# JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD

(Established by Andhra Pradesh Act No.30 of 2008)

Kukatpally, Hyderabad - 500 085, Andhra Pradesh (India)

## B.TECH. MECHANICAL ENGINEERING

### I YEAR

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**Note:** All End Examinations (Theory and Practical) are of three hours duration.

**T-Tutorial** | **L – Theory** | **P – Practical/Drawing** | **C – Credits**
JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD  
(Established by Andhra Pradesh Act No.30 of 2008)  
Kukatpally, Hyderabad - 500 085, Andhra Pradesh (India)  

Mining Machinery)  

R13 COURSE STRUCTURE AND SYLLABUS  

I YEAR  

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1. INTRODUCTION:
In view of the growing importance of English as a tool for global communication and the consequent emphasis on training students to acquire communicative competence, the syllabus has been designed to develop linguistic and communicative competencies of Engineering students. The prescribed books and the exercises are meant to serve broadly as students' handbooks.

In the English classes, the focus should be on the skills of reading, writing, listening and speaking and for this the teachers should use the text prescribed for detailed study. For example, the students should be encouraged to read the texts/selected paragraphs silently. The teachers can ask comprehension questions to stimulate discussion and based on the discussions students can be made to write short paragraphs/essays etc. The text for non-detailed study is for extensive reading/reading for pleasure. Hence, it is suggested that they read it on their own the topics selected for discussion in the class. The time should be utilized for working out the exercises given after each section, as also for supplementing the exercises with authentic materials of a similar kind for example, from newspaper articles, advertisements, promotional material etc.. However, the stress in this syllabus is on skill development, fostering ideas and practice of language skills.

2. OBJECTIVES:
   a. To improve the language proficiency of the students in English with emphasis on LSRW skills.
   b. To equip the students to study academic subjects more effectively using the theoretical and practical components of the English syllabus.
   c. To develop the study skills and communication skills in formal and informal situations.

LEARNING OUTCOMES:
   1. Usage of English Language, written and spoken.
   2. Enrichment of comprehension and fluency.

SYLLABUS:
Listening Skills:
   Objectives
   1. To enable students to develop their listening skill so that they may appreciate its role in the LSRW skills approach to language and improve their pronunciation.
   2. To equip students with necessary training in listening so that they can comprehend the speech of people of different backgrounds and regions.

Students should be given practice in listening to the sounds of the language to be able to recognise them, to distinguish between them to mark stress and recognise and use the right intonation in sentences.

   • Listening for general content
   • Listening to fill up information
   • Intensive listening
   • Listening for specific information

Speaking Skills:
   Objectives
   1. To make students aware of the role of speaking in English and its contribution to their success.
   2. To enable students to express themselves fluently and appropriately in social and professional contexts.

   • Oral practice
   • Describing objects/situations/people
   • Role play – Individual/Group activities (Using exercises from the five units of the prescribed text: *Skills Annexe - Functional English for Success*)
   • Just A Minute(JAM) Sessions.

Reading Skills:
   Objectives
   1. To develop an awareness in the students about the significance of silent reading and comprehension.
   2. To develop the ability of students to guess the meanings of words from context and grasp the overall message of the text, draw inferences etc.

   • Skimming the text
   • Understanding the gist of an argument
• Identifying the topic sentence
• Inferring lexical and contextual meaning
• Understanding discourse features
• Scanning
• Recognizing coherence/sequencing of sentences

NOTE: The students will be trained in reading skills using the prescribed text for detailed study. They will be examined in reading and answering questions using ‘unseen’ passages which may be taken from authentic texts, such as magazines/newspaper articles.

Writing Skills:
Objectives
1. To develop an awareness in the students about writing as an exact and formal skill
2. To equip them with the components of different forms of writing, beginning with the lower order ones.

• Writing sentences
• Use of appropriate vocabulary
• Paragraph writing
• Coherence and cohesiveness
• Narration / description
• Note Making
• Formal and informal letter writing
• Describing graphs using expressions of comparison

TEXTBOOKS PRESCRIBED:
In order to improve the proficiency of the student in the acquisition of the four skills mentioned above, the following texts and course content, divided into Five Units, are prescribed:

For Detailed study: First Textbook: “Skills Annexe -Functional English for Success”, Published by Orient Black Swan, Hyderabad

For Non-detailed study
1. Second text book “Epitome of Wisdom”, Published by Maruthi Publications, Guntur

The course content and study material is divided into Five Units.

Unit –I:
1. Chapter entitled ‘Wit and Humour’ from ‘Skills Annexe -Functional English for Success’, Published by Orient Black Swan, Hyderabad
2. Chapter entitled ‘Mokshagundam Visvesvaraya’ from “Epitome of Wisdom”, Published by Maruthi Publications, Hyderabad.

L-Listening For Sounds, Stress and Intonation
S-Greeting and Taking Leave, Introducing Oneself and Others (Formal and Informal Situations)
R- Reading for Subject/ Theme
W- Writing Paragraphs
G-Types of Nouns and Pronouns
V- Homonyms, homophones synonyms, antonyms

Unit –II
1. Chapter entitled “Cyber Age” from “Skills Annexe -Functional English for Success” Published by Orient Black Swan, Hyderabad.

L – Listening for themes and facts
S – Apologizing, interrupting, requesting and making polite conversation
R- for theme and gist
W- Describing people, places, objects, events
G- Verb forms
V- noun, verb, adjective and adverb

Unit –III
1. Chapter entitled ‘Risk Management’ from “Skills Annexe -Functional English for Success” Published by Orient Black Swan, Hyderabad
2. Chapter entitled ‘Leela’s Friend’ by R.K. Narayan from “Epitome of Wisdom”, Published by Maruthi Publications, Hyderabad
L – for main points and sub-points for note taking
S – giving instructions and directions; Speaking of hypothetical situations
R – reading for details
W – note-making, information transfer, punctuation
G – present tense
V – synonyms and antonyms

Unit –IV
1. Chapter entitled ‘Human Values and Professional Ethics’ from “Skills Annexe -Functional English for Success” Published by Orient Black Swan, Hyderabad
2. Chapter entitled ‘The Last Leaf’ from “Epitome of Wisdom”, Published by Maruthi Publications, Hyderabad

L -Listening for specific details and information
S- narrating, expressing opinions and telephone interactions
R -Reading for specific details and information
W- Writing formal letters and CVs
G- Past and future tenses
V- Vocabulary - idioms and Phrasal verbs

Unit –V
1. Chapter entitled ‘Sports and Health’ from “Skills Annexe -Functional English for Success” Published by Orient Black Swan, Hyderabad
2. Chapter entitled ‘The Convocation Speech’ by N.R. Narayanmurthy’ from “Epitome of Wisdom”, Published by Maruthi Publications, Hyderabad

L- Critical Listening and Listening for speaker’s tone/ attitude
S- Group discussion and Making presentations
R- Critical reading, reading for reference
W-Project proposals; Technical reports, Project Reports and Research Papers
G- Adjectives, prepositions and concord
V- Collocations and Technical vocabulary
Using words appropriately
* Exercises from the texts not prescribed shall also be used for classroom tasks.

REFERENCES :
5. Effective English, edited by E Suress Kumar, A RamaKrishna Rao, P Sreeshari, Published by Pearson
8. Technical Communication, Meenakshi Raman, Oxford University Press
9. Objective English Edgar Thorpe & Showick Thorpe. Pearson Education
11. Murphy’s English Grammar with CD, Murphy, Cambridge University Press.
12. Everyday Dialogues in English, Robert J. Dixon, Prentice Hall India Pvt Ltd.,
14. Basic Vocabulary Edgar Thorpe & Showick Thorpe, Pearson Education
18. Enrich your English, Thakur K B P Sinha, Vijay Nicole Imprints Pvt Ltd.,
I Year B.Tech.

MATHEMATICS-I

UNIT-I

UNIT – II
Differential calculus methods. Rolle’s Mean value Theorem – Lagrange’s Mean Value Theorem – Cauchy’s mean value Theorem – (all theorems without proof but with geometrical interpretations), verification of the Theorems and testing the applicability of these theorem to the given function. Functions of several variables: Functional dependence- Jacobian- Maxima and Minima of functions of two variables without constraints and with constraints-Methode of Lagrange multipliers.

UNIT – III
Improper integration, Multiple integration & applications: Gamma and Beta Functions –Relation between them, their properties – evaluation of improper integrals using Gamma / Beta functions. Multiple integrals – double and triple integrals – change of order of integration- change of variables (polar, cylindrical and spherical) Finding the area of a region using double integration and volume of a region using triple integration.

UNIT – IV
Differential equations and applications. Overview of differential equations- exact, linear and Bernoulli (NOT TO BE EXAMINED). Applications of first order differential equations – Newton’s Law of cooling, Law of natural growth and decay, orthogonal trajectories. Linear differential equations of second and higher order with constant coefficients, Non-homogeneous term of the type \( f(x) = e^{ax}, \sin ax, \cos ax, \text{ and } x^n, e^{ax} V(x), x^n V(x), \) method of variation of parameters. Applications to bending of beams, Electrical circuits and simple harmonic motion.

UNIT – V
Laplace transform and its applications to Ordinary differential equations Definition of Integral transform, Domain of the function and Kernel for the Laplace transforms. Existence of Laplace transform. Laplace transform of standard functions, first shifting Theorem, Laplace transform of functions when they are multiplied or divided by “t”. Laplace transforms of derivatives and integrals of functions. – Unit step function – second shifting theorem – Dirac’s delta function, Periodic function – Inverse Laplace transform by Partial fractions(Heaviside method) Inverse Laplace transforms of functions when they are multiplied or divided by “s”, Inverse Laplace Transforms of derivatives and integrals of functions, Convolution theorem — Solving ordinary differential equations by Laplace transforms.

TEXT BOOKS:

REFERENCES:
JAWAHRLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD

I Year B.Tech.

ENGINEERING MECHANICS

UNIT – I


UNIT – II


UNIT – III
CENTROIDS AND CENTERS OF GRAVITY: Introduction – Centroids and Centre of gravity of simple figures (from basic principles ) – Centroids of Composite Figures - Theorem of Pappus – Center of gravity of bodies and centroids of volumes.

Moments of Inertia: Definition – Polar Moment of Inertia –Radius of gyration - Transfer formula for moment of inertia - Moments of Inertia for Composite areas - Products of Inertia, Transfer Formula for Product of Inertia.

Mass Moment of Inertia: Moment of Inertia of Masses- Transfer Formula for Mass Moments of Inertia - mass moment of inertia of composite bodies.

UNIT – IV
KINEMATICS OF A PARTICLE: Motion of a particle – Rectilinear motion – motion curves – Rectangular components of curvilinear motion- Kinematics of Rigid Body - Types of rigid body motion -Angular motion - Fixed Axis Rotation


UNIT – V


TEXT BOOKS:

REFERENCES:
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I Year B.Tech.

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ENGINEERING PHYSICS

UNIT-I

UNIT-II
3. Principles of Quantum Mechanics: Waves and Particles, de Broglie Hypothesis, Matter Waves, Davisson and Germer’s Experiment, Heisenberg’s Uncertainty Principle, Schrödinger’s Time Independent Wave Equation - Physical Significance of the Wave Function – Infinite square well potential extension to three dimensions

UNIT-III

UNIT-IV
7. Optics: Interference-Interference in thin films(Reflected light), Newton rings experiment- Fraunhofer diffraction due to single slit, N-slits, Diffraction grating experiment , Double refraction-construction and working, Nicol’s Prism

UNIT-V:
10. Nanotechnology: Origin of Nanotechnology, Nano Scale, Surface to Volume Ratio, Quantum Confinement, Bottom-up Fabrication: Sol-gel, Top-down Fabrication: Chemical Vapour Deposition, Characterization by TEM.
TEXT BOOKS:
2. Engineering Physics, V. Rajendran, Tata Mc Graw Hill Book Publishers

REFERENCES:
1. Fundamentals of Physics, David Halliday, Robert Resnick, Jearl Walker by John Wiley & Sons
7. Modern Physics by K. Vijaya Kumar, S. Chandralingam: S. Chand & Co.Ltd
11. Applied Physics – Mani Naidu Pearson Education
I Year B.Tech.

**ENGINEERING CHEMISTRY**

### UNIT I: Electrochemistry & Corrosion:

- Electro Chemistry – Conductance - Specific, Equivalent and Molar conductance and their Units; Applications of Conductance (Conductometric titrations).
- **EMF:** Galvanic Cells, types of Electrodes – (Calomel, Quinhydrone and glass electrodes); Nernst equation and its applications: concept of concentration cells, electro chemical series, Potentiometric titrations, determination of $pH$ using glass electrode - Numerical problems.
- **Batteries:** Primary cells (dry cells) and secondary cells (lead-acid cell, Ni-Cd cell, Lithium cells). Applications of batteries.
- **Corrosion and its control:** Causes and effects of corrosion; Theories of corrosion – Chemical & Electrochemical corrosion; Types of corrosion (Galvanic, Water line, Pitting and Intergranular); Factors affecting rate of corrosion – Nature of metal and Nature of Environment – Corrosion control methods – Cathodic protection (sacrificial anodic and impressed current).
- Surface coatings: Metallic coatings & methods of application of metallic coatings - hot dipping (galvanization & tinning), Cementation, cladding, electroplating (copper plating) Electroless plating (Ni plating) - Organic coatings – Paints - constituents and their functions.

### UNIT II: Engineering Materials:

- **Polymers:** Types of Polymerization (Chain & Step growth).
- **Plastics:** Thermoplastic & Thermo setting resins; Compounding & fabrication of plastics (Compression and injection moulding). Preparation, properties, engineering applications of PVC, Teflon & Bakelite.
- **Fibers:** Characteristics of fibers – preparation, properties and uses of Nylon – 6,6 and Dacron – Fiber Reinforced Plastics (FRP) – applications.
- **Rubbers:** Natural rubber and its vulcanization. Elastomers – Buna-s, Butyl rubber and Thiokol rubber.
- **Conducting polymers:** Polyacetylene, Polyaniline, Mechanism of Conduction, doping; applications of Conducting polymers.
- **Bio-degradable Polymers:** preparation and Applications of Poly vinyl acetate and Poly lactic acid - Cement: composition of Portland cement, setting & hardening of cement (reactions),
- **Lubricants:** Classification with examples; Characteristics of a good lubricant & mechanism of lubrication (thick film, thin film and extreme pressure) – properties of lubricants: viscosity, Cloud point, flash and fire points.
- **Refractories:** Classification, characteristics of a good refractory and applications.
- **Nanomaterials:** Introduction, preparation by sol-gel & chemical vapour deposition methods. Applications of nanomaterials.

### UNIT III: Water and its Treatment:


### Unit – IV : Fuels & Combustion

- **Combustion** – Definition, Calorific value of fuel – HCV , LCV; Determination of calorific value by Junker’s gas calorimeter – theoretical calculation of Calorific value by Dulong’s formula – Numerical problems on combustion.

### UNIT V: Phase Rule & Surface Chemistry

- **Phase Rule:** Definition of terms: Phase, component, degree of freedom, phase rule equation. Phase diagrams – one component system - water system. Two component system Lead- Silver, cooling curves, heat treatment based on iron-carbon phase diagram - hardening, annealing and normalization.
- **Surface Chemistry: Adsorption** – Types of Adsorption, Isotherms – Freundlich and Langmuir adsorption isotherm, applications of adsorption; **Colloids:** Classification of Colloids; Electrical & optical properties, micelles, applications of colloids in industry.

**TEXT BOOKS:**

REFERENCE BOOKS

COMPUTER PROGRAMMING

Objectives:

- To understand the various steps in Program development.
- To understand the basic concepts in C Programming Language.
- To learn how to write modular and readable C Programs
- To learn to write programs (using structured programming approach) in C to solve problems.
- To introduce the students to basic data structures such as lists, stacks and queues.
- To make the student understand simple sorting and searching methods.

Outcomes:

UNIT - I
Introduction to Computers – Computer Systems, Computing Environments, Computer Languages, Creating and running programs, Program Development.
Introduction to the C Language – Background, C Programs, Identifiers, Types, Variables, Constants, Input / Output, Operators (Arithmetic, relational, logical, bitwise etc.), Expressions, Precedence and Associativity, Expression Evaluation, Type conversions, Statements- Selection Statements(making decisions) – if and switch statements, Repetition statements (loops)-while, for, do-while statements, Loop examples, other statements related to looping – break, continue, goto, Simple C Program examples.

UNIT - II
Functions-Designing Structured Programs, Functions, user defined functions, inter function communication, Standard functions, Scope, Storage classes-auto, register, static, extern, scope rules, type qualifiers, recursion- recursive functions, Limitations of recursion, example C programs, Preprocessor commands.
Arrays – Concepts, using arrays in C, inter function communication, array applications, two – dimensional arrays, multidimensional arrays, C program examples.

UNIT - III
Pointers – Introduction (Basic Concepts), Pointers for inter function communication, pointers to pointers, compatibility, Pointer Applications-Arrays and Pointers, Pointer Arithmetic and arrays, Passing an array to a function, memory allocation functions, array of pointers, programming applications, pointers to void, pointers to functions.
Strings – Concepts, C Strings, String Input / Output functions, arrays of strings, string manipulation functions, string / data conversion, C program examples.

UNIT - IV
Enumerated, Structure ,and Union Types– The Type Definition(typedef), Enumerated types, Structures –Declaration, initialization, accessing structures, operations on structures, Complex structures, structures and functions, Passing structures through pointers, self referential structures, unions, bit fields, C programming examples, command –line arguments,
Input and Output – Concept of a file, streams, text files and binary files, Differences between text and binary files, State of a file, Opening and Closing files, file input / output functions (standard library input / output functions for files), file status functions (error handling),Positioning functions, C program examples.

UNIT - V
Searching and Sorting – Sorting- selection sort, bubble sort, Searching-linear and binary search methods,
Lists- Linear list – singly linked list implementation, insertion, deletion and searching operations on linear list, Stacks-Push and Pop Operations, Queues- Enqueue and Dequeue operations.

TEXT BOOKS:
REFERENCE BOOKS:

2. C for All, S. Thamarai Selvi, R.Murugesan, Anuradha Publications.
5. Programming with C, B.Gottfried, 3rd edition, Schaum’s outlines, TMH.
6. Problem solving with C, M.T.Somasekhara, PHI.
10. The C Programming Language, B.W. Kernighan and Dennis M.Ritchie, PHI.
JAWAHRLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD

I Year B.Tech.

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ENGINEERING DRAWING

UNIT – I

Curves: Constructions of Curves used in Engineering Practice:
   a) Conic Sections including the Rectangular Hyperbola – General method only.
   b) Cycloid, Epicycloid and Hypocycloid
   c) Involute.
Scales: Construction of different types of Scales, Plain, Diagonal, Vernier scale.

UNIT – II
ORTHOGRAPHIC PROJECTIONS IN FIRST ANGLE
PROJECTION: Principles of Orthographic Projections – Conventions – First and Third Angle projections.

Projections of Points, including Points in all four quadrants.

Projections of Lines - Parallel, perpendicular, inclined to one plan and inclined to both planes. True length and true angle of a line. Traces of a line.

PROJECTIONS OF PLANES: Plane parallel, perpendicular and inclined to one reference plane. Plane inclined to both the reference planes.

UNIT – III
PROJECTIONS OF SOLIDS: Projections of regular solids, cube, prisms, pyramids, tetrahedron, cylinder and cone, axis inclined to both planes.

SECTIONS AND SECTIONAL VIEWS: Right Regular Solids – Prism, Cylinder, Pyramid, Cone – use of Auxiliary views.

UNIT – IV
DEVELOPMENT OF SURFACES: Development of Surfaces of Right, Regular Solids – Prisms, Cylinder, Pyramids, Cone and their parts. Frustum of solids.

INTERSECTION OF SOLIDS:- Intersection of Cylinder Vs Cylinder, Cylinder Vs Prism, Cylinder Vs Cone.

UNIT – V


PERSPECTIVE PROJECTIONS: Perspective View: Points, Lines and Plane Figures, Vanishing Point Methods (General Method only).

TEXT BOOKS
1. Engineering Drawing – Basant, Agrawal, TMH
2. Engineering Drawing, N.D. Bhatt

REFERENCES:
COMPUTER PROGRAMMING LAB

Objectives:
- To write programs in C to solve the problems.
- To implement linear data structures such as lists, stacks, queues.
- To implement simple searching and sorting methods.

Outcomes:

Recommended Systems/Software Requirements:
- Intel based desktop PC
- ANSI C Compiler with Supporting Editors

Week 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 of the sequence.

c) Write a C program to generate all the prime numbers between 1 and n, where n is a value supplied by the user.

Week 2
a) Write a C program to calculate the following Sum:
   \[ S = 1 - x^2/2! + x^4/4! - x^6/6! + x^8/8! - x^{10}/10! \]

b) Write a C program to find the roots of a quadratic equation.

Week 3
a) The total distance travelled by vehicle in 't' seconds is given by distance
   \[ d = ut + \frac{1}{2}at^2 \]
   where 'u' and 'a' are the initial velocity (m/sec.) and acceleration (m/sec^2). Write C program to find the distance travelled at regular intervals of time given the values of 'u' and 'a'. The program should provide the flexibility to the user to select his own time intervals and repeat the calculations for different values of ‘u’ and ‘a’.

b) Write a C program, which takes two integer operands and one operator from the user, performs the operation and then prints the result. (Consider the operators +, -, *, /, % and use Switch Statement)

Week 4
a) Write C programs that use both recursive and non-recursive functions
   i) To find the factorial of a given integer.
   ii) To find the GCD (greatest common divisor) of two given integers.

Week 5
a) Write a C program to find the largest integer 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

Week 6
a) Write a C program that uses functions to perform the following operations:
   i) To insert a sub-string in to a given main string from a given position.
   ii) To delete n Characters from a given position in a given string.

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

Week 7
a) Write a C program that displays the position or index in the string S where the string T begins, or –1 if S doesn't contain T.

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

Week 8
a) Write a C program to generate Pascal's triangle.

b) Write a C program to construct a pyramid of numbers.

Week 9
Write a C program to read in two numbers, x and n, and then compute the sum of this geometric progression:
\[ 1+x+x^2+x^3+\ldots+ x^n \]
For example: if n is 3 and x is 5, then the program computes 1+5+25+125.
Print x, n, the sum
Perform error checking. For example, the formula does not make sense for negative exponents – if n is less than 0. Have your program print an error message if n<0, then go back and read in the next pair of numbers without computing the sum. Are any values of x also illegal? If so, test for them too.

Week 10
a) 2’s complement of a number is obtained by scanning it from right to left and complementing all the bits after the first appearance of a 1. Thus 2’s complement of 11100 is 00100. Write a C program to find the 2’s complement of a binary number.
b) Write a C program to convert a Roman numeral to its decimal equivalent.

Week 11
Write a C program that uses functions to perform the following 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.)

Week 12
a) Write a C program which copies one file to another.
b) Write a C program to reverse the first n characters in a file.
(Note: The file name and n are specified on the command line.)

Week 13
a) Write a C program to display the contents of a file.
b) Write a C program to merge two files into a third file (i.e., the contents of the first file followed by those of the second are put in the third file)

Week 14
a) Write a C program that uses non recursive function to search for a Key value in a given list of integers using Linear search.
b) Write a C program that uses non recursive function to search for a Key value in a given sorted list of integers using Binary search.

Week 15
a) Write a C program that implements the Selection sort method to sort a given array of integers in ascending order.
b) Write a C program that implements the Bubble sort method to sort a given list of names in ascending order.

Week 16
Write a C program that uses functions to perform the following operations:
   i) Create a singly linked list of integer elements.
   ii) Traverse the above list and display the elements.

Week 17
Write a C program that implements stack (its operations) using a singly linked list to display a given list of integers in reverse order. Ex. input: 10 23 4 6 output: 6 4 23 10

Week 18
Write a C program that implements Queue (its operations) using a singly linked list to display a given list of integers in the same order. Ex. input: 10 23 4 6 output: 10 23 4 6

Week 19
Write a C program to implement the linear regression algorithm.

Week 20
Write a C program to implement the polynomial regression algorithm.

Week 21
Write a C program to implement the Lagrange interpolation.

Week 22
Write a C program to implement the Newton-Gregory forward interpolation.

Week 23
Write a C program to implement Trapezoidal method.

Week 24
Write a C program to implement Simpson method.

TEXT BOOKS:
5. C and Data Structures, N.B.Venkateswarlu and E.V.Prasad, S.Chand Publishers
ENGINEERING PHYSICS LAB
(Any TEN experiments compulsory)

1. Dispersive power of the material of a prism – Spectrometer
5. Time constant of an R-C circuit.
6. L-C-R circuit.
7. Magnetic field along the axis of current carrying coil – Stewart and Gees method.
8. Study the characteristics of LED and LASER sources.
10. Energy gap of a material of p-n junction.
11. Torsional pendulum.
13. Characteristics of a solar cell

LABORATORY MANUAL:
1. Laboratory Manual of Engineering Physics by Dr.Y. Aparna & Dr.K. Venkateswara Rao (V.G.S Publishers)

OBJECTIVES
This course on Physics lab is designed with 13 experiments in an academic year. It is common to all branches of Engineering in B.Tech Ist year.
The objective of the course is that the student will have exposure to various experimental skills which is very essential for an Engineering student.
The experiments are selected from various area of Physics like Physical Optics, Lasers, Fiber Optics, Sound, Mechanics, Electricity & Magnetism and Basic Electronics.
Also the student is exposed to various tools like Screw gauge, Vernier Callipers, Physics Balance , Spectrometer and Microscope.

OUTCOME
The student is expected to learn from this laboratory course the concept of error and its analysis. It also allows the student to develop experimental skills to design new experiments in Engineering.
With the exposure to these experiments the student can compare the theory and correlate with experiment.

ENGINEERING CHEMISTRY LAB
List of Experiments (Any 12 of the following):

Titrimetry:
1. Estimation of ferrous iron by dichrometry.
2. Estimation of hardness of water by EDTA method.

Mineral analysis:
3. Determination of percentage of copper in brass.
4. Estimation of manganese dioxide in pyrolusite.

Instrumental Methods:
Colorimetry:
5. Determination of ferrous iron in cement by colorimetric method

Conductometry:
7. Conductometric titration of strong acid vs strong base.
8. Conductometric titration of mixture of acids vs strong base.

Potentiometry:
9. Titration of strong acid vs strong base by potentiometry.
10. Titration of weak acid vs strong base by potentiometry.

Physical properties:
11. Determination of viscosity of sample oil by redwood / oswald’s viscometer.
12. Determination of Surface tension of lubricants.

Preparations:
13. Preparation of Aspirin
14. Preparation of Thiokol rubber

Adsorption:
15. Adsorption of acetic acid on charcoal.

TEXT BOOKS:
2. Inorganic quantitative analysis, Vogel.

REFERENCE BOOKS:
1. Text Book of engineering chemistry by R. N. Goyal and Harmendra Goel, Ane Books Private Ltd.,
JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD

I Year B.Tech.

ENGLISH LANGUAGE COMMUNICATION SKILLS LAB

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- - 3/2

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

Objectives

- To facilitate computer-aided multi-media instruction enabling individualized and independent language learning
- To sensitise the students to the nuances of English speech sounds, word accent, intonation and rhythm
- To bring about a consistent accent and intelligibility in their pronunciation of English by providing an opportunity for practice in speaking
- To improve the fluency in spoken English and neutralize mother tongue influence
- To train students to use language appropriately for interviews, group discussion and public speaking

Learning Outcomes:

1. Better Understanding of nuances of language through audio-visual experience and group activities
2. Neutralization of accent for intelligibility
3. Speaking with clarity and confidence thereby enhancing employability skills of the students

Syllabus: English Language Communication Skills Lab shall have two parts:

a. Computer Assisted Language Learning (CALL) Lab
b. Interactive Communication Skills (ICS) Lab

The following course content is prescribed for the English Language Communication Skills Lab

Exercise – I
CALL Lab: Introduction to Phonetics – Speech Sounds – Vowels and Consonants
ICS Lab: Ice-Breaking activity and JAM session
Articles, Prepositions, Word formation- Prefixes & Suffixes, Synonyms & Antonyms

Exercise – II
CALL Lab: Structure of Syllables - Past Tense Marker and Plural Marker – Weak Forms and Strong Forms - Consonant Clusters.
Concord (Subject in agreement with verb) and Words often misspelt- confused/misused

Exercise - III
CALL Lab: Minimal Pairs- Word accent and Stress Shifts- Listening Comprehension.
ICS Lab: Descriptions- Narrations- Giving Directions and guidelines.
Sequence of Tenses, Question Tags and One word substitutes.

Exercise – IV
CALL Lab: Intonation and Common errors in Pronunciation.
ICS Lab: Extempore- Public Speaking
Active and Passive Voice, –Common Errors in English, Idioms and Phrases

Exercise – V
CALL Lab: Neutralization of Mother Tongue Influence and Conversation Practice
ICS Lab: Information Transfer- Oral Presentation Skills
Reading Comprehension and Job Application with Resume preparation.

Minimum Requirement of infra structural facilities for ELCS Lab:

1. Computer Assisted Language Learning (CALL) Lab:
The Computer aided Language Lab for 40 students with 40 systems, one master console, LAN facility and English language software for self-study by learners.
System Requirement (Hardware component):

Computer network with Lan with minimum 60 multimedia systems with the following specifications:

i) P – IV Processor
   a) Speed – 2.8 GHZ
   b) RAM – 512 MB Minimum
   c) Hard Disk – 80 GB

ii) Headphones of High quality

2. Interactive Communication Skills (ICS) Lab:

The Interactive Communication Skills Lab: A Spacious room with movable chairs and audio-visual aids with a Public Address System, a T. V., a digital stereo – audio & video system and camcorder etc.

Books Suggested for English Language Lab Library (to be located within the lab in addition to the CDs of the text book which are loaded on the systems):

2. Strengthen Your Steps - Dr. M. Hari Prasad and others, Maruthi Publications
4. Sasi Kumar, V & Dhamija, P.V. How to Prepare for Group Discussion and Interviews. Tata McGraw Hill
11. Spoken English (CIEFL) in 3 volumes with 6 cassettes, OUP.
13. A textbook of English Phonetics for Indian Students by T. Balasubramanian (Macmillan)

DISTRIBUTION AND WEIGHTAGE OF MARKS

English Language Laboratory Practical Examination:

1. The practical examinations for the English Language Laboratory shall be conducted as per the University norms prescribed for the core engineering practical sessions.

2. For the Language lab sessions, there shall be a continuous evaluation during the year for 25 sessional marks and 50 year-end Examination marks. Of the 25 marks, 15 marks shall be awarded for day-to-day work and 10 marks to be awarded by conducting Internal Lab Test(s). The year-end Examination shall be conducted by the teacher concerned with the help of another member of the staff of the same department of the same institution.
Objectives:
The IT Workshop for engineers is a training lab course spread over 54 hours. The modules include training on PC Hardware, Internet & World Wide Web and Productivity tools including Word, Excel and Power Point.

Outcomes:

PC Hardware introduces the students to a personal computer and its basic peripherals, the process of assembling a personal computer, installation of system software like MS Windows, Linux and the required device drivers. In addition hardware and software level troubleshooting process, tips and tricks would be covered. The students should work on working PC to disassemble and assemble to working condition and install Windows and Linux on the same PC. Students are suggested to work similar tasks in the Laptop scenario wherever possible.

Internet & World Wide Web module introduces the different ways of hooking the PC on to the internet from home and workplace and effectively usage of the internet. Usage of web browsers, email, newsgroups and discussion forums would be covered. In addition, awareness of cyber hygiene, i.e., protecting the personal computer from getting infected with the viruses, worms and other cyber attacks would be introduced.

Productivity tools module would enable the students in crafting professional word documents, excel spread sheets and power point presentations using the Microsoft suite of office tools and LaTeX. (Recommended to use Microsoft office 2007 in place of MS Office 2003)

PC Hardware
Week 1 – Task 1: Identify the peripherals of a computer, components in a CPU and its functions. Draw the block diagram of the CPU along with the configuration of each peripheral and submit to your instructor.

Week 2 – Task 2: Every student should disassemble and assemble the PC back to working condition. Lab instructors should verify the work and follow it up with a Viva. Also students need to go through the video which shows the process of assembling a PC. A video would be given as part of the course content.

Week 3 – Task 3: Every student should individually install MS windows on the personal computer. Lab instructor should verify the installation and follow it up with a Viva.

Week 4 – Task 4: Every student should install Linux on the computer. This computer should have windows installed. The system should be configured as dual boot with both windows and Linux. Lab instructors should verify the installation and follow it up with a Viva.

Week 5 – Task 5: Hardware Troubleshooting: Students have to be given a PC which does not boot due to improper assembly or defective peripherals. They should identify the problem and fix it to get the computer back to working condition. The work done should be verified by the instructor and followed up with a Viva.

Week 6 – Task 6: Software Troubleshooting: Students have to be given a malfunctioning CPU due to system software problems. They should identify the problem and fix it to get the computer back to working condition. The work done should be verified by the instructor and followed up with a Viva.

Internet & World Wide Web

Week 7 - Task 1: Orientation & Connectivity Boot Camp: Students should get connected to their Local Area Network and access the Internet. In the process they configure the TCP/IP setting. Finally students should demonstrate, to the instructor, how to access the websites and email. If there is no internet connectivity preparations need to be made by the instructors to simulate the WWW on the LAN.

Week 8 - Task 2: Web Browsers, Surfing the Web: Students customize their web browsers with the LAN proxy settings, bookmarks, search toolbars and pop up blockers. Also, plug-ins like Macromedia Flash and JRE for applets should be configured.
Week 9 - Task 3: Search Engines & Netiquette: Students should know what search engines are and how to use the search engines. A few topics would be given to the students for which they need to search on Google. This should be demonstrated to the instructors by the student.

Week 10 - Task 4: Cyber Hygiene: Students would be exposed to the various threats on the internet and would be asked to configure their computer to be safe on the internet. They need to first install antivirus software, configure their personal firewall and windows update on their computer. Then they need to customize their browsers to block pop ups, block active x downloads to avoid viruses and/or worms.

Week 11 - Task 5: Develop your home page using HTML Consisting of your photo, name, address and education details as a table and your skill set as a list.

Productivity tools

LaTeX and Word

Week 12 – Word Orientation: The mentor needs to give an overview of LaTeX and Microsoft (MS) office 2007/ equivalent (FOSS) tool word: Importance of LaTeX and MS office 2007/ equivalent (FOSS) tool Word as word Processors, Details of the three tasks and features that would be covered in each, using LaTeX and word – Accessing, overview of toolbars, saving files, Using help and resources, rulers, format painter.

Task 1 : Using LaTeX and Word to create project certificate. Features to be covered:- Formatting Fonts in word, Drop Cap in word, Applying Text effects, Using Character Spacing, Borders and Colors, Inserting Header and Footer, Using Date and Time option in both LaTeX and Word.

Week 13 - Task 2: Creating project abstract Features to be covered:- Formatting Styles, Inserting table, Bullets and Numbering, Changing Text Direction, Cell alignment, Footnote, Hyperlink, Symbols, Spell Check, Track Changes.

Week 14 - Task 3 : Creating a Newsletter : Features to be covered:- Table of Content, Newspaper columns, Images from files and clipart, Drawing toolbar and Word Art, Formatting Images, Textboxes, Paragraphs and Mail Merge in word.

Excel

Week 15 - Excel Orientation: The mentor needs to tell the importance of MS office 2007/ equivalent (FOSS) tool Excel as a Spreadsheet tool, give the details of the two tasks and features that would be covered in each. Using Excel – Accessing, overview of toolbars, saving excel files, Using help and resources.

Task 1: Creating a Scheduler - Features to be covered:- Gridlines, Format Cells, Summation, auto fill, Formatting Text

Week 16 - Task 2 : Calculating GPA - Features to be covered:- Cell Referencing, Formulae in excel – average, std. deviation, Charts, Renaming and Inserting worksheets, Hyper linking, Count function, LOOKUP/VLOOKUP, Sorting, Conditional formatting

LaTeX and MS/equivalent (FOSS) tool Power Point

Week 17 - Task1: Students will be working on basic power point utilities and tools which help them create basic power point presentation. Topic covered during this week includes :- PPT Orientation, Slide Layouts, Inserting Text, Word Art, Formatting Text, Bullets and Numbering, Auto Shapes, Lines and Arrows in both LaTeX and Power point. Students will be given model power point presentation which needs to be replicated (exactly how it’s asked).

Week 18- Task 2: Second week helps students in making their presentations interactive. Topic covered during this week includes: Hyperlinks, Inserting –Images, Clip Art, Audio, Video, Objects, Tables and Charts

Week 19 - Task 3: Concentrating on the in and out of Microsoft power point and presentations in LaTeX. Helps them learn best practices in designing and preparing power point presentation. Topic covered during this week includes: - Master Layouts (slide, template, and notes), Types of views (basic, presentation, slide slotter, notes etc), Inserting – Background, textures, Design Templates, Hidden slides.

REFERENCE BOOKS:
1. Introduction to Information Technology, ITL Education Solutions limited, Pearson Education.
2. LaTeX Companion – Leslie Lamport, PHI/Pearson.
4. Upgrading and Repairing, PC’s 18th e, Scott Muller QUE, Pearson Education
5. Comdex Information Technology course tool kit Vikas Gupta, WILEY Dreamtech
7. PC Hardware and A+Handbook – Kate J. Chase PHI (Microsoft)

ENGINEERING WORKSHOP

1. TRADES FOR EXERCISES:
   At least two exercises from each trade:
   1. Carpentry
   2. Fitting
   3. Tin-Smithy and Development of jobs carried out and soldering.
   4. Black Smithy
   5. House-wiring
   6. Foundry
   7. Welding
   8. Power tools in construction, wood working, electrical engineering and mechanical Engineering.

2. TRADES FOR DEMONSTRATION & EXPOSURE:
   1. Plumbing
   2. Machine Shop
   3. Metal Cutting (Water Plasma)

TEXT BOOK: