ACE EngineeringCollege

Ankushapur(V), Ghatkesar(M), R.R.Dist - 501 301

(An Autonomous Institution)

B.TECH. REGULAR COURSE (I-I)

DEPARTMENT OF COMPUTER SCIENCE & ENGINEERING (IoT)

COURSE STRUCTURE

IYear				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	PH102BS	Applied 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	PH105BS	Applied 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)

B.Tech. I Year I Semester								
Course Code	**Category**	**Hours/Week**			**Credits**	**Maximum Marks**		
		L	**T**	**P**	**C**	**CIA**	**SEE**	**Total**
MA101BS	**BSC**	3	1	-	4	30	70	100
Contact Classes: 45	**Tutorial Classes: 15**	**Practical Classes: Nil**				**Total Classes: 60**		

Prerequisite: Mathematical Knowledge of 12th / Intermediate level

Course Objectives: To learn

- Types of matrices and theirproperties.
- Concept of a rank of the matrix and applying this concept to know the consistency and solving the system of linearequations.
- Concept of Eigen values and eigenvectors and to reduce the quadratic form to canonicalform.
- Concept ofSequence.
- Concept of nature of theseries.
- Geometrical approach to the mean value theorems and their application to the mathematicalproblems
- Evaluation of surface areas and volumes of revolutions ofcurves.
- Evaluation of improper integrals using Beta and Gammafunctions.
- Partial differentiation, concept of totalderivative
- Finding maxima and minima of function of two and threevariables.

Course Outcomes: After learning the contents of this paper the student must be able to

- 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 orthogonaltransformations.
- Analyse the nature of sequence andseries.
- Solve the applications on the mean valuetheorems.
- Evaluate the improper integrals using Beta and Gammafunctions
- Find the extreme values of functions of two variables with/ withoutconstraints.

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; Totalderivative; 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, 11thReprint,2010.
3. G.B. Thomas and R.L. Finney, Calculus and Analytic geometry, 9thEdition,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/

PH102BS: APPLIED PHYSICS

B. TECH- I YEAR I SEMESTER

Course Code	Category	Hours/Week			Credits	Maximum Marks		
		L	T	P	C	CIA	SEE	TOTAL
PH102 BS	BSC	3	1	0	4	30	70	100
CONTACT CLASSES:45	TUTORIAL CLASSES:15	PRACTICAL CLASSES: NIL				TOTAL CLASSES :60		

PREREQUISITES: Intermediate level Physics and Mathematics

COURSE OBJECTIVES

To make the student

1. Understand the basic concepts of Quantum Physics
2. Learn the basics of semiconductors and operation of devices PN Diode, Zener Diode, BJT.
3. Understand basics of direct band gap semiconductors and operation of Opto-Electronic devices.
4. Gain knowledge on different ways of production of lasers and the basics of fiber optics
5. Get familiarized with the nature of different dielectric and magnetic materials and electromagnetic theory

COURSE OUTCOMES:

After completion of this course the student will be able to

1. Explain the wave-particle duality of both radiation and matter
2. Explain the different types of semi-conductors and the operation & characteristics of PN Diode, Zener diode and BJT
3. Describe the operation & characteristics of Opto- Electronic devices
4. Illustrate the features of a laser beam and its applications and explain fiber optic communication
5. Classify various dielectric and magnetic materials and explain the basics of electromagnetic theory

UNIT 1: QUANTUM MECHANICS

Introduction to quantum physics, de-Broglie's hypothesis, Wave-particle duality, Davisson-Germer experiment, Heisenberg's Uncertainty principle, Born's interpretation of the wave function, Schrodinger's time independent wave equation, Particle in one dimensional box, Bloch's Theorem-Electron motion in a periodic potential- Kronig-Penney Model-Effective Mass-Origin of Energy Bands in solids-Classification of materials into conductors, semiconductors and insulators.

UNIT 2: SEMICONDUCTOR PHYSICS

Intrinsic and Extrinsic semiconductors, Dependence of Fermi level on carrier-concentration and temperature, Carrier generation and recombination, Carrier transport: diffusion and drift, Hall effect, p-n junction diode, Zener diode and their V-I Characteristics, Bipolar Junction Transistor (BJT): Construction, Principle of operation.

UNIT 3: OPTOELECTRONICS

Radiative and non-radiative recombination mechanisms in semiconductors, LED and semiconductor lasers: Device structure, Materials, Characteristics and figures of merit, Semiconductor photodetectors: Solar cell, PIN and Avalanche and their structure, Materials, working principle and Characteristics.

UNIT 4: LASERS AND FIBER OPTICS

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

UNIT 5: ELECTROMAGNETISM & MAGNETIC PROPERTIES OF MATERIALS

Laws of electrostatics, Electric current and the continuity equation, Ampere's and Faraday's laws, Maxwell's equations, Polarization, Permittivity and Dielectric constant, Internal fields in a solid, Clausius-Mosotti equation, Ferroelectrics and Piezoelectric materials. Magnetization, permeability and susceptibility, Classification of magnetic materials, Ferromagnetism and ferromagnetic domains, Hysteresis, Applications of magnetic materials

Text Books:

1. Engineering Physics, B.K. Pandey, S. Chaturvedi - Cengage Learning
2. Integrated Electronics by J. Millman and C. Halkias, TMH

Reference Books:

1. Richard Robinett, "Quantum Mechanics" 2nd ed. -Oxford.
2. J. Singh, Semiconductor Optoelectronics: Physics and Technology, MGH (1995).
3. Halliday and Resnick, Physics - Wiley.
4. A textbook of Engineering Physics, Dr. M. N. Avadhanulu, Dr. P.G. Kshirsagar - S. Chand

Web References:

1. web.mit.edu/6.732
2. https://learn about-electronics.org/semiconductors
3. www. Aip.org/history/Heisenberg/p08.html
4. https://www.youtube.com/watch?v=wpAA3qeOYiI
5. https://www.youtube.com/watch?v=OyC02DWq3mI
6. https://www.youtube.com/watch?v=KFCgeI4j-Ig
7. http://www.infocobuild.com/education/audio-video-courses/materials-science/optoelectronic-materials-and-devices-iit-kanpur.html#:~:text=Instructors%3A%20Prof.-,Deepak%20Gupta%20and%20Prof.,in%20optoelectronics%20and%20semiconductor%20devices.
8. https://circuitglobe.com/light-emitting-diode-led.html
9. https://solarlove.org/how-solar-cells-work-components-operation-of-solar-cells/

E-Text Books:

1. https://www.e-booksdirectory.com/details.php?ebook=11931
2. https://www.e-booksdirectory.com/details.php?ebook=5855
3. https://www.e-booksdirectory.com/details.php?ebook=5302

CS203ES: PROGRAMMING FOR PROBLEM SOLVING

B. Tech I Year I Semester

Course Code	Category	Hours/Week			Credits	Maximum Marks		
		L	T	P	C	CIA	SEE	Total
CS103ES	ESC	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:

- To understand the various steps in programdevelopment.
- To learn the syntax and semantics of C programminglanguage.
- To learn the usage of structured programming approach in solvingproblems.
- To learn modular programming approach inprogramming
- To understand and learn the concept of derived datatypes.

Course Outcomes:

- To write algorithms and to draw flowcharts for solvingproblems.
- To convert the algorithms/flowcharts to Cprograms.
- To code and test a given logic in C programminglanguage.
- To decompose a problem into module (functions) and to develop modular reusablecode.
- To use derived data type to write advances Cprograms.

Unit - 1 COMPUTER FUNDAMENTALS AND INTRODUCTION TO C LANGUAGE

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

Introduction to Algorithms: steps to solve logical and numerical problems. Representation of Algorithm, Flowchart/Pseudo code with examples, Program design and structured programming **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,

The main method and command line arguments

Bitwise operations: Bitwise AND, OR, XOR and NOT operators

Conditional Branching and Loops: Writing and evaluation of conditionals and consequent branching with if, if-else, switch-case, ternary operator, goto, Iteration with for, while, dowhile loops

I/O: Simple input and output with scanf and printf, formatted I/O, Introduction to stdin, stdout and stderr.

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, (3rdEdition)

Reference Books:

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

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		
		L	T	P	C	CIA	SEE	Total
ME104ES	ESC	1	0	4	3	30	70	100
Contact Classes: 15	Tutorial Classes: 0	Practical Classes: 60				Total Classes: 75		

Prerequisite: NIL

Course Objectives:

- To provide basic concepts in engineeringdrawing.
- To impart knowledge about standard principles of orthographic projection ofobjects.
- To draw sectional views and pictorial views ofsolids.

Course Outcomes: At the end of the course, the student will be able to:

- Preparing working drawings to communicate the ideas andinformation.
- Read, understand and interpret engineeringdrawings.

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/

PH105BS : APPLIED PHYSICS LAB

B. TECH- I YEAR I SEMESTER

Course code	Category	Hours/week			Credits	Maximum Marks		
		L	T	P	C	CIA	SEE	Total
PH 105BS	BS	-	-	3	1.5	30	70	100
Contact Classes: Nil	Tutorial Classes: Nil	Practical Classes: 39				Total Classes:39		

Prerequisites: none

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 electric, electronic, 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 RC circuit, LCR circuit, Laser diode and LED characteristics, Energy gap, Stewart-Gee's apparatus, Hall effect, Photoelectric effect and solar cell circuits
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) Charging, discharging and time constant of an R-C circuit
2) L-C-R circuit – Resonance & Q-factor
3) Magnetic field along the axis of current carrying coil – Stewart and Gees method
4) Study the characteristics of a LED
5) Study the characteristics of a LASER diode
6) Bending losses of fibres & Evaluation of numerical aperture of a given fibre
7) Energy gap of a material of p-n junction
8) Hall Effect- Determination of Hall Coefficient
9) Solar Cell-I-V Characteristics and Fill Factor
10) Photoelectric Effect- Determination of Planck's Constant

(Any eight experiments to be mandatorily performed by the student)

List of Equipment Required:

Function Generators
Battery Eliminators
Ammeters
Rheostats
LCR Circuit Boards
R-C Circuit Boards
Laser Characteristics-Circuit Boards
LED characteristics Boards

Energy Gap Kits
Optical Fiber Kits
Hall Effect circuit Boards
Photoelectric effect circuit Boards

CS206ES : PROGRAMMING FOR PROBLEM SOLVING LAB

B.Tech. I Year I Semester

Course Code	Category	Hours/Week			Credits	Maximum Marks		
		L	T	P	C	CIA	SEE	Total
CS206ES	ESC	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

Course Objectives: The students will learn the following:

- 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.

List of Experiments:

Basic programs

1. 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.
2. Write a simple program that converts one given data type to another using auto conversion and casting. Take the values form standard input.
3. Write a program to convert temperature from Fahrenheit to Celsius and vise versa.
4. 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)).
5. Write a C program to find simple and compound interest.
6. Write a C program to find Gross salary of an Employee.

Decision Making statements

1. Write a program for fiend the max and min from the three numbers using if-else.
2. 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)
3. 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.
4. Write a C program to find the roots of a Quadratic equation.
5. Write a C program to find grade of a student using else if ladder.
6. C program to read weekday number and print weekday name using switch.

Loop:

1. 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+……+N^2
   b. 1/2 - 2/3 + 3/4 - 4/5 + 5/6……n
   c. 1-X^2/2!+X^4/4!- ……..
   d. 1-x/2 +x^2/4-x^3/6 ……

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+……+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 firs t 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**		
		L	**T**	**P**	**C**	**CIA**	**SEE**	**Total**
MC107ES	**MC**	3	-	-	0	30	70	100
Contact Classes: 45	**Tutorial Classes: Nil**	**Practical Classes: Nil**				**Total Classes: 45**		

Prerequisite: Nil

Course Objectives:

- 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:

- Based on this course, the Engineering graduate will understand /evaluate / developtechnologies on the basis of ecological principles and environmental regulationswhich in turn helps in sustainable development

Unit-1 Ecosystems

Ecosystems: Definition, Scope, and Importance of ecosystem. Classification, structure, andfunction of an ecosystem, Food chains, food webs, and ecological pyramids. Flow of energy,Biogeochemical cycles, Bioaccumulation, Biomagnification, ecosystem value, services andcarrying capacity, Field visits.

Unit-2 Natural Resources&Energyresources

Natural Resources: Classification of Resources: Living and Non-Living resources, **waterresources:** use and over utilization of surface and ground water, floods and droughts, Dams:benefits and problems. **Mineral resources:** use and exploitation, environmental effects ofextracting and using mineral resources, **Land resources:** Forest resources, **Energyresources:** growing energy needs, renewable and non renewable energy sources, use ofalternate energy source, case studies.

Unit-3 Biodiversity And Biotic Resources

Biodiversity And Biotic Resources: Introduction, Definition, genetic, species and ecosystemdiversity. Value of biodiversity; consumptive use, productive use, social, ethical, aestheticand 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 andIndustrial pollution, Ambient air quality standards. **Water pollution:** Sources and types ofpollution, drinking water quality standards. **Soil Pollution:** Sources and types, Impacts ofmodern agriculture, degradation of soil. **Noise Pollution:** Sources and Health hazards,standards, **Solid waste:** Municipal Solid Waste management, composition and characteristicsof e-Waste and its management.
Pollution control technologies: Wastewater Treatmentmethods: Primary, secondary and Tertiary.Overview of air pollution control technologies, Concepts of bioremediation.
GlobalEnvironmental Issues and Global Efforts: Climate change and impacts on human environment. Ozone depletion and Ozone depleting substances (ODS). Deforestation anddesertification. International conventions / Protocols: Earth summit, Kyoto protocol, andMontréal Protocol. NAPCC-GoI Initiatives.

Unit-5 Environmental Policy, Legislation & EIA

Environmental Policy, Legislation & EIA: Environmental Protection act, Legal aspectsAir Act- 1981, Water Act, Forest Act, Wild life Act, Municipal solid waste management andhandling rules, biomedical waste management and handling rules, hazardous wastemanagement and handling rules. EIA: EIA structure, methods of baseline data acquisition.Overview on Impacts of air, water, biological and Socio-economical aspects. Strategies forrisk

assessment, Concepts of Environmental Management Plan (EMP).
TowardsSustainable Future: Concept of Sustainable Development Goals, Population and itsexplosion, Crazy Consumerism, Environmental Education, Urban Sprawl, Human health,Environmental Ethics, Concept of Green Building, Ecological Foot Print, Life Cycleassessment (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 PHLLearning 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 INDIAedition.
4. Environmental Studies by Anubha Kaushik, 4th Edition, New age internationalpublishers.
5. Text book of Environmental Science and Technology - Dr. M. Anji Reddy 2007, BSPublications.

Introduction to Environmental Science by Y. Anjaneyulu, BS.Publications.

Web References:

1.Fundamental concepts in Environmental Studies by Dr.D.DMishra
2.Basis of Environmental Science by MichealAllaby

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

B.Tech. I Year I Semester

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.