

COURSE STRUCTURE & DETAILED SYLLABUS

ACE - R20

CIVIL ENGINEERING

B. TECH FOUR YEAR DEGREE COURSE STRUCTURE & SYLLABUS

(2020 Batch)

I Year I Semester



ACE

Engineering College

Ankushapur(V), Ghatkesar(M) - 501 301

(An Autonomous Institution, Affiliated to JNTUH, Hyderabad)



ACE
Engineering College
 Ankushapur(V), Ghatkesar(M), Medchal.Dist - 501 301
 (Autonomous)

B.TECH. FOUR YEAR DEGREE COURSE
CIVIL ENGINEERING
COURSE STRUCTURE
I Year I Semester

I Year							I Semester
S.No	Course Type	Course Code	Course Title	Periods Per Week			Credits
				L	T	P	
1	BSC	MA101BS	Mathematics – I	3	1	0	4
2	BSC	PH103BS	Engineering Physics	3	1	0	4
3	ESC	CS103ES	Programming for Problem Solving	3	1	0	4
4	ESC	ME104ES	Engineering Graphics	1	0	4	3
5	BSC	PH106BS	Engineering Physics Lab	0	0	3	1.5
6	ESC	CS106ES	Programming for Problem Solving Lab	0	0	3	1.5
7	MC	MC107ES	Environmental Science	3	0	0	0
8	MC	MC108	Business English	2	0	0	0
			Induction Programme				
Total				15	3	10	18

MA101BS: MATHEMATICS – I

(Linear Algebra and Calculus)

(Common to CE, EEE, ME, ECE, CSE, IT, IOT, AI&ML, DSE)

B.Tech. I Year I Semester								
Course Code	Category	Hours/Week			Credits	Maximum Marks		
		L	T	P		C	CIA	SEE
MA101BS	BSC	3	1	-	4	30	70	100
		Practical Classes: Nil			Total Classes: 60			
Contact Classes: 45	Tutorial Classes: 15							
Prerequisite: Mathematical Knowledge of 12 th / Intermediate level								
Course Objectives: To learn								
<ul style="list-style-type: none"> • Types of matrices and their properties. • Concept of a rank of the matrix and applying this concept to know the consistency and solving the system of linear equations. • Concept of Eigen values and eigenvectors and to reduce the quadratic form to canonical form. • Concept of Sequence. • Concept of nature of the series. • Geometrical approach to the mean value theorems and their application to the mathematical problems • Evaluation of surface areas and volumes of revolutions of curves. • Evaluation of improper integrals using Beta and Gamma functions. • Partial differentiation, concept of total derivative • Finding maxima and minima of function of two and three variables. 								
Course Outcomes: After learning the contents of this paper the student must be able to								
<ul style="list-style-type: none"> • Write the matrix representation of a set of linear equations and to analyse the solution of the system of equations • Find the Eigen values and Eigen vectors • Reduce the quadratic form to canonical form using orthogonal transformations. • Analyse the nature of sequence and series. • Solve the applications on the mean value theorems. • Evaluate the improper integrals using Beta and Gamma functions • Find the extreme values of functions of two variables with/ without constraints. 								
Unit: I			Matrices					
Matrices: Types of Matrices, Symmetric; Hermitian; Skew-symmetric; Skew-Hermitian; orthogonal matrices; Unitary Matrices; rank of a matrix by Echelon form and Normal form, Inverse of Non-singular matrices by Gauss-Jordan method; System of linear equations; solving system of Homogeneous and Non-Homogeneous equations. Gauss elimination method; Gauss Seidel Iteration Method.								
Unit: II			Eigen values and Eigen vectors					
Eigen values and Eigen vectors: Linear Transformation and Orthogonal Transformation: Eigen values and Eigenvectors and their properties: Diagonalization of a matrix; Cayley-Hamilton Theorem (without proof); finding inverse and power of a matrix by Cayley-Hamilton Theorem; Quadratic forms and Nature of the Quadratic Forms; Reduction of Quadratic form to canonical forms by Orthogonal Transformation								
Unit: III			Sequences & Series					

Sequence: Definition of a Sequence, limit; Convergent, Divergent and Oscillatory sequences.
 Series: Convergent, Divergent and Oscillatory Series; Series of positive terms; Comparison test, p-test, D-Alembert's ratio test; Raabe's test; Cauchy's Integral test; Cauchy's root test; logarithmic test. Alternating series:
 Leibnitz test; Alternating Convergent series: Absolute and Conditionally Convergence.

Unit: IV **Calculus**

Mean value theorems: Rolle's theorem, Lagrange's Mean value theorem with their Geometrical Interpretation and applications, Cauchy's Mean value Theorem. Taylor's Series. Applications of definite integrals to evaluate surface areas and volumes of revolutions of curves (Only in Cartesian coordinates), Definition of Improper Integral: Beta and Gamma functions and their applications.

Unit: V **Multivariable calculus (Partial Differentiation and applications)**

Definitions of Limit and continuity. Partial Differentiation; Euler's Theorem; Total derivative; Jacobian; Functional dependence & independence, Maxima and minima of functions of two variables and three variables using method of Lagrange multipliers.

Text Books:

1. B.S. Grewal, Higher Engineering Mathematics, Khanna Publishers, 36th Edition, 2010
2. Erwin kreyszig, Advanced Engineering Mathematics, 9th Edition, John Wiley & Sons, 2006.

Reference Books:

1. N.P. Bali and Manish Goyal, A text book of Engineering Mathematics, Laxmi Publications, Reprint, 2008.
2. Ramana B.V., Higher Engineering Mathematics, Tata McGraw Hill New Delhi, 11th Reprint, 2010.
3. G.B. Thomas and R.L. Finney, Calculus and Analytic geometry, 9th Edition, Pearson, Reprint, 2002.

Web References:

- 1) SWAYAM Online Courses <https://storage.googleapis.com/uniquecourses/online.html>
- 2) Directory of Open Access Journals <https://doaj.org/>
- 3) Springer Open Journals <https://www.springeropen.com/journals>
- 4) UG/PG MOOCs http://ugcmoocs.inflibnet.ac.in/ugcmoocs/moocs_courses.php

E-Text Books:

- 1) National Digital Library: <https://ndl.iitkgp.ac.in/>
- 2) NCERT Text Books <http://ncert.nic.in/textbook/textbook.htm>
- 3) Directory of Open Access Books <https://www.doabooks.org/>

PH103BS: ENGINEERING PHYSICS

B. Tech. I Year I Semester								
Course Code	Category	Hours/Week			Credits	Maximum Marks		
PH 103BS	BS	L	T	P	C	CIA	SEE	Total
		3	1	0		4	30	70
Contact Classes:45	Tutorial Classes:15	Practical Classes: Nil			Total Classes :60			
Prerequisites: Intermediate Level Physics And Mathematics								
COURSE OBJECTIVES: To make the students								
<ol style="list-style-type: none"> 1. Gain knowledge on the mechanism of physical bodies upon the action of forces on them 2. Understand different types of vibrations 3. Learn on the nature, generation & transmission of different types of waves 4. Get familiarized with the optical phenomena like Interference and diffraction 5. Understand the methods of production of lasers & the basic concepts of optical fibers 								
COURSE OUTCOMES: After completion of this course the students will be able to								
<ol style="list-style-type: none"> 1. Apply the fundamental concepts of Mechanics to solve numerical problems 2. Explain the characteristics of different types of vibrations 3. Describe the propagation, transmission and reflection of waves 4. Express the basic idea of interference and diffraction 5. Describe different types of lasers, their characteristics and propagation of light through fibers 								
UNIT 1:	INTRODUCTION TO MECHANICS					No. of Classes: 12		
Transformation of scalars and vectors under Rotation transformation, Forces in Nature, Newton's laws and its completeness in describing particle motion, Form invariance of Newton's second law, Solving Newton's equations of motion in polar coordinates, Problems including constraints and friction, Extension to cylindrical and spherical coordinates								
UNIT2:	HARMONIC OSCILLATIONS					No. of Classes: 12		
Mechanical and electrical simple harmonic oscillators-Damped harmonic oscillator: heavy, critical and light damping, Energy decay in a damped harmonic oscillator- Relaxation time, Quality factor- Mechanical and electrical oscillators, Mechanical and electrical impedances- Steady state motion of forced damped harmonic oscillator, Power absorbed by an oscillator.								
UNIT 3:	WAVES IN ONE DIMENSION					No. of Classes: 12		
Transverse wave on a string- wave equation on a string- Harmonic waves, Reflection and transmission of waves at a boundary-Impedance matching -Standing waves and their Eigen frequencies-Longitudinal waves- wave equation- Acoustic waves and speed of sound, Standing sound waves.								
UNIT4:	WAVE OPTICS					No. of Classes: 12		
Huygens' principle-Superposition of waves- Interference of light by the division of wave front and amplitude -Young's double slit experiment-Newton's rings, Michelson's interferometer- Fraunhofer diffraction from a single slit and circular aperture, Diffraction grating- Grating Spectrum- Rayleigh's criterion- Resolving power.								
UNIT 5:	LASERS AND FIBER OPTICS					No. of Classes: 12		
Lasers: Introduction to interaction of radiation with matter, Coherence, Principle and working of Laser, Population inversion, Pumping, Types of Lasers: Ruby laser, Carbon dioxide (CO ₂) laser, He-Ne laser, Applications of laser. Fiber Optics: Introduction, Optical fiber as a dielectric wave guide, Total internal reflection, Acceptance angle, Acceptance cone and Numerical aperture, Step and Graded index fibers,								

Losses associated with optical fibers, Applications of optical fibers.

TEXT BOOKS:

1. MK Harbola, Vijaykrishna & Madhumohan, "Engineering Physics"- Cengage Learning, 2018.
2. HJ Pain, "The physics of vibrations and waves", Wiley, 2006

REFERENCEBOOKS:

1. IG Main, "Vibrations and waves in physics", 3rd ed., Cambridge University Press, 2018.
2. O Svelto, "Principles of Lasers", Springer Science & Business Media, 2010.
3. MK Verma, "Introduction to Mechanics", Universities Press
4. Ajoy Ghatak, "Optics", McGraw Hill Education, 2012.
5. MK Harbola, "Engineering Mechanics", 2nd ed., Cengage Learning

WEBREFERENCES:

1. <http://link.springer.com/book>
2. <http://www.thphys.physics.ox.ac.uk>
3. <http://www.sciencedirect.com/science>
4. <http://www.e-booksdirectory.com>

E -TEXT BOOKS:

1. <http://www.peaceone.net/basic/Feynman/>
2. <http://physicsdatabase.com/free-physics-books/>
3. <http://www.damtp.cam.ac.uk/user/tong/statphys/sp.pdf>
4. <http://www.freebookcentre.net/Physics/Solid-State-Physics-Books.html>

CS103ES: PROGRAMMING FOR PROBLEM SOLVING

B. Tech. I Year I Semester								
Course Code	Category	Hours/Week			Credits	Maximum Marks		
CS103ES	ESC	L	T	P	C	CIA	SEE	Total
		3	1	0	4	30	70	100
Contact Classes: 45	Tutorial Classes: 15	Practical Classes: Nil			Total Classes: 60			
Prerequisite: Basic knowledge of Computer								
Course Objectives:								
<ul style="list-style-type: none"> To understand the various steps in program development. To learn the syntax and semantics of C programming language. To learn the usage of structured programming approach in solving problems. To learn modular programming approach in programming To understand and learn the concept of derived data types. 								
Course Outcomes:								
<ul style="list-style-type: none"> To write algorithms and to draw flowcharts for solving problems. To convert the algorithms/flowcharts to C programs. To code and test a given logic in C programming language. To decompose a problem into module (functions) and to develop modular reusable code. To use derived data type to write advanced C programs. 								
Unit - 1	COMPUTER FUNDAMENTALS AND INTRODUCTION TO C LANGUAGE							
<p>Introduction to components of a computer system: disks, primary and secondary memory, processor, operating system, compilers, creating, compiling and executing a program etc., Number systems</p> <p>Introduction to Algorithms: steps to solve logical and numerical problems. Representation of Algorithm, Flowchart/Pseudo code with examples, Program design and structured programming.</p> <p>Introduction to C Programming Language: variables (with data types and space requirements), Syntax and Logical Errors in compilation, object and executable code, Operators, expressions and precedence, Expression evaluation, Storage classes (auto, extern, static and register), type conversion,</p> <p>The main method and command line arguments</p> <p>Bitwise operations: Bitwise AND, OR, XOR and NOT operators</p> <p>Conditional Branching and Loops: Writing and evaluation of conditionals and consequent branching with if, if-else, switch-case, ternary operator, go to, Iteration with for, while, do while loops</p> <p>I/O: Simple input and output with scanf and printf, formatted I/O, Introduction to stdin, stdout and stderr.</p>								
Unit - 2	Derived Data Types							

Arrays: one and two dimensional arrays, creating, accessing and manipulating elements of arrays
Strings: Introduction to strings, handling strings as array of characters, basic string functions available in C (strlen, strcat, strcpy, strstr etc.), arrays of strings

Structures: Defining structures, initializing structures, unions, Array of structures

Pointers: Idea of pointers, Defining pointers, Pointers to Arrays and Structures, Use of Pointers in self-referential structures, usage of self referential structures in linked list(no implementation)
Enumeration data type

Unit -3

Files

Preprocessor: Commonly used Preprocessor commands like include, define, undef, if, ifdef, ifndef
Files: Text and Binary files, Creating and Reading and writing text and binary files, Appending data to existing files, Writing and reading structures using binary files, Random access using fseek, ftell and rewind functions.

Unit -4

Functions

Functions: Designing structured programs, Declaring a function, Signature of a function, Parameters and return type of a function, passing parameters to functions, call by value, Passing arrays to functions, passing pointers to functions, idea of call by reference, Some C standard functions and libraries

Recursion: Simple programs, such as Finding Factorial, Fibonacci series etc., Limitations of Recursive functions

Dynamic memory allocation: Allocating and freeing memory, Allocating memory for arrays of different data types

Unit -5

Applications of Arrays & Analysis of algorithms

Algorithms for finding roots of a quadratic equations, finding minimum and maximum numbers of a given set, finding if a number is prime number, etc.

Basic searching in an array of elements (linear and binary search techniques),

Basic algorithms to sort array of elements (Bubble, Insertion, Selection, Quick and Merge sort algorithms)

Stack using Arrays and Queue using Arrays

Basic concept of order of complexity through the example programs

Text Books:

3. Byron Gottfried, Schaum's Outline of Programming with C, McGraw-Hill
4. B.A. Forouzan and R.F. Gilberg C Programming and Data Structures, Cengage Learning, (3rd Edition)

Reference Books:

1. 'C Programming: A Modern Approach (2nd Edition)' by K. N. King
2. Let us c by Yawanth Kanetkar
3. Programming in C, Stephen G. Kochan, Fourth Edition, Pearson Education.
4. Brian W. Kernighan and Dennis M. Ritchie, The C Programming Language, Prentice Hall of India
5. R.G. Dromey, How to solve it by Computer, Pearson (16th Impression)
6. Programming in C, Stephen G. Kochan, Fourth Edition, Pearson Education.
7. Herbert Schildt, C: The Complete Reference, Mc Graw Hill, 4th Edition

Web References:

1. <https://github.com/EbookFoundation/free-programming-books/blob/master/free-programming-books.md#c>
2. https://publications.gbdirect.co.uk//c_book/

E-Text Books:

1. <https://books.goalkicker.com/CBook/>
2. <http://www2.cs.uregina.ca/~hilder/cs833/Other%20Reference%20Materials/The%20C%20Programming%20Language.pdf>
3. <https://www.stormingrobots.com/prod/tutorial/pdf/kingBook-ch1to10.pdf>

ME104ES: ENGINEERING GRAPHICS

B.Tech. I Year I Semester								
Course Code	Category	Hours/Week			Credits	Maximum Marks		
ME104ES	ESC	L	T	P	C	CIA	SEE	Total
				1	0	4	3	30
Contact Classes: 15	Tutorial Classes: 0	Practical Classes: 60			Total Classes: 75			
Prerequisite: NIL								
Course Objectives:								
<ul style="list-style-type: none"> • To provide basic concepts in engineering drawing. • To impart knowledge about standard principles of orthographic projection of objects. • To draw sectional views and pictorial views of solids. 								
Course Outcomes: At the end of the course, the student will be able to:								
<ul style="list-style-type: none"> • Preparing working drawings to communicate the ideas and information. • Read, understand and interpret engineering drawings. 								
Unit: I								
Principles of Engineering Graphics and their Significance, Conic Sections including the Rectangular Hyperbola – General method only. Cycloid, Epicycloid and Hypocycloid, Scales – Plain & Diagonal.								
Unit: II								
Principles of Orthographic Projections – Conventions – Projections of Points and Lines, Projections of Plane regular geometric figures.— Auxiliary Planes.								
Unit: III								
Projections of Regular Solids – Auxiliary Views - Sections or Sectional views of Right Regular Solids – Prism, Cylinder, Pyramid, Cone – Auxiliary views – Sections of Sphere.								
Unit: IV								
Development of Surfaces of Right Regular Solids – Prism, Cylinder, Pyramid and Cone, Intersection of Solids: Intersection of – Prism vs Prism- Cylinder Vs Cylinder.								
Unit: V								
Isometric Projections: Principles of Isometric Projection – Isometric Scale – Isometric Views – Conventions – Isometric Views of Lines, Plane Figures, Simple and Compound Solids – Isometric Projection of objects having non- isometric lines. Isometric Projection of Spherical Parts. Conversion of Isometric Views to Orthographic Views and Vice-versa – Conventions								
Introduction to CAD: (For Internal Evaluation Weightage only)								
Introduction to CAD Software Package Commands.- Free Hand Sketches of 2D- Creation of 2D Sketches by CAD Package.								

Text Books

1. Engineering Drawing N.D.Bhatt/Charotar.
2. Engineering Drawing / N. S. Parthasarathy and VelaMurali/Oxford.

Reference Books

1. Engineering Drawing / Basant Agrawal and McAgrawal/McGrawHill.
2. Engineering Drawing/ M. B. Shah, B.C. Rane/Pearson.
3. Computer Aided Engineering Drawing – K Balaveera Reddy et al –CBSPublishers.

Web References:

- 1.<http://www.ndl.iitkgp.ac.in/>

E-Text Books:

- 1.<http://www.pdfdrive.com/engineering-drawing-books.html>
2. <http://www.examupdates.in/engineering-drawing-text-book/>

PH106BS: ENGINEERING PHYSICS LAB

B.Tech. I Year I Semester								
Course Code	Category	Hours/Week			Credits	Maximum Marks		
PH 106 BS	Core	L	T	P	C	CIA	SEE	Total
		-	-	3	1.5	30	70	100
Contact Classes: Nil	Tutorial Classes: Nil	Practical Classes: 36			Total Classes:36			

Prerequisite: Nil**COURSE OBJECTIVES:****To make the student**

1. To gain knowledge by applying the experimental methods to correlate with the theoretical concepts.
2. To learn the usage of mechanical, electrical, magnetic and optical systems for various measurements.
3. To Apply the analytical techniques to the experimental data
4. To develop communication skills while working in a group

COURSE OUTCOMES:**After completion of this course the student will be able to**

1. Operate different sets of measuring tools like spectrometer, travelling microscope, diffraction grating and techniques, Melde's apparatus, diffraction grating, coupled oscillator, Torsional pendulum, LCR circuit, Fiber optic kit
2. Compute relevant physical quantities from the observed measurements and interpret through graphical methods
3. Compare the experimental results with their theoretical counterparts
4. Demonstrate basic communication skills through working in groups in performing the laboratory experiments and by interpreting the results

List of Experiments:

- 1) Dispersive power of the material of a prism – Spectrometer
 - 2) Determination of wavelengths of white source – Diffraction grating
 - 3) Newton's Rings – Radius of curvature of Plano convex lens
 - 4) Melde's experiment – Transverse and longitudinal modes
 - 5) Coupled Oscillator
 - 6) L-C-R circuit – Resonance & Q-factor
 - 7) Torsional pendulum – Rigidity modulus
 - 8) Laser Diffraction-Determination of Wavelength
 - 9) Calculation of attenuation coefficient of an optical fiber
 - 10) Determination of Numerical aperture of an optical fiber
- (Any eight experiments to be mandatorily performed by the student)**

List of Equipment Required:

Name of the Equipment	Quantity
Spectrometers	: 6
Diffraction Gratings	: 6
Prisms	: 8
Sodium Vapour lamps	: 2
Mercury Vapour Lamps	: 2
Newton's Rings-Sets	: 6

Melde's Apparatus	:	6
Stewart- Gee's Apparatus	:	6
Circular Brass Discs	:	8
Coupled Oscillators	:	6

Text Books:

1. C. L. Arora, "Practical Physics", S. Chand & Co., New Delhi, 3rd Edition, 2012.
2. Vijay Kumar, Dr. T. Radhakrishna, "Practical Physics for Engineering Students", S M Enterprises, 2nd Edition, 2014
- 3 Y. Aparna, K. Venkateswarao, "Engineering Physics Lab Manual", VGS Book links 2010

Reference Books:

1. C.F. Coombs, "Basic Electronic Instrument Handbook", McGraw-Hill Book Co., 1972.
2. C.H. Bernard and C.D. Epp, John Wiley and Sons, "Laboratory Experiments in College Physics" Inc., New York, 1995.

Web References:

1. <https://www.scribd.com/doc/143091652/engineering-physics-lab>
2. https://www3.nd.edu/~wzech/LabManual_0907c.pdf
3. <https://www.morebooks.de/store/gb/book/engineering-physics-lab-manual/isbn/978-3-330-34402>.

CS106ES: PROGRAMMING FOR PROBLEM SOLVING LAB

B.Tech. I Year I Semester								
Course Code	Category	Hours/Week			Credits	Maximum Marks		
CS106ES	ESC	L	T	P	C	CIA	SEE	Total
		0	0	3	1.5	30	70	100
Contact Classes: 0	Tutorial Classes: 0	Practical Classes:45			Total Classes:45			
Prerequisite: Basic Knowledge of Computer								
<p>Course Objectives: The students will learn the following:</p> <ul style="list-style-type: none"> To work with an IDE to create, edit, compile, run and debug programs To analyze the various steps in program development. To develop programs to solve basic problems by understanding basic concepts in C like operators, control statements etc. To develop modular, reusable and readable C Programs using the concepts like functions, arrays etc. To Write programs using the Dynamic Memory Allocation concept. To create, read from and write to text and binary files 								
For all the Programs writing Algorithm and drawing Flow chart is Mandatory.								
<p>List of Experiments:</p> <p>Basic programs</p> <ol style="list-style-type: none"> Write a simple program that prints the results of all the operators available in C (including pre/ post increment , bitwise and/or/not , etc.). Read required operand values from standard input. Write a simple program that converts one given data type to another using auto conversion and casting. Take the values form standard input. Write a program to convert temperature from Fahrenheit to Celsius and vise versa. A building has 10 floors with a floor height of 3 meters each. A ball is dropped from the top of the building. Find the time taken by the ball to reach each floor. (Use the formula $s = ut + (1/2)at^2$ where u and a are the initial velocity in m/sec (= 0) and acceleration in m/sec^2 (= 9.8 m/s^2)). Write a C program to find simple and compound interest. Write a C program to find Gross salary of an Employee. <p>Decision Making statements</p> <ol style="list-style-type: none"> Write a program for fiend the max and min from the three numbers using if-else. 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) Write program that declares Class awarded for a given percentage of marks, where mark <40%= Failed, 40% to <60% = Second class, 60% to <70%=First class, >= 70% = Distinction. Read percentage from standard input. Write a C program to find the roots of a Quadratic equation. Write a C program to find grade of a student using else if ladder. C program to read weekday number and print weekday name using switch. <p>Loop:</p> <ol style="list-style-type: none"> Write a program that prints a multiplication table for a given number and the number of rows 								

in the table. For example, for a number 5 and rows = 3, the output should be:

5 x 1 = 5
 5 x 2 = 10
 5 x 3 = 15

2. Write a C program to print the following patterns:

```

1      *      1      1      * * * *
1 2    **     2 3    2 2    * * *
1 2 3  ***    4 5 6    3 3 3   **
                                4 4 4 4   *
    
```

a. 1
 2 3
 4 5 6
 7 8 9 10

b. 1
 01
 101
 0101
 10101

c. 1
 22
 333
 4444
 55555

d. *

 *

3. Find the sum of the series

- a. $1^2+2^2+3^2+4^2+\dots+N^2$ b. $1/2 - 2/3 + 3/4 - 4/5 + 5/6 \dots n$
 c. $1-X^2/2!+X^4/4!-\dots$ d. $1-x/2 +x^2/4-x^3/6 \dots$

Loop with Decision making Statements:

1. Write a program that shows the binary equivalent of a given positive number between 0 to 255.
2. Write a program that finds if a given number is a prime number
3. Write a C program to find the sum of individual digits of a positive integer and test given number is palindrome.
4. 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.
5. Write a C program to generate all the prime numbers between 1 and n, where n is a value supplied by the user.
6. Write a C program to read in two numbers, x and n, and then compute the sum of this geometric progression: $1+x+x^2+x^3+\dots+x^n$. For example: if n is 3 and x is 5, then the program computes $1+5+25+125$.
7. Write a C program to print all Perfect numbers between 1 to n.
8. C program to print all Armstrong numbers from 1 to N.

Function

1. Write a C program to calculate factorial of a given number using function & recursion.
2. Write a C Program for call by value & call by reference.
3. Write a C program to calculate GCD of two number using function & recursion.

4. Write a C program to calculate LCM of two number using function & recursion.
5. Write a C program to find x^n using recursion.
6. Write a C program o find minimum and maximum value from given two values using a macro.
7. Write a C program to demonstrate the storage classes.
8. Write a C program to demonstrate pre processor commands.

Arrays

1. Write a C program to find the minimum, maximum and average in an array of integers.
2. Write a functions to compute mean, variance, Standard Deviation, sorting of n elements in single dimension array.
3. Write a C program that uses functions to perform the following:
 - i. Addition of Two Matrices
 - ii. Multiplication of Two Matrices
4. Write a C program to merge to arrays into a single array.
5. Write a C program to implement Stack using array.
6. Write a C program to implement Queue using array.

Sorting and Searching:

1. Write a C program that uses non recursive function to search for a Key value in a given list of integers using linear search method.
2. 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 method.
3. Write a C program that implements the Bubble sort method to sort a given list of integers in ascending order.
4. Write a C program that sorts the given array of integers using selection sort in descending order
5. Write a C program that sorts the given array of integers using insertion sort in ascending order
6. Write a C program that sorts the given array of integers using merge sort and quick sort in ascending order

Pointers & Dynamic Memory Allocation

1. Transpose of a matrix with memory dynamically allocated for the new matrix as row and column counts may not be same.
2. Write a program for reading elements using pointer into array and display the values using array.
3. Write a program for display values reverse order from array using pointer.
4. Write a program through pointer variable to sum of n elements from array.

Strings:

1. Write a C program to convert a Roman numeral ranging from I to L to its decimal equivalent.
2. Write a C program that converts a number ranging from 1 to 50 to Roman equivalent
3. Write a C program that uses functions to perform the following operations:
 - a. To insert a sub-string in to a given main string from a given position.
 - b. To delete n Characters from a given position in a given string.
4. Write a C program to determine if the given string is a palindrome or not (Spelled same in

both directions with or without a meaning like madam, civic, noon, abcba, etc.)

5. Write a C program that displays the position of a character ch in the string S or – 1 if S doesn't contain ch.
6. Write a C program to count the lines, words and characters in a given text.
7. Write a C program that sorts a given array of names

Structures

1. Define a structure for Student with Sno, Sname, marks of three subjects, avg. Write a C program to read 4 students information and display grade of the student.
2. Define a structure called books with book name, author, price, pages, and edition. Write a C program to read and display a book information using pointer.
3. Define a structure for complex number. Write functions on complex numbers (addition, subtraction, multiplication, division, complex conjugate) and implement them in a menu driven style.

Files:

1. Write a C program to display the contents of a file to standard output device.
2. Write a C program which copies one file to another, replacing all lowercase characters with their uppercase equivalents.
3. Write a C program to count the number of times a character occurs in a text file. The file name and the character are supplied as command line arguments.
4. Write a C program that does the following:
It should first create a binary file and store 10 integers, where the file name and 10 values are given in the command line. (hint: convert the strings using atoi function) Now the program asks for an index and a value from the user and the value at that index should be changed to the new value in the file. (hint: use fseek function) The program should then read all 10 values and print them back.
5. 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).
6. Write a C program to display first n characters of a file in reverse order.

List of Equipment/Software (with Specifications or Range) Required:

A Computer System with Ubuntu operating system and GCC Compiler

References

1. Byron Gottfried, Schaum's Outline of Programming with C, McGraw-Hill
2. B.A. Forouzan and R.F. Gilberg C Programming and Data Structures, Cengage Learning, (3rd Edition)
3. Brian W. Kernighan and Dennis M. Ritchie, The C Programming Language, Prentice
4. Hall of India
5. R.G. Dromey, How to solve it by Computer, Pearson (16th Impression)
6. Programming in C, Stephen G. Kochan, Fourth Edition, Pearson Education.
7. Herbert Schildt, C: The Complete Reference, Mc Graw Hill, 4th Edition

MC107ES: ENVIRONMENTAL SCIENCE

B.Tech. I Year I Semester								
Course Code	Category	Hours/Week			Credits	Maximum Marks		
MC107ES	MC	L	T	P	C	CIA	SEE	Total
		3	-	-	0	30	70	100
Contact Classes: 45	Tutorial Classes: Nil	Practical Classes: Nil			Total Classes: 45			
Prerequisite: Nil								
Course Objectives: <ul style="list-style-type: none"> • Understanding the importance of ecological balance for sustainable development. • Understanding the impacts of developmental activities and mitigation measures. • Understanding the environmental policies and regulations 								
Course Outcomes: <ul style="list-style-type: none"> • Based on this course, the Engineering graduate will understand /evaluate / develop technologies on the basis of ecological principles and environmental regulations which in turn helps in sustainable development 								
Unit-1	Ecosystems							
Ecosystems: Definition, Scope, and Importance of ecosystem. Classification, structure, and function of an ecosystem, Food chains, food webs, and ecological pyramids. Flow of energy, Biogeochemical cycles, Bioaccumulation, Bio magnification, ecosystem value, services and carrying capacity, Field visits.								
Unit-2	Natural Resources & Energy resources							
Natural Resources: Classification of Resources: Living and Non-Living resources, water resources: use and over utilization of surface and ground water, floods and droughts, Dams: benefits and problems. Mineral resources: use and exploitation, environmental effects of extracting and using mineral resources, Land resources: Forest resources, Energy resources: growing energy needs, renewable and non renewable energy sources, use of alternate energy source, case studies.								
Unit-3	Biodiversity And Biotic Resources							
Biodiversity And Biotic Resources: Introduction, Definition, genetic, species and eco system diversity. Value of biodiversity; consumptive use, productive use, social, ethical, aesthetic and optional values. India as a mega diversity nation, Hot spots of biodiversity. Field visit. Threats to biodiversity: habitat loss, poaching of wildlife, man-wildlife conflicts; conservation of biodiversity: In-Situ and Ex-situ conservation. National Biodiversity act.								
Unit-4	Environmental Pollution and Control Technologies							
Environmental Pollution and Control Technologies: Environmental Pollution: Classification of pollution, Air Pollution: Primary and secondary pollutants, Automobile and Industrial pollution, Ambient air quality standards. Water pollution: Sources and types of pollution, drinking water quality standards. Soil Pollution: Sources and types, Impacts of modern agriculture, degradation of soil. Noise Pollution: Sources and Health hazards, standards, Solid waste: Municipal Solid Waste management, composition and characteristics of e-Waste								

and its management.

Pollution control technologies: Wastewater Treatment methods: Primary, secondary and Tertiary. Overview of air pollution control technologies, Concepts of bioremediation.

Global Environmental Issues and Global Efforts: Climate change and impacts on human environment. Ozone depletion and Ozone depleting substances (ODS). Deforestation and desertification. International conventions / Protocols: Earth summit, Kyoto protocol, and Montréal Protocol. NAPCC-GoI Initiatives.

Unit-5	Environmental Policy, Legislation & EIA
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Environmental Policy, Legislation & EIA: Environmental Protection act, Legal aspects Air Act- 1981, Water Act, Forest Act, Wild life Act, Municipal solid waste management and handling rules, biomedical waste management and handling rules, hazardous waste management and handling rules. EIA: EIA structure, methods of baseline data acquisition. Overview on Impacts of air, water, biological and Socio-economical aspects. Strategies for risk assessment, Concepts of Environmental Management Plan (EMP).

Towards Sustainable Future: Concept of Sustainable Development Goals, Population and its explosion, Crazy Consumerism, Environmental Education, Urban Sprawl, Human health, Environmental Ethics, Concept of Green Building, Ecological Foot Print, Life Cycle assessment (LCA), Low carbon life style.

Text Books:

- 1 Textbook of Environmental Studies for Undergraduate Courses by ErachBharuchafor University Grants Commission.
- 2 Environmental Studies by R. Rajagopalan, Oxford University Press.

Reference Books:

1. Environmental Science: towards a sustainable future by Richard T. Wright. 2008 PHL Learning Private Ltd. New Delhi.
 2. Environmental Engineering and science by Gilbert M. Masters and Wendell P. Ela.2008 PHI Learning Pvt. Ltd.
 3. Environmental Science by Daniel B. Botkin & Edward A. Keller, Wiley INDIA edition.
 4. Environmental Studies by Anubha Kaushik, 4th Edition, New age international publishers.
 5. Text book of Environmental Science and Technology - Dr. M. Anji Reddy 2007, BS Publications.
- Introduction to Environmental Science by Y. Anjaneyulu, BS. Publications.

Web References:

- 1.Fundamental concepts in Environmental Studies by Dr.D.D Mishra
- 2.Basis of Environmental Science by Micheal Allaby

E-Text Books:

- 1.[ebook] A Text Book of environmental studies by Shashi Chawla - Meripustak.com
2. [ebook] A Text Book of environmental studies by Dr.D.K.Asthana <https://books.google.co.in>

MC108: BUSINESS ENGLISH

Course Code	Category	Hours/Week			Credits	Maximum Marks		
		L	T	P	C	CIA	SEE	Total
MC108/208	MC	2	0	0	2	30	70	100
Contact Classes: 30	Tutorial Classes: -	Practical Classes: Nil			Total Classes: 30			

Prerequisite: Knowledge of functional English, basics in grammar, understanding of LSRW Skills

Course Objectives:

The course aims to illustrate the significance of communication in professional life and emphasize the need for continuous learning in the context of globalization.

Course Outcomes:

Students should be able to

1. Use English Language effectively in spoken and written forms.
2. Comprehend the given texts and respond appropriately in formal and informal situations.
3. Communicate confidently in various contexts and different cultures.
4. Acquire basic proficiency in English including reading and listening comprehension, writing and speaking skills to perform effectively in personal and professional contexts.

Unit-I**COMMUNICATION**

Reading: Goal of Reading, General Strategies for Reading Comprehension, Previewing, Predicting, Identifying the main Idea, Questioning, Making Inferences, Visualizing

Listening: A conversation on phone, Listening to a travel anecdote

Writing: Filling in an application form, Writing emails

Speaking: Breaking the Ice, JAM sessions

Vocabulary: Word Formation :Homophones, Homonyms, Homographs

Unit-II**DEVELOPMENT AND TRAINING**

Reading: Reading between the Lines, Reading and answering a quiz

Listening: Listening to an Interview on Radio, A conversation between colleagues

Writing: Letters- responding to an invitation, letter of enquiry, letter of apology

Speaking: Role Play: How to make decisions, Giving the summary of an article, Descriptions

Vocabulary: Synonyms and Antonyms, One-word substitutes

Unit-III**CORPORATE CULTURE**

Reading: Reading beyond the lines, An article on the power of customers' opinions online

Listening: Working in Teams, Talking about Meetings

Writing: A memo asking for suggestions, Minutes of the meetings

Speaking: Discussion- How to make work place more ecofriendly?

Vocabulary: Technical or business vocabulary, emails and website terms

Unit-IV | **BEING PERSUASIVE**

Reading: Reading for Negative Facts, The art of agreeing and disagreeing

Listening: What makes people persuasive, People negotiating a sale at a trade fair

Writing: A survey report, Completing a business report

Speaking: Things that are important when making a presentation, short presentations

Vocabulary: Cohesive Devices or Linkers, Collocations

Unit-V | **THINKING GLOBALLY**

Reading: Thinking outside the box, Reading and comparing two articles, Ways of using social media

Listening: Thinking Globally, Social Media and Customers, Netiquette

Writing: Mail for a Job application

Speaking: How to use social media for your professional enhancement

Vocabulary: Avoiding Clichés, Idioms and Phrases

Reference Books:

1. New International Business English Updated Edition Workbook, Cambridge University Press.
2. Swan, M. (2016). Practical English Usage. Oxford University Press.
3. Kumar, S and Lata, P.(2018). Communication Skills. Oxford University Press.
4. Wood, F.T. (2007).Remedial English Grammar. Macmillan.
5. Zinsser, William. (2001). On Writing Well. Harper Resource Book.
6. Hamp-Lyons, L. (2006).Study Writing. Cambridge University Press.
7. Exercises in Spoken English. Parts I –III. CIEFL, Hyderabad. Oxford University Press.

Web References:

1. elt.oup.com/learningresources
2. www.cambridgeenglishonline.org
3. www.eslcafe.com
4. bbc.co.uk/worldservice/learningenglish
5. www.manythings.org

E-Text Books:

1. The secret to perfecting your grammar - Bloomsbury International