# ADITYA ENGINEERING COLLEGE

An Autonomous Institution

# B.TECH PROGRAMME CURRICULUM
(For the candidates admitted from 2017-18 onwards)

## COMPUTER SCIENCE AND ENGINEERING

### I SEMESTER

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Name of the Course</th>
<th>Category</th>
<th>Periods/Week</th>
<th>Credits (C)</th>
</tr>
</thead>
<tbody>
<tr>
<td>171HS1T01</td>
<td>English - I</td>
<td>HSS</td>
<td>3 1</td>
<td>3</td>
</tr>
<tr>
<td>171BS1T01</td>
<td>Mathematics-I</td>
<td>BS</td>
<td>3 1</td>
<td>3</td>
</tr>
<tr>
<td>171BS1T02</td>
<td>Mathematics-II</td>
<td>BS</td>
<td>3 1</td>
<td>3</td>
</tr>
<tr>
<td>171BS1T04</td>
<td>Applied Physics</td>
<td>BS</td>
<td>3 1</td>
<td>3</td>
</tr>
<tr>
<td>171ES1T03</td>
<td>Engineering Drawing</td>
<td>ES</td>
<td>3 1</td>
<td>3</td>
</tr>
<tr>
<td>171ES1T01</td>
<td>Computer Programming</td>
<td>ES</td>
<td>3 1</td>
<td>3</td>
</tr>
<tr>
<td>171HS1L01</td>
<td>English Communication Skills Lab-I</td>
<td>HSS</td>
<td>--- ---</td>
<td>3 2</td>
</tr>
<tr>
<td>171BS1L04</td>
<td>Applied Physics Lab</td>
<td>BS</td>
<td>--- ---</td>
<td>3 2</td>
</tr>
<tr>
<td>171ES1L01</td>
<td>Computer Programming Lab</td>
<td>ES</td>
<td>--- ---</td>
<td>3 2</td>
</tr>
<tr>
<td></td>
<td><strong>TOTAL</strong></td>
<td></td>
<td>18 6 11</td>
<td>24</td>
</tr>
</tbody>
</table>

### II SEMESTER

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Name of the Course</th>
<th>Category</th>
<th>Periods/Week</th>
<th>Credits (C)</th>
</tr>
</thead>
<tbody>
<tr>
<td>171HS2T03</td>
<td>English - II</td>
<td>HSS</td>
<td>3 1</td>
<td>3</td>
</tr>
<tr>
<td>171BS2T06</td>
<td>Mathematics- III</td>
<td>BS</td>
<td>3 1</td>
<td>3</td>
</tr>
<tr>
<td>171HS2T02</td>
<td>Environmental Studies</td>
<td>HSS</td>
<td>2 1</td>
<td>2</td>
</tr>
<tr>
<td>171BS2T05</td>
<td>Applied Chemistry</td>
<td>BS</td>
<td>3 1</td>
<td>3</td>
</tr>
<tr>
<td>171ES2T02</td>
<td>Engineering Mechanics</td>
<td>ES</td>
<td>3 1</td>
<td>3</td>
</tr>
<tr>
<td>171CS2T01</td>
<td>Data Structures through C</td>
<td>PC</td>
<td>3 1</td>
<td>3</td>
</tr>
<tr>
<td>171HS2L02</td>
<td>English Communication Skills Lab-II</td>
<td>HSS</td>
<td>--- ---</td>
<td>3 2</td>
</tr>
<tr>
<td>171BS2L03</td>
<td>Applied Chemistry Lab</td>
<td>BS</td>
<td>--- ---</td>
<td>3 2</td>
</tr>
<tr>
<td>171ES2L02</td>
<td>Engineering Workshop &amp; IT Workshop</td>
<td>ES</td>
<td>--- ---</td>
<td>3 2</td>
</tr>
<tr>
<td></td>
<td><strong>TOTAL</strong></td>
<td></td>
<td>17 6 13</td>
<td>23</td>
</tr>
</tbody>
</table>
Introduction
In view of the growing importance of English as a tool for global communication and the consequent emphasis on training the students to acquire communicative competence, the syllabus has been designed to develop linguistic and communicative competence of the students of Engineering.

As far as the detailed Textbooks are concerned, the focus should be on the skills of listening, speaking, reading and writing. The non-detailed Textbooks are meant for extensive reading for pleasure and profit.

Thus the stress in the syllabus is primarily on the development of communicative skills and fostering of ideas.

Methodology
1. The class are to be learner-centred where the learners are to read the texts to get a comprehensive idea of those texts on their own with the help of the peer group and the teacher.
2. Integrated skill development methodology has to be adopted with focus on individual language skills as per the tasks/exercise.
3. The tasks/exercises at the end of each unit should be completed by the learners only and the teacher intervention is permitted as per the complexity of the task/exercise.
4. The teacher is expected to use supplementary material wherever necessary and also generate activities/tasks as per the requirement.
5. The teacher is permitted to use lecture method when a completely new concept is introduced in the class.

The following text books are recommended for study in I B.Tech I Semester (Common for all branches)
Detailed Textbooks

English Essentials, Published by Ravindra Publishing House
Non-Detailed Textbook:
Trail Blazers, Published By Orient Blackswan

The Course Content Along With The Study Material Is Divided Into Five Units.
1. In London: M.K.Gandhi
Objective: To Apprise The Learner How Gandhi Spent A Period Of Three Years In London As A Student.
Outcome: The Learner Will Understand How Gandhi Grew In Introspection And Maturity.
2. The Knowledge Society- Apj Abdul Kalam
Objective: To Make The Learners Rediscover India As A Land Of Knowledge.
Outcome: The Learners Will Achieve A Higher Quality Of Life, Strength And Sovereignty Of A Developed Nation.
3. The Scientific Point Of View- J.B.S. Haldane
Objective: This Essay Discusses How Scientific Point Of View Seeks To Arrive At The Truth Without Being Biased By Emotion.
Outcome: This Develops In The Student The Scientific Attitude To Solve Many Problems Which We Find Difficult To Tackle.
4. Man’s Peril
Objective: To Inform The Learner That All Men Are In Peril.
Outcome: The Learner Will Understand That All Men Can Come Together And Avert The Peril.
5. Luck—Mark Twain
Objective: This is a short story about a man’s public image and his true nature. The theme of the story is that luck can be a factor of life, so that even if one is incompetent but lucky, one can still succeed.
OUTCOME: The story is humorous in that it contains a lot of irony. Thus this develops in the learner understand humorous texts and use of words for irony.

Text Book : ‘English Essentials’ by Ravindra Publications
Non-Detailed Text

(From Modern Trailblazers of Orient Blackswan)
(Common single Text book for one semester)
(Five topics are chosen from the given text)
(Audio should be included)
1. G.D.Naidu
OBJECTIVE: To inspire the learners by G.D.Naidu’s example of inventions and contributions.
OUTCOME: The learner will be in a position to emulate G.D.Naidu and take to practical applications.
2. G.R.Gopinath
OBJECTIVE: To inspire the learners by his example of inventions.
OUTCOME: Like G.R.Gopinath, the learners will be able to achieve much at a low cost and help the common man.
3. J.C. Bose
OBJECTIVE: To apprise of J.C.Bose’s original contributions.
OUTCOME: The learner will be inspired by Bose’s achievements so that he may start his own original work.
4. HomiJehangirBhaba
OBJECTIVE: To show Bhabha as the originator of nuclear experiments in India.
OUTCOME: The learner will be inspired by Bhabha’s achievements so as to make his own experiments.
5. A Shadow- R.K.Narayan
OBJECTIVE: To expose the reader to the pleasure of the humorous Story
OUTCOME: The learner will be in a position to appreciate the art of writing a short story and try his hand at it.

Text Book

‘Trail Blazers’ by Orient Black Swan Pvt. Ltd. Publishers

****
UNIT I: Differential equations of first order and first degree:

Linear differential equations - Bernoulli differential equation - Exact differential equations-Equations reducible to exact.


UNIT II: Linear differential equations of higher order:

Linear differential equations of higher order with constant coefficients with RHS term of the type $e^{ax}$, $\sin ax$, $\cos ax$, polynomials in $x$, $e^{ax} V(x)$, $x V(x)$-Method of Variation of parameters, Method of undetermined coefficients.

*( MATLAB Exercise: Introduction to MATLAB commands and Solution of Initial Value Problems using the command ‘dsolve’ )

Applications: Electric circuits, simple harmonic motion.

UNIT III: Linear systems of equations:


Applications: Finding the current in electrical circuits.

UNIT IV: Eigen values - Eigen vectors and Quadratic forms:

Eigen values - Eigen vectors- Properties of eigen values ( with out proof ) – Cayley-Hamilton theorem ( with out proof ) - Inverse and powers of a matrix by using Cayley-Hamilton theorem- Diagonalization- Quadratic forms-Reduction of quadratic form to canonical form using orthogonal transformation– Nature of the quadratic form.
*(MATLAB Exercise: All Basic Operations on matrices are to be implemented using MATLAB including computation of rank, computation of eigen values and eigen vectors)*

UNIT V: Partial differentiation and Partial differential equations

Homogeneous function-Euler’s theorem-Total derivative-Chain rule-Taylor’s and Maclaurin’s series expansion of functions of two variables– Functional dependence- Jacobian.

Formation of partial differential equations by elimination of arbitrary constants and arbitrary functions –solutions of first order linear (Lagrange) equation, nonlinear (standard types) equations.

Applications: Maxima and Minima of functions of two variables without constraints and Lagrange’s method (with constraints).

*(MATLAB Exercise: To Plot graphs of various single and multivariable functions using MATLAB and analyze their maxima and minima graphically)*

Text Books:

2. Dr.T.K.V. Iyengar, Engineering Mathematics, S. Chand publications

Reference Books:

2. D.G.Zill, MICHAEL R CULLER, Advanced Engineering Mathematics
3. Dean G. Duffy, Advanced engineering mathematics with MATLAB,
   CRC Press
5. Glyn James, Advanced modern engineering mathematics, Pearson
   education
6. MATLAB by Rudra Pratap, Getting started with MATLAB, Oxford
   Publication.

* Not to be examined

****
MATHEMATICS-II
(171BS1T02)

I Semester

<table>
<thead>
<tr>
<th>Unit</th>
<th>L</th>
<th>T</th>
<th>P</th>
<th>C</th>
</tr>
</thead>
<tbody>
<tr>
<td>I</td>
<td>3</td>
<td>1</td>
<td></td>
<td>3</td>
</tr>
</tbody>
</table>

UNIT I: Solution of Algebraic and Transcendental Equations and Interpolation:

UNIT II: Numerical Integration and solution of Ordinary Differential equations:

UNIT III: Fourier Series:
Fourier series of periodic function - Dirichlet’s conditions for fourier expansion - Functions having points of discontinuities - Change of interval – Even and odd functions – Half-range series.

UNIT IV: Fourier Transforms:

UNIT V: Applications of PDE:
Classification of Higher order P.D.E - Method of separation of Variables - Solution of One dimensional Wave equation, Heat equation and two-dimensional Laplace equation.
Text Books:

2. **V.Ravindranath and P.Vijayalakshmi**, Mathematical Methods, Himalaya Publishing House

Reference Books:

1. **Dean G. Duffy**, Advanced engineering mathematics with MATLAB, CRC Press
5. Advance engineering mathematics by **SRK Iyengar**, Alpha Sciences International Publication

****
UNIT-I


UNIT-II

DIFFRACTION: Fraunhofer diffraction at single slit – Cases of double slit, N-slits, & circular aperture, Grating equation – Rayleigh criterion of resolving power- Resolving power of a grating, Telescope and Microscopes

UNIT-III

POLARIZATION: Types of Polarization – Methods of production – Nicol Prism – Quarter wave plate and Half Wave plate- working principle of polarimeter (Sacharimeter).


UNIT-IV


UNIT-V


SEMICONDUCTOR PHYSICS: Conduction – Density of carriers in Intrinsic and Extrinsic semiconductors – Drift & Diffusion – relevance of Einstein’s equation- Hall
effect in semiconductors.

**Text Books**

1. Engineering Physics – by M.N.Aavadhanulu and T.V.S. Arun Murthy, S.Chand & Company Ltd.,

**Reference Books**

   Engineering Physics by M. Arumugam, Anuradha Publication (2014)

****
UNIT-I

INTRODUCTION TO ENGINEERING DRAWING: Lettering, Dimensioning, Types of lines.

GEOMETRICAL CONSTRUCTIONS: Construction of regular polygons by general method and Inscribing circle method. Special Methods for pentagon and hexagon.

CONIC SECTIONS: Ellipse, Parabola and Hyperbola by general method (eccentricity method) and special methods.

SCALES: Plain scale, Diagonal scale and Vernier scales.

UNIT-II

ORTHOGRAPHIC PROJECTIONS: Introduction to Orthographic projections, Projections of points, projections of lines.

UNIT-III

PROJECTIONS OF PLANES: Regular planes perpendicular/parallel to one reference plane and inclined to other reference plane; inclined to both the reference planes.

UNIT-IV

PROJECTIONS OF SOLIDS: Prisms, pyramids, cones and cylinders with the axis parallel to both the reference planes and axis inclined to one of the reference planes.

UNIT-V

ISOMETRIC PROJECTIONS: Isometric scale, Isometric projections Conversion of Isometric projections into Orthographic projections.
Text Books


Reference Books


****
UNIT-I


Introduction to C Programming & Programming Style:
Introduction- Identifiers, The main () Function, The printf () Function
Programming Style – Indentation, Comments, Keywords, Operators, Constants, Data Types, Variables and Declarations, Operator Precedence and Associativity, Assignment – Implicit Type Conversions, Explicit Type Conversions (Casts), Assignment Variations, Formatted Output.

UNIT –II:


Arrays: One-Dimensional Arrays, Array Initialization, Arrays as Function Arguments, Two-Dimensional Arrays, Multi Dimensional Arrays- Matrices

UNIT-III

Modular Programming: Function and Parameter Declarations, Categories of functions , Returning a Value, Functions with Empty Parameter Lists, Variable Scope, Storage Classes, Passing parameters to functions, Storing Addresses.

Case Study: Swapping Values, Recursion – Mathematical Recursion, Recursion versus Iteration.

Strings: String Fundamentals, String Input and Output, String Processing, Library
Functions and without handling functions

UNIT-IV

**Pointers:** Concept of a Pointer, Declaring ,Initialization and using of pointer variables, pointers as function arguments, passing by address, Dangling memory, address arithmetic, pointers to pointers, Dynamic memory management functions, command line arguments.

UNIT-V

**Structures:** Derived types, Structures declaration, Initialization of structures, accessing structures, nested structures, arrays of structures, self referential structures, unions, type-def, e-num, bit-fields.

**Data Files:** Declaring, Opening, and Closing File Streams, Reading from and Writing to Text Files, Random File Access

Text Books

1. Computer Programming, Reema Thareja, OXFORD.
2. Programming in C A - Practial Approach by Ajay Mittal

Reference Books

2. The C programming Language, Dennis Richie and Brian Kernighan, Pearson Education.
ENGLISH COMMUNICATION SKILLS LAB – 1
(171HS1L01)

I Semester

<table>
<thead>
<tr>
<th>L</th>
<th>T</th>
<th>P</th>
<th>C</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>3</td>
<td>2</td>
</tr>
</tbody>
</table>

PRESCRIBED LAB MANUAL FOR SEMESTER 1:

Strengthen your Communication Skills Published by Maruthi Publications

Exercise - 1

A. Greeting, Introducing and taking leave
B. Pure Vowels

Exercise- 2

A. Giving Information and Asking for Information
B. Diphthongs

Exercise- 3

A. Inviting, Accepting and Declining Invitations
B. Consonants

Exercise- 4

A. Commands, Instructions and Requests
B. Accent and Rhythm

Exercise- 5

A. Suggestions and Opinions
B. Intonation

Reference Books

1. English for Professionals by Prof Eliah, B.S Publications, Hyderabad.
2. A Handbook of English for Professionals by Prof Eliah, B.S Publications.
4. Word power made handy, Drshaliniverma, Schand Company
5. Let us hear them speak, Jayashree Mohanraj, Sage texts

****
LIST OF EXPERIMENTS:
(Any 10 of the following listed experiments)

3. Determination of thickness of a spacer using wedge film and parallel interference fringes.
4. Determination of Rigiity modulus of a material- Torsional Pendulum.
7. Verification of laws of vibrations in stretched strings – Sonometer.
9. L- C- R Series Resonance Circuit.
10. Study of I/V Characteristics of Semiconductor diode.
11. I/V characteristics of Zener diode.
13. Magnetic field along the axis of a current carrying coil – Stewart and Gee’s apparatus.
15. Hall Effect in semiconductors.
18. Determination of Young’s modulus by method of single cantilever oscillations.
20. Determination of Planck’s constant using photocell.
22. Polarimeter – Determination of specific rotation of sugar solution
23. Single Slit – Determination of Slit width using laser or Determination of Wavelength of laser

****
Exercise - 1 Introduction to C Programming

1.1) Introduction about Editors – Turbo, vi, Emacs
1.2) C Program to Perform Adding, Subtraction, Multiplication and Division of two numbers From Command line
1.3) Write a C Program to compute Area of a Traingle using Heron's formula.

Exercise - 2 Basic Math

2.1) Write a C Program to Find Whether the Given Year is a Leap Year or not.
2.2) Write a C Program to convert Celsius to Fahrenheit and vice versa.
2.3) Write a C Program to find largest of three numbers using ternary operator.

Exercise - 3 Control Flow - I

3.1) Write a C program to find the roots of a Quadratic Equation.
3.2) Write a C Program to make a simple Calculator to Add, Subtract, Multiply or Divide Using switch…case.

3.3) Scenario - 1 ATM PIN GENERATION:

Aditya purchased a credit card. He has to generate a PIN number to access the ATM and Net banking for which OTP was sent to his registered mobile number. Using this OTP number he has to generate ATM PIN number. After generating PIN number, he can use it for further transaction. Maximum login you can make is 3 times.

Sample Input:
OTP: 6732
If valid
Enter PIN: 8858
Confirm your PIN: 8858
Sample output:
valid/Invalid
PIN generated successfully.
Note: OTP is hard coded.

3.4) Scenario - 2 RESET PASSWORDS:

Sindhuja was using Syndicate Bank’s Online Account. She wanted to pay her bills through Online. But she forget her password. Now she has to reset the password. For resetting the password, she has to select reset option from the Menu.

NOTE: using switch case.
Sample input:
1. Fast withdrawal
3. Balance Enquiry
4. Reset Password
Enter your choice: 4
Sample Output: Reset password: New password: ***** Confirm password: *****

Exercise – 4 Control Flow - II

4.1) Write a C Program to Find Whether the Given Number is
   i) Prime Number
   ii) Armstrong Number
4.2) Write a C program to print Floyd Triangle
4.3) Write a C Program to print Pascal Triangle

Exercise – 5 Control Flow – III

5.1) Write a C program to find the sum of individual digits of a positive integer.
5.2) Write a C program to check whether given number is palindrome or not.
5.3) Write a C program to read two numbers, x and n, and then compute the sum of the geometric progression 1+x+x2+ x3 +…………+xn
5.4) Scenario - 3 Student Attendance report Generation:
    Some of the school staff had failed to maintain the attendance of the students, causing lack of essential records related to students attendance that should be
submitted in a parents meet. The school management has decided to automate the process in order to maintain the attendance of every student effectively. You are asked to write a program to the above scenario and display whether the student is allowed to write the Exam or not.

<table>
<thead>
<tr>
<th>percentage &lt;= 60</th>
<th>detained</th>
</tr>
</thead>
<tbody>
<tr>
<td>&gt; 60 and &lt;= 75</td>
<td>should pay condonation to appear for Exams</td>
</tr>
<tr>
<td>&gt; 75</td>
<td>allowed for Exams</td>
</tr>
</tbody>
</table>

Sample Input:
Enter no of students: 5

**Enter Students Details:**

<table>
<thead>
<tr>
<th>Rno:1</th>
<th>Name: Kalyan</th>
<th>attendance(%) : 67</th>
<th>Should pay condonation to appear for Exams</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rno:2</td>
<td>Name: laxman</td>
<td>attendance(%) : 56</td>
<td></td>
</tr>
<tr>
<td>Rno:3</td>
<td>Name: Yamini</td>
<td>attendance(%) : 79</td>
<td></td>
</tr>
<tr>
<td>Rno:4</td>
<td>Name: Aryan</td>
<td>attendance(%) : 60</td>
<td></td>
</tr>
<tr>
<td>Rno:5</td>
<td>Name: Raghav</td>
<td>attendance(%) : 88</td>
<td></td>
</tr>
</tbody>
</table>

Sample Output:

<table>
<thead>
<tr>
<th>R NO</th>
<th>NAME</th>
<th>ATTENDENCE (%)</th>
<th>REMARKS</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Kalyan</td>
<td>67</td>
<td>Should pay condonation to appear for Exams</td>
</tr>
<tr>
<td>2</td>
<td>Laxman</td>
<td>56</td>
<td>detained</td>
</tr>
<tr>
<td>3</td>
<td>Yamini</td>
<td>79</td>
<td>allowed for Exams</td>
</tr>
<tr>
<td>4</td>
<td>Aryan</td>
<td>60</td>
<td>detained</td>
</tr>
<tr>
<td>5</td>
<td>Raghav</td>
<td>88</td>
<td>allowed for Exams</td>
</tr>
</tbody>
</table>

**Exercise – 6 Arrays**

Demonstration of arrays

6.1) Search - Linear.
6.2) Sorting-Bubble.
6.3) Operations on Matrix.

6.4) Scenario – 4 Celebrity of the Week:

Red FM has launched a program called Celebrity of the week in their channel. Listeners are given a toll free number where they can listen to list of celebrities. Listeners can choose their favourite celebrity from the list and vote for him/her. The votes are validated from Monday to Saturday. The one with highest votes is called as "Celebrity of the Week" and his/her songs are played in the program, which is aired on sundays. Now write a program to find the celebrity of the week.

**Sample Input:**

1. Nagachaithanya
2. Nithin
3. Prabhas
4. Ram
5. Thamanna
6. Samantha
7. Regina
8. Sruthihasan
Enter no of listeners: 10
Enter your favourite: 3
Enter your favourite: 8
Enter your favourite: 4
Enter your favourite: 3
Enter your favourite: 4
Enter your favourite: 2
Enter your favourite: 7
Enter your favourite: 3
Enter your favourite: 1
Enter your favourite: 5
Sample Output:
"Celebrity of the Week" is PRABHAS

Exercise – 7 Functions

7.1) Write a C Program demonstrating of parameter passing in Functions and returning values.

7.2) Write a C Program illustrating Fibonacci, Factorial with Recursion without Recursion

7.3) Scenario – 5 SELF DRIVE RENTAL

Sadiq and his friends are going to Bangalore. But they don’t have a vehicle in Bangalore. For that they go to rental cars to take car for rent. You have find out what is total amount of car’s rent. The car’s rentals and rules are as follows.

i) Minimum booking is 4.

ii) There are 3 types of cars

A) SWIFT
B) SCORPIO
C) INNOVA

iii) There are 3 categories in cars rental

A) LTTE
B) CLASS
C) XL

FOR SWIFT

- In ltte, 5kms are free per one hour and rs.70 per one hour, if they exceed 5km/ph, then rs.12 per km.
- In class, 10kms are free per one hour and rs.90 per one hour, if they exceed 10km/ph, then rs.12 per km.
- In xl, 15kms are free per one hour and rs.110 per one hour, if they exceed 15km/ph, then rs.12 per km.

FOR SCORPIO

- In ltte, 5kms are free per one hour and rs.90 per one hour, if they exceed 5km/ph, then rs.15 per km.
In class, 10kms are free per one hour and Rs. 110 per one hour, if they exceed 10km/ph, then Rs. 15 per km.

In xl, 15kms are free per one hour and Rs. 130 per one hour, if they exceed 15km/ph, then Rs. 15 per km.

FOR INNOVA

In ltte, 5kms are free per one hour and Rs. 110 per one hour, if they exceed 5km/ph, then Rs. 18 per km.

In class, 10kms are free per one hour and Rs. 130 per one hour, if they exceed 10km/ph, then Rs. 18 per km.

In xl, 15kms are free per one hour and Rs. 150 per one hour, if they exceed 15km/ph, then Rs. 18 per km.

SAMPLE INPUT

ENTER NO. OF DAYS AND HOURS FOR CAR: 01 02 (I.E 1 DAY 2 HOURS = 26 HOURS)

1. SWIFT
2. SCORPIO
3. INNOVA
SELECT A CAR: 2
1. LTTE
2. CLASS
3. XL
SELECT RENTEL TYPE: 2
TOTAL KMS COVERED: 300

SAMPLE OUTPUT

<table>
<thead>
<tr>
<th>TOTAL HOURS:</th>
<th>26</th>
</tr>
</thead>
<tbody>
<tr>
<td>CAR NAME:</td>
<td>SCORPIO</td>
</tr>
<tr>
<td>RENTAL TYPE:</td>
<td>CLASS</td>
</tr>
<tr>
<td>AMOUNT:</td>
<td>3380</td>
</tr>
<tr>
<td>EXCEED AMOUNT (40KM * 18):</td>
<td>720</td>
</tr>
<tr>
<td>GRAND TOTAL:</td>
<td>4100</td>
</tr>
</tbody>
</table>
Exercise – 8 Strings

8.1) Implementation of string manipulation operations with library function.
   i) copy
   ii) concatenate
   iii) length
   iv) compare

8.2) Implementation of string manipulation operations without library function.
   i) copy
   ii) concatenate
   iii) length
   iv) compare

8.3) Verify whether the given string is a palindrome or not

8.4) Scenario – 6 Word with Obesity:

Jeeth is a fun loving and active boy. He likes to play with words and numbers. One day Jeeth and his friends attended a seminar, which was conducted in his school. The Seminar was about "Causes of obesity in children and its effects". Jeeth and his friend Ram are not interested in listening to the seminar, so he thought of giving a puzzle to Ram. Jeeth gave some words to Ram and wanted him to find the word with Obesity. Ram was confused and asking your help. Write a program to find the weights of the words and display the word with highest weight (word with obesity).

Sample Input:

Enter no of words: 3
Enter 3 words: apple banana carrot

Sample Output:

a) Word with Obesity is carrot

Exercise – 9 Arrays and Pointers

9.1) Write a C Program to Access Elements of an Array Using Pointer
9.2) Write a C Program to find the sum of numbers with arrays and pointers.
Exercise – 10 Dynamic Memory Allocations

10.1) Write a C program to find sum of n elements entered by user. To perform this program, allocate memory dynamically using malloc () function.
10.2) Write a C program to find sum of n elements entered by user. To perform this program, allocate memory dynamically using calloc () function. Understand the difference between the above two programs

Exercises - 11 Structures

11.1) Write a C Program to Store Information of a book Using Structure
11.2) Write a C Program to Store Information Using Structures with Dynamically Memory Allocation
11.3) Write a C Program to Add Two Complex Numbers by Passing Structure to a Function
11.4) Scenario – 7 Library Management
Shilpa student of PGEC got the Library Card. She want to Lend the books from the Library. The college gave two cards to each and every students. The students can Lend only two books at a time and it has to be returned back after 15 days. If the books are not returned Late fee will be collected for no. of days the books were returned after the due date. Late fee per day is Rs.50/-
Sample Input.
Enter the name of student, Roll No. Branch, Section, Year, DoL,DOR,
Sample output
No. of days returned after the due date = 5
Late fee per day = Rs. 50
Fine paid by the student is 5 * 50 =250.

Exercise -12 Files

12.1) Write a C programming code to open a file and to print it contents on screen.
12.2) Write a C program to copy files
12.3) Write a C program merges two files and stores their contents in another file.
12.4) Scenario – 8 Student Information System Using Files:
Lakshya International school was recently established and having large no of admissions. The school management wanted the Student information to be computerized and wanted to maintain in a simple and in effective manner. You are asked to develop Student Information System using Files to perform the following tasks

1. Add New Student
2. Update Existing Student
3. Delete Existing Student
4. Retrieve A Particular/All Students

**Sample Input**

Choose the task you want to perform:

1. Add
2. Update
3. Delete
4. Retrieve

Your choice: 1

**Enter student details**

Name: Akhil
Age: 5
Class: 1

**Sample Output**

Student details added
Introduction:
In view of the growing importance of English as a tool for global communication and the consequent emphasis on training the students to acquire communicative competence, the syllabus has been designed to develop linguistic and communicative competence of the students of Engineering.
As far as the detailed Textbooks are concerned, the focus should be on the skills of listening, speaking, reading and writing. The non-detailed Textbooks are meant for extensive reading for pleasure and profit.
Thus the stress in the syllabus is primarily on the development of communicative skills and fostering of ideas.

Methodology:
1. The class are to be learner-centred where the learners are to read the texts to get a comprehensive idea of those texts on their own with the help of the peer group and the teacher.
2. Integrated skill development methodology has to be adopted with focus on individual language skills as per the tasks/exercise.
3. The tasks/exercises at the end of each unit should be completed by the learners only and the teacher intervention is permitted as per the complexity of the task/exercise.
4. The teacher is expected to use supplementary material wherever necessary and also generate activities/tasks as per the requirement.
5. The teacher is permitted to use lecture method when a completely new concept is introduced in the class.

Detailed Text

SURE OUTCOMES: English for Engineers and Technologists (Orient Black Swan)

Recommended Topics
1. Technology with a Human Face

OBJECTIVE: To make the learner understand how modern life has been shaped by technology.
OUTCOME: The proposed technology is people’s technology. It serves the human person instead of making him the servant of machines.

2. Climate Change and Human Strategy

OBJECTIVE: To make the learner understand how the unequal heating of earth’s surface by the Sun, an atmospheric circulation pattern is developed and maintained.
OUTCOME: The learner’s understand that climate must be preserved.

3. Emerging Technologies

OBJECTIVE: To introduce the technologies of the 20th century and 21st centuries to the learners.
OUTCOME: The learner will adopt the applications of modern technologies such as nanotechnology.

4. The Secret of Work

OBJECTIVE: In this lesson, Swami Vivekananda highlights the importance of work for any development.
OUTCOME: The students will learn to work hard with devotion and dedication.

5. Work Brings Solace

OBJECTIVE: In this lesson Abdul Kalam highlights the advantage of work.
OUTCOME: The students will understand the advantages of work. They will overcome their personal problems and address themselves to national and other problems.


Non-Detailed Text

PANORAMA- A course on Reading by Oxford University Press Pvt. Ltd. Publishers
1. An Ideal Family

OBJECTIVE: To develop extensive reading skill and comprehension for pleasure and profit.
OUTCOME: Acquisition of writing skills

2. War

OBJECTIVE: To develop extensive reading skill and comprehension for pleasure and profit.
OUTCOME: Acquisition of writing skills

3. The Verger

OBJECTIVE: To develop extensive reading skill and comprehension for pleasure and profit.
OUTCOME: Acquisition of writing skills

4. The Scarecrow

OBJECTIVE: To develop extensive reading skill and comprehension for pleasure and profit.
OUTCOME: Acquisition of writing skills

5. A Village Lost To the Nation

OBJECTIVE: To develop extensive reading skill and comprehension for pleasure and profit.
OUTCOME: Acquisition of writing skills

****
UNIT I: Laplace transforms:

Laplace transforms of standard functions—First Shifting theorem, Change of scale, Multiplication with t, Division by t — Transforms of derivatives and integrals — Unit step function — Dirac’s delta function, Periodic functions.

UNIT II: Inverse Laplace transforms:

Inverse Laplace transforms — Convolution theorem (with out proof), Second shifting theorem.

*(MATLAB Exercise: Computing Laplace transform of f(t) using symbolic toolbox, Solving initial value problems using ‘dsolve’)*

Applications: Evaluating improper integrals, solving initial value problems using Laplace transforms.

UNIT III: Multiple integrals and Beta, Gamma functions:

Multiple integrals: Double and triple integrals — Change of variables — Change of order of integration, Beta and Gamma functions— Properties — Relation between Beta and Gamma functions—

Applications: Finding Areas and Volumes.

UNIT IV: Vector Differentiation:

Gradient - Directional Derivatives - Divergence- Curl - Laplacian operator —Vector identities.

Applications: Equation of continuity, potential surfaces

UNIT V: Vector Integration:

Line integral — Work done - Surface and volume integrals, Green’s Theorem, Stokes Theorem and Gauss Divergence theorem (without proof) and related problems.
Text Books:

2. Dr.T K V Iyengar, Engineering Mathematics, S.Chand Publications.

Reference Books:

* Not to be examined

****
UNIT – I : Ecosystems: Scope of environmental studies, Structure biotic and abiotic factors – Producers, consumers and decomposers,
Function – Food chain, Food web, Tropic structure and Energy flow in the ecosystem

UNIT – II : Natural Resources: Natural resources and associated problems
Forest resources – Use and over – exploitation, deforestation – Timber extraction – Mining, dams and other effects on forest and tribal people
Water resources – Use and over utilization of surface and ground water – Floods, drought, conflicts over water, dams – benefits and problems
Mineral resources: Use and exploitation, environmental effects of extracting and using mineral resources
Food resources: World food problems, changes caused by non-agriculture activities- effects of modern agriculture, fertilizer-pesticide problems, water logging, salinity
Energy resources: Growing energy needs, renewable and non-renewable energy sources, use of alternate energy sources Vs Oil and Natural Gas Extraction.
Land resources: Land as a resource, land degradation, Wasteland reclamation, man induced landslides, soil erosion and desertification. Role of an individual in conservation of natural resources. Equitable use of resources for sustainable lifestyles.


UNIT – IV Environmental Pollution: Definition, Causes, effects and control measures of Air pollution, Water pollution, Soil pollution, Noise pollution, Nuclear hazards. Role of an individual in prevention and control of pollution. - Pollution case studies, Sustainable Life Style.
**Solid Waste Management:** Sources, Classification, effects and control measures of urban and industrial solid wastes. Consumerism and waste products, Biomedical, Hazardous and e– waste management.


**Text Books**

2. Environmental Studies, K.V. S. G. Murali Krishna, VGS Publishers, Vijayawada
4. Environmental Studies, P.N. Palanisamy, P. Manikandan, A. Geetha, and K. Manjula Rani; Pearson Education, Chennai

**References Books**

2. A Textbook of Environmental Studies, Shaashi Chawla, TMH, New Delhi

****
UNIT I

HIGH POLYMERS AND PLASTICS


UNIT II

FUEL TECHNO


UNIT III

ELECTROCHEMICAL CELLS AND CORROSION

Galvanic cells - Reversible and irreversible cells – Single electrode potential- Electro chemical series and uses of this series- Standard electrodes (Hydrogen and Calomel electrodes) - Concentration Cells – Batteries: Dry Cell - Li cells - Zinc – air cells.

Corrosion:- Definition – Theories of Corrosion (electrochemical) – Formation of
galvanic cells by different metals, by concentration cells, by differential aeration and waterline corrosion – Passivity of metals – Pitting corrosion - Galvanic series – Factors which influence the rate of corrosion - Protection from corrosion – Cathodic protection - Protective coatings: – Metallic (cathodic and anodic) coatings - Methods of application on metals (Galvanizing, Tinning, Electroplating, Electroless plating).

UNIT IV

CHEMISTRY OF ADVANCED MATERIALS

Super conductors:-Type –I, Type II – Characteristics and applications
Semi conductors:- Preparation of semiconductors, working of diods and transistors.
Green synthesis:-Principles
Liquid crystals:-Introduction – Types – Applications
Fuel cells:- Introduction - cell representation, H$_2$-O$_2$ fuel cell: Design and working, advantages and Limitations. Types of fuel cells: methanol-oxygen fuel cells.

UNIT V

NON CONVENTIONAL ENERGY SOURCES

Solar Energy: - Introduction, application of solar energy, conversion of solar energy (Thermal conversion & photo conversion) – photovoltaic cell: design, working and its importance Non-conventional energy sources:
(i) Hydropower include setup a hydropower plant (schematic diagram)
(ii) Geothermal energy: Introduction-schematic diagram of a geothermal power plant
(iii) Tidal and wave power: Introduction- Design and working-movement of tides and their effect on sea level.
(iv) Ocean thermal energy: Introduction, closed-cycle, ocean thermal energy conversion (OTEC), open cycle OTEC, hybrid OTEC, schematic diagram and explanation.
(v) Biomass and biofuels
Text Books

1. Engineering Chemistry by Jain and Jain; Dhanpat Rai Publicating Co.
2. A Text books of Engineering Chemistry by Dr. Bharathi Kumara
   Yalamananchali, VGS publications

Reference Books

2. A text book of engineering Chemistry by S. S. Dara; S. Chand & Co Ltd.,
   Latest Edition
4. Text book of Nano-science and nanotechnology by B.S. Murthy, P.
   Shankar and others, University Press, IIM

* * * *
UNIT I

Friction: Introduction, limiting friction and impending motion, coulomb’s laws of dry friction, coefficient of friction, cone of friction

UNIT II


UNIT III

Centroid: Centroids of simple figures (from basic principles) – Centroids of Composite Figures
Centre of Gravity: Centre of gravity of simple body (from basic principles), centre of gravity of composite bodies, Pappus theorems.

UNIT IV

Area moments of Inertia: Definition – Polar Moment of Inertia, Transfer Theorem, Moments of Inertia of Composite Figures
Mass Moment of Inertia: Moment of Inertia of Masses, Transfer Formula for Mass Moments of Inertia, mass moment of inertia of composite bodies.
UNIT – V

Kinematics: Basics of linear motion
Kinetics: Analysis as a Particle and Analysis as a Rigid Body in Translation – Central Force Motion – Equations of Plane Motion – Fixed Axis Rotation

Text Books


References Books


****
UNIT I

**Introduction to Algorithm analysis:** Preliminaries of algorithm, Algorithm analysis and complexity
Data structure- Definition, types of data structures, Recursion and non recursion: Definition, Design Methodology

**Searching:** linear search, binary search.

**Sorting Techniques:** Basic concepts, Sorting by insertion (Insertion sort), selection (heap sort), exchange (bubble sort, quick sort), distribution (radix sort) and merging (merge sort) Algorithms

UNIT II

**Stacks:** Concepts, Array representation of stack, Operations and implementation, Applications of stack, Evaluation of arithmetic expression, Conversion of expression from infix to postfix.

**Queues:** Concepts, Array representation of Queue, Operations and implementation, Applications of Queue.

UNIT III

**Linked Lists:** Introduction, single linked list, representation of a linked list in memory, Operations on a single linked list, applications of single linked list, Advantages and disadvantages of single linked list, Linked Stacks and Queues, Circular linked list, Double linked list

UNIT IV

**TREES:** Representation of Trees, Binary Trees, Properties of Binary Trees, Binary Tree Representations, Binary Tree Traversals (In-Order, Pre-Order, Post-Order); Binary Search Trees: Definition, Operations: insertion, deletion.
UNIT V

GRAPHS: Introduction, Definition, Graph Representation, Elementary Graph Operation, Depth First Search, Breadth First Search, Connected Components, Spanning Trees, Biconnected Components, Minimum Cost Spanning Trees, Kruskal’s Algorithm, Prim’s Algorithm, shortest path algorithms, transitive closure: Single Source/All pairs (Algorithmic Concepts Only, No Programs required)

PRACTICE SESSION:

*Note: practice session is not considered for external evaluation.

1. Write a C program that use both recursive and non recursive functions to perform Linear search for a Key value in a given list.

2. Write a C program that use both recursive and non recursive functions to perform Binary search for a Key value in a given list.

3. Write a C program that implement Bubble sort, Quick sort, Insertion sort, Selection sort, Merge sort, Radix sort to sort a given list of integers in ascending order.

4. Write a C program that implement stack operations, Queue operations using arrays.

5. Write a C program that uses Stack operations to Conversion of infix expression into postfix expression.

6. Write a C program that Creates singly linked list and its operations.

7. Write a C program that implement stack operations, Queue operations using Linked List.

8. Write a recursive and non-recursive C program to traverse a binary tree in preorder, inorder and postorder.

9. Write a C program to Create, insert and delete a node from BST.
**Text Books**

1. Data Structures using C, Reema Thareja, Oxford
2. Data Structures, 2/e, Richard F, Gilberg, Forouzan, Cengage

**Reference Books**

1. Data structures and algorithm analysis in C, 2nd ed, Mark Allen Weiss
3. Data Structures with C, Seymour Lipshutz, TMH

****
ENGLISH COMMUNICATION SKILLS LAB – II  
(171HS2L02)

II Semester  
L  T  P  C  
-  -  3  2  

PRESCRIBED LAB MANUAL: 
Strengthen your Communication Skills Published by Maruthi Publications

Exercise- 1
Body Language

Exercise -2
Dialogues

Exercise- 3
Presentation Skills

Exercise- 4
Group Discussion

Exercise- 5
Interviews and Telephonic Interviews

Exercise- 6
Debats
Reference Books

1. English for Professionals by Prof Eliah, B.S Publications, Hyderabad.
2. A Handbook of English for Professionals by Prof Eliah, B.S Publications.
4. Cornerstone, Developing soft skills, Pearson Education

****
APPLIED CHEMISTRY LAB
(171BS2L03)

II Semester

L    T    P    C
-    -    3    2

Exercise 1:
Introduction to Chemistry laboratory – Molarity, Normality, Primary, secondary standard solutions, Volumetric titrations, Quantitative analysis, Qualitative analysis, etc.

Exercise 2:
Trial experiment - Determination of HCl using standard Na₂CO₃ solution.

Exercise 3:
Preparation of Phenol - Formaldehyde resin (Bakelite).

Exercise 4
Determination of KMnO₄ using standard Oxalic acid solution.

Exercise 5
Determination of ferrous iron using standard K₂Cr₂O₇ solution.

Exercise 6
Preparation of Bio-Diesel.

Exercise 7
Determination of temporary and permanent hardness of water using standard EDTA solution.

Exercise 8
Determination of Copper using standard EDTA solution.

Exercise 9
Determination of Iron by a Colorimetric method using thiocynate as reagent.

Exercise 10
Determination of pH of the given sample solution using pH meter.

Exercise 11
Conduct metric titration between strong acid and strong base.
Exercise 12
Conduct metric titration between strong acid and weak base.

Exercise 13
Potentiometric titration between strong acid and strong base.

Exercise 14
Potentiometric titration between strong acid and weak base.

Exercise 15
Determination of Zinc using standard EDTA solution.

Exercise 16
Determination of Vitamin – C.

Reference Books
ENGINEERING WORKSHOP & IT WORKSHOP
(171ES2L02)

II Semester

<table>
<thead>
<tr>
<th></th>
<th>L</th>
<th>T</th>
<th>P</th>
<th>C</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>-</td>
<td>-</td>
<td>3</td>
<td>2</td>
</tr>
</tbody>
</table>

ENGINEERING WORKSHOP

Carpentry:
1. T-Lap Joint
2. Cross Lap Joint
3. Dovetail Joint
4. Mortise and Tenon Joint

Fitting:
1. Vee Fit
2. Square Fit
3. Half Round Fit
4. Dovetail Fit

Black Smithy:
1. Round rod to Square
2. S-Hook
3. Round Rod to Flat Ring
4. Round Rod to Square headed bolt

House Wiring:
1. Parallel / Series Connection of three bulbs
2. Stair Case wiring
3. Florescent Lamp Fitting
4. Measurement of Earth Resistance

Tin Smithy:
1. Taper Tray
2. Square Box without lid
3. Open Scoop
4. Funnel

Note: At least two exercises to be done from each trade.
IT WORKSHOP

Exercise- 1:
System Assembling, Disassembling and identification of Parts / Peripherals

Exercise- 2:
Operating System Installation-Install Operating Systems like Windows, Linux along with necessary Device Drivers.

Exercise- 3:
MS-Office / Open Office
b. Spread Sheet - organize data, usage of formula, graphs, charts.
c. Power point - features of power point, guidelines for preparing an effective Presentation.
d. Access- creation of database, validate data.

Exercise- 4:
Network Configuration & Software Installation-Configuring TCP/IP, proxy and firewall settings. installing application software, system software & tools.

Exercise- 5:
Internet and World Wide Web-Search Engines, Types of search engines, netiquette, cyber Hygiene.

Exercise- 6:
Trouble Shooting-Hardware trouble shooting, Software trouble shooting.

Exercise- 7:
LATEX - basic formatting, handling equations and images.
**Reference Books**

4. Getting Started with MATLAB: A Quick Introduction for Scientists and Engineers,
5. Scott Mueller’s Upgrading and Repairing PCs, 18/e, Scott. Mueller, QUE, Pearson, 2008
7. Comdex Information Technology course tool kit Vikas Gupta, WILEY Dreamtech.
8. Introduction to Information Technology, ITL Education Solutions limited, Pearson Education.

****