming languages and C fundamentals (10 hrs)
Evolution of programming languages, flow chart, structured programming, the compilation process, object code, source code, executable code, operating systems, interpreter, linkers, loaders etc.
Character set, Identifiers, Keywords, Data Types, Constants and Variables, Statements, Expressions, Operators, Precedence of operators, Input - output Assignments, Control structures, Decision making and Branching, Decision making & looping.

Module II: Arrays and Strings and Functions (10 hrs)
One dimensional, Multidimensional and their applications, Declarations, Manipulation & String-handling functions Monolithic vs Modular programs, User defined vs standard functions, formal vs Actual arguments, Functions category, function prototypes, parameter passing, Recursion, Storage Classes: Auto, Extern, Global, Static.

Module III: Pointers, Structures, Union and File handling (10 hrs)
Pointer variable and its importance, Pointer Arithmetic, passing parameters by reference
Declaration of structures, pointer to pointer, pointer to structure, pointer to function, unions, dynamic memory allocations, unions, file management

Text Books:

Reference:
2. B.W. Kernighan & D.M. Ritchie, "C Programming Language", PHI.

BEC1206 DATA STRUCTURE USING ‘C’ (2-0-0)

Module 1 (11 hrs)


Module 2 (8hrs)

**Module 3 (11 hrs)**


Sorting Techniques: Selection, Bubble, Insertion, Merge, Heap, Quick, Radix and address calculation. Linear searching - Binary Searching. Hash Table Methods.

**Text Books:**

1. Data Structures: Seymour Lipschutz

**Reference Books:**

1. Data Structures in C by Tanenbaum.
2. Fundamentals of Data Structure by Sahany
3. Data Structures, by Tremblay and Sorenson.

**Practical/Sessional**

**BME1107 ENGINEERING DRAWING (1-0-3)**

Sheet Lay-out & Sketching, Line Drawing, Lettering & Dimensioning;

Concept of Orthographic Projection, First-angle Projection, Projections of Points, Projection of straight line, Projection of planes,

Projection of Solids,

Sectional Views of solids, Full section,

Development of surfaces,

Introduction to computer-Aided Drafting.

**Text Books:**

1. Engineering Drawing by N.D.Bhatt & V.M.Panchal, Charotar publishing House, Anand
2. Engineering Drawing with an Introduction to AutoCAD by Dhanjay A. Johle, Tata McGraw Hill
Reference Books:

5. Engineering Drawing by Shah and Rana, Pearson Education

BEME1207 Workshop Practice (1-0-3)

Fitting Practice: Use of hand tools in fitting, preparing a male and female joint of M.S. or making a paper weight of M.S.

Welding Practice: Gas welding & Electric Arc welding Practice.

A joint such as a Lap joint, a T-joint or a Butt joint is to be prepared or to make furniture.

Machining:

(i) Stepped cylindrical Turning of a job and Thread-cutting in lathe.
(ii) Shaping
(iii) Milling

Reference:

2. Workshop Technology by WAJ Chapman, Viva Books
3. Workshop Manual by Kannaiah/ Narayana, Scitech

BSPH1108 Physics Laboratory (0-0-3)

A Student is expected to perform ten experiments from the list given below.

1. Determination of Young’s modulus by Searle’s methods.
2. Determination of Rigidity modulus by static methods.
3. Determination of surface tension by capillary rise method.
4. Determination of acceleration due to gravity by Bar / Kater’s pendulum.
5. Determination of thermal conductivity by Lee’s method.
7. Determination of grating element of a diffraction grating.
9. Plotting of characteristic curves of BJT.
10. Verification of laws of verification of strings using sonometer.
13. Study of a power source- output impedance.

**BSPH1208 CHEMISTRY LABORATORY (0-0-3)**

(Any ten experiments may be done)

1. Determination of amount of sodium hydroxide and sodium carbonate in a mixture.
2. Determination of total hardness of water by EDTA method.
3. Estimation of calcium in limestone.
4. Determination of percentage of available chlorine in a sample of bleaching powder.
5. Preparation of Phenolphthalein.
6. Preparation of Aspirin.
7. Preparation of buffer solution and determination of pH of a buffer solution.
8. Standardization of KMnO₄ using sodium oxalate.
9. Determination of Ferrous iron in Mohr’s salt by potassium permanganate.
10. Determination of partition coefficients of iodine between benzene and water.
11. Determination of rate constant of acid catalysed hydrolysis reaction.
12. Determination of concentration of a coloured substance by spectrophotometer.
15. Determination of Flash point of a given oil by Pensky_Marten’s flash point approach.

**BEEL1109 Basic Electronics Laboratory (0-0-3)**

1. Familiarity with electronics components and Devices Testing of a semiconductor Diode and a Transistor. IC pins connection (Digital Multimeter should be used should be used in testing components and devices).

2. Study and use of Oscilloscope to view waveforms and measure its amplitude and frequency.


4. Half wave and Full wave rectifiers without and with capacitor filter. Record of waveforms, Measurement of Average and rms values.

5. V - I Characteristics of anpn or pnp transistor. DC Biasing and measurement of dc voltages and currents.


7. Op amp in Inverting, non-inverting, Integrating and Differentiating configuration, Record of wave forms.

8. Truth Tables of logic gates.

9. Study and experiment using MUX - DEMUX ICs / Shift Register IC.

10. Study on CMOS logic Inverter.

**BEEL1209 Basic Electrical Engineering Laboratory (0-0-3)**

Select any 8 experiments from the list of 10 experiments

5. Study of 1-Ø induction motor or fan motor.
6. Determination of OCC (Open Circuit Characteristics) of D.C Shunt Generator.
7. Starting of 3-Ø induction motor by star-delta (Y-Δ) starter or DOL starter.
9. Starting & Speed Control of D.C Shunt motor by (i) Field flux control method & (ii) armature voltage control method.

**BEC5110 ‘C’ Programming Laboratory (0-0-3)**

**C Programming:** variables and expression assignment, simple arithmetic.
Loops, if else, case statements, break, continue, goto.
Single and multidimensional arrays.
Functions, recursions, file handling in C.
Pointers, address operators, declaring pointers and operations on pointers.
Address of an array, structures, pointers to structures, dynamic memory allocation.

**Experiment no.1**

a) Write a C program to find the sum of individual digits of a positive integer.
b) A Fibonacci sequence is defined as follows: The first and second terms in the sequence are 0 and 1. Subsequent terms are found by adding the preceding two terms in the sequence. Write a C program to generate the first n terms in the sequence.
c) Write a C program to generate all the prime numbers between 1 and n, when n is a value supplied by the user.

**Experiment no.2**

a) Write a C program to calculate the following sum:
   \[
   \text{Sum}=1 - x^2/2! + x^4/4! - x^6/6! + x^8/8! - x^{10}/10!
   \]
b) Write a C program to find the roots of a quadratic equation.

**Experiment no.3**

a) Write C programs that use both recursive and nonrecursive functions.
   I. To find a factorial of given numbers.
   II. To find GCD (Greatest common divisor) of two given numbers.
   III. To solve Towers Of Hanoi problem.

**Experiment no.4**

a) Write a C program to find both the largest and smallest number in a list of integers.
b) Write a C program that uses functions to perform the following:
   i. Addition of two matrices.
ii. Multiplication of two matrices.

Experiment no.5

a) Write a C program that uses functions to perform the operations:
   I. To insert a substring into a given main string from a from a given position.
   II. To delete n characters from a given position in the given string.

b) Write a C program to determine if the given string is palindrome or not.

Experiment no.6

a) Write a C program to construct a pyramid of numbers.
b) Write a C program to count the lines, words and characters in a given text.

Experiment no.7

Write a program to pass a 2-D array to a function and returning the same array from function.

Experiment no.8

Suppose 7 names are stored in an array of pointers names[] as shown below

char *names[] = { "santosh","amol","prakash","kishore","rahul","hemant","nilima"};

Write a program to arrange these names in alphabetical order.

Experiment no.9

a) Write a C program that uses functions to perform the operations:
   I. Reading a complex number.
   II. Writing a complex number.
   III. Addition of two complex numbers.
   IV. Multiplication of two complex numbers.
   (NOTE: represent complex number using a structure)

Experiment no.10

a) Write a C program which copies one file to another.
b) Write a C program to reverse the first n character in a file.
   (NOTE: The file name and n are specified on the command line)

BECS1210 DATA STRUCTURE USING ‘C’ LABORATORY (0-0-3)

1. Write a program to search an element using sequential search.
2. Write a program to search an element using binary search.
3. Write a program to sort N number of elements using selection sort.
4. Write a program to sort N number of elements using bubble sort.
5. Write a program to implement stack operation using an array.
6. Write a program to convert an infix to postfix notation using stack.
7. Write a program to convert an infix to prefix notation using stack.
8. Write a program to implement queue operation using array.
9. Write a program to implement circular queue operation using array.
10. Write a program to implement link list (creation, insertion, deletion).
11. Write a program to append two link lists.
12. Write a program to implement circular link list (creation, insertion, deletion).
13. Write a program to implement double link list (creation, insertion, deletion).
14. Write a program to construct binary tree and traverse (inorder, preorder, postorder).
15. Write a program to construct a graph and traverse in DFS.
16. Write a program to construct a graph and traverse in BFS.
17. Write a program to sort N number of elements using quick sort.
18. Write a program to sort N number of elements using merge sort.
19. Write a program to sort N number of elements using heap sort.

HUMG1111 COMMUNICATIVE ENGLISH LABORATORY (0-0-3)

OBJECTIVE:

The language lab acts as a platform for learning, practicing and producing language skills through interactive lessons and communicative mode of teaching-learning

• Practice should be student centric; guidance should be given for self study, emphasis on learning from mistakes

• To enable them to learn better pronunciation through stress on word accent, intonation, and rhythm

• To maintain linguistic - accuracy in grammar, pronunciation and vocabulary

A student is required to take up five lab tests of 100 marks - three tests in spoken mode and two tests in written mode.

The suggestive assignments in the lab are intended as learning activities to assist the student in accomplishing the course objectives:

I. FRIENDLY COMMUNICATION: SPEECH ACTS

i. Conversation Practice in familiar situations with help of situational role plays, appropriate language use
ii. Doing Things with Words: To ask for information, help, permission; To instruct, command, request, accept, refuse, prohibit, persuade

ii. Practice of Formulaic Expressions: Greetings, farewells, introductions, thanks, apologies, regrets, good wishes, congratulations, condolences, offers.

II. GRAMMAR AND VOCABULARY 8 hours

The focus will be on the appropriate usage of language.

i. Elimination of Common Errors & Bias

ii. Editing Passages

iii. Vocabulary Building Exercises Through Context

III. PHONEMIC TRANSCRIPTION 5 hours

Students will be trained to find out the correct pronunciation of words with the help of a dictionary, to enable them to monitor and correct their own pronunciation.

i. Transcription of Words and short sentences in normal English orthography (writing)

ii. into their IPA equivalents

iii. Transcription of Words Presented Orally

iv. Conversion of Words presented through IPA symbols into normal orthography

v. Syllable Division and Stress Marking (in words presented in IPA form)

IV. LISTENING 6 hours

Listening with a Focus on Pronunciation (ear-training): Segmental sounds, stress, weak forms, intonation

(*Students should be exposed, if possible, to the following varieties of English during listening practice: Standard Indian, British and American.)

V. SPEAKING 6 hours

i. Pronunciation Practice (for accent neutralization), particularly of Problem Sounds, in Isolated Words as well as Sentences
ii. Practising Word Stress, Rhythm in Sentences, Weak Forms, Intonation

iii. Reading Aloud of Dialogues, Poems, Excerpts from Plays, Speeches etc. for Practice in Pronunciation

**HUMG1211 BUSINESS COMMUNICATIVE LABORATORY (0-0-3)**

The learning activities should guide and accomplish the course objectives:

- Acquire different language skills
- Strengthen Business Performance Skills

A student is required to take up five lab tests of 100 marks- three tests in written mode and two tests in spoken mode.

**LISTENING**

6 hours

Exercises on Active Listening: The whole group listens to any speech/news broadcast in English and notes down the important points. They listen again to check their points and evaluate themselves. The group then compares points to see how well they have understood the broadcast.

**SPEAKING**

8 hours

1. Situational Dialogues / Role Play: Organization Communication
2. Oral Presentations- Prepared and Extempore
3. ‘Just a Minute’ Sessions (JAM)
4. Event Narration
5. Debates
6. Mock Meetings
7. Group Discussions on Current Topics

**READING**

8 hours

Students will be given practice in reading and comprehension of 6-8 passages of 100-300 words each, on topics of General as well as professional interest. The texts will be supported by suitable exercises designed to foster comprehension skills and vocabulary enrichment. Students
are encouraged to read newspapers, articles, books and novels, for improving reading skills like skimming, scanning, evaluative & inferential reading, reading to sum up and topicalize.

Sub Skills of Reading.
1. Reading for Comprehension
2. Vocabulary Exercises
3. Study skills like Note Making
4. Reference Skills : Using dictionary, Reference and Bibliography
5. Reading Between Lines & Beyond Text

WRITING 8 hours

The content for the lab is designed to acquaint the students not only on the techniques of effective writing but also give them insight into planning and writing of effective documents.

1. Short Paragraphs on Current, General and Technical Topics
2. Creative Writing: Idea Generation from Brain Storming & Mapping
3. Business Letters, Email Messages, Project Writing

(* Students will be required to produce and submit by the end of second semester a 350-500 word project report on a topic of their choice. The project should involve data collection, analysis and reporting. Ten marks (out of 100 marks allocated for Lab Test) will be set apart for the project.)