ACE

ENGINEERING COLLEGE

Ankushapur, Ghatkesar – 501 301

(Autonomous)

B.TECH. FOUR YEAR DEGREE COURSE

ELECTRICAL AND ELECTRONICS ENGINEERING

COURSE STRUCTURE

ACE R20

I Year				II Semester			
S.No.	Course type	Course Code	Course Title	Periods per week			Credits
				L	T	P	
1	BSC	MA201BS	Mathematics – II	3	1	0	4
2	BSC	PH202BS	Applied Physics	3	1	0	4
3	ESC	CS203ES	Programming for Problem Solving	3	1	0	4
4	ESC	ME204ES	Engineering Graphics	1	0	4	3
5	BSC	PH205BS	Applied Physics Lab	0	0	3	1.5
6	ESC	CS206ES	Programming for Problem Solving Lab	0	0	3	1.5
7	MC	MC207ES	Environmental Science	3	0	0	0
8	MC	MC208	Business English	2	0	0	0
Total				**15**	**3**	**10**	**18**

Note: *MC = Satisfactory/Unsatisfactory

MA201BS: MATHEMATICS – II
(ADVANCED CALCULUS& ELEMENTARY COMBINATORICS) (Common to CE, EEE, ME, ECE, CSE, IT, AI, AI&ML, DSE)

B.Tech. I Year II Semester

Course Code	Category	Hours/Week			Credits	Maximum Marks		
		L	T	P	C	CIA	SEE	Total
MA201BS	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
- Methods of solving the differential equations of first and higherorder.
- Evaluation of multiple integrals and theirapplications
- The physical quantities involved in engineering field related to vector valuedfunctions
- The basic properties of vector valued functions and their applications to line, surface and volumeintegrals
- Concept of Recurrence Relations and generatingfunctions

Course Outcomes: After learning the contents of this paper the student must be able to
- Identify whether the given differential equation of first order is exact ornot
- Solve higher differential equation and apply the concept of differential equation to real worldproblems
- Evaluate the multiple integrals and apply the concept to find areas, volumes, centre of mass and Gravity for cubes, sphere and rectangularparallelopiped
- Evaluate the line, surface and volume integrals and converting them from one toanother
- Apply the concepts of advanced countingtechniques

Unit: I	First Order ODE	No.of Classes: 09(L), 03(T)

Exact, linear and Bernoulli's equations; Applications : Newton's law of cooling, Law of natural growth and decay; Equations not of first degree: equations solvable for p, equations solvable for y, equations solvable for x and Clairaut's type.

Unit: II	Ordinary Differential Equations of Higher Order	No.of Classes: 09(L), 03(T)

Second order linear differential equations with constant coefficients: Non-Homogeneous terms of the type e^{ax}, sin ax, cos ax, polynomials in x, $e^{ax}V(x)$ and x $V(x)$; method of variation of parameters; Equations reducible to linear ODE with constant coefficients: Legendre's equation, Cauchy-Euler equation.

Unit: III	Multivariable Calculus (Integration)	No.of Classes: 09(L), 03(T)

Evaluation of Double Integrals (Cartesian and polar coordinates); change of order of integration (only Cartesian form); Evaluation of Triple Integrals: Change of variables (Cartesian to polar) for double and (Cartesian to Spherical and Cylindrical polar coordinates) for triple integrals.
Applications: Areas (by double integrals) and volumes (by double integrals and triple integrals), Centre of mass and Gravity (constant and variable densities) by double and triple integrals (applications involving cubes, sphere and rectangular parallelopiped).

Unit: IV	Vector calculus	No.of Classes: 09(L), 03(T)
Gradient, Divergence, Curl, Line integral, conservative fields, Green's theorem, surface area of solids of revolution, surface area, surface integral, Triple integrals and Gauss Divergence theorem, Stokes' theorem (without proofs)		
Unit: V	**Counting (Recurrence Relations & Elementary Combinatorics)**	**No.of Classes: 09(L), 03(T)**
Basic counting,Pigeonhole principle, Permutations and Combinations, Binomial Coefficients, Application of Recurrence Relations, Solution of RecurrenceRelations, Generating functions,Inclusion – Exclusionand applications		

Text Books:

1. B.S. Grewal, Higher Engineering Mathematics, Khanna Publishers, 36th Edition,2010
2. Kenneth H. Rosen, Discrete Mathematics and Its Applications,McGrawHill.

Reference Books:

1. S. L. Ross, Differential Equations, 3rd Ed., Wiley India,1984.
2. G.B. Thomas and R.L. Finney, Calculus and Analytic geometry, 9thEdition,Pearson, Reprint,2002.
3. Higher Engineering Mathematics by B V Ramana, TataMcGraw-Hill
4. Discrete Mathematics for Computer Scientists and Mathematicians by Joe R. Mott, AbrahamKandel, Theodore P. Baker, Prentice-Hall of India Pvt.Ltd.

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 /
PH202BS: APPLIED PHYSICS
(For All Circuit Branches)

APPLIED PHYSICS

R 20-B. TECH- I YEAR
I SEMESTER: ECE, CSE (IoT), CSE (AI/ML) II SEMESTER: CSE, IT, EEE, CSE(DS)

Course Code	Category	Hours/Week			Credits	Maximum Marks		
		L	T	P	C	CIA	SEE	TOTAL
PH102 /202BS	BS	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. Understand 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. Apply the knowledge to understand the nature of different dielectric and magnetic materials and electromagnetic theory to solve problems in them

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 materialsand explain the basics of electromagnetic theory

UNIT 1:	QUANTUM MECHANICS	No. of Classes: 12

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	No. of Classes: 15

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	No. of Classes: 10

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	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

UNIT 5:	ELECTROMAGNETISM & MAGNETIC PROPERTIES OF MATERIALS	No. of Classes: 11

Laws of electrostatics, Electric current and the continuity equation, Ampere's and Faraday's laws,

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=0yC02DWq3mI
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

CS103ES/CS203ES: PROGRAMMING FOR PROBLEM SOLVING

B. Tech I Year II Semester

Course Code	Category	Hours/Week			Credits	Maximum Marks		
		L	T	P	C	CIA	SEE	Total
CS103ES/CS203ES	ESC	3	1	-	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 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:

- 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 advances C programs.

Unit-1	COMPUTER FUNDAMENTALS AND INTRODUCTION TO C LANGUAGE	No. of Classes: 15

Introduction to components of a computer system: disks, primary and secondary memory, processor, operatin ystem, compilers, creating, compiling and executing a program etc., Number systems
Introduction to Algorithms: steps to solve logical and numerical problems. Representation of Algorithm lowchart/Pseudo code with examples, Program design and structured programming **Introduction to Programming Language**: variables (with data types and space requirements), Syntax and Logical Errors i ompilation, object and executable code , Operators, expressions and precedence, Expression evaluation, Storag lasses (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, i lse, 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	No. of Classes: 14

Arrays: one and two dimensional arrays, creating, accessing and manipulating elements of arrays **Strings** ntroduction to strings, handling strings as array of characters, basic string functions available in C (strlen, strca trcpy, 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-referentia tructures, usage of self referential structures in linked list (no implementation) **Enumeration data type**

Unit-3	Files	No. of Classes: 09

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 eading structures using binary files, Random access using fseek, ftell and rewind functions.

Unit-4	Functions	No. of Classes: 10

Functions: Designing structured programs, Declaring a function, Signature of a function, Parameters and retur ype of a function, passing parameters to functions, call by value, Passing arrays to functions, passing pointers t unctions, 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	No. of Classes: 12

Algorithms for finding roots of a quadratic equations, finding minimum and maximum numbers of a given set, inding 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)

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/ME204ES: ENGINEERING GRAPHICS

B.Tech I year I semester

Course Code	Category	Hours/Week			Credits	Max Marks		
		L	T	P	C	CIA	SEE	Total
ME104ES/ME204ES	ESC	1	0	4	3	30	70	100
Contact Classes: 15	Tutorial Classes: 0	Practical Classes: 60				Total Classes: 75		

Prerequisite: None

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 and information.
- Read, understand and interpret engineering drawings.

UNIT-1	Introduction to Engineering Drawing	No. of classes: 15

Introduction to Engineering Drawing: Principles of Engineering Graphics and their Significance, Conic Sections including the Rectangular Hyperbola – General method only. Cycloid, Epicycloid and Hypocycloid, Scales – Plain & Diagonal

UNIT-2	Orthographic Projections	No. of classes :15

Orthographic Projections: Principles of Orthographic Projections – Conventions – Projections of Points and Lines, Projections of Plane regular geometric figures.—Auxiliary Planes

UNIT-3	Projections of Regular Solids	No. of classes :15

Projections of Regular Solids – Auxiliary Views - Sections or Sectional views of Right Regular Solids – Prism, Cylinder, Pyramid, Cone – Auxiliary views – Sections of Sphere

UNIT-4	Development of Surfaces of Right Regular Solids	No. of classes :15

Development of Surfaces of Right Regular Solids – Prism, Cylinder, Pyramid and Cone, Intersection of Solids: Intersection of – Prism vs Prism- Cylinder Vs Cylinder

UNIT-5	Isometric Projections	No. of classes :15

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 Vela Murali/ 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. https://ndl.iitkgp.ac.in/

E-text Books :

PH 105BS/PH205BS: APPLIED PHYSICS LAB

R 20- B.Tech. I Year I/II Semester

Course code	Category	Hours/week			Credits	Maximum Marks		
		L	T	P	C	CIA	SEE	Total
PH 105BS/ PH205BS	BSC	-	-	3	1.5	30	70	100
Contact Classes: Nil	Tutorial Classes: Nil	Practical Classes: 45				Total Classes:45		

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 various electrical, magnetic and optical tools for measuring relatedparameters
3. To Apply the analytical techniques and graphical analysis to the experimental data
4. To develop intellectual communication skills and discuss the basic principles of scientificconceptsin a group

Course Outcomes:

At the end of this course, the student will be able to

1. Operate different sets of measuring tools and techniques
2. Compute relevant physical quantities from the observed measurementsand interpret through graphical methodsin experiments using LCR, RC, LED, Solar Cell, Laser Diode circuit boards
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:

) **Charging, discharging and time constant of an R-C circuit**
) **L-C-R circuit – Resonance & Q-factor**
) **Magnetic field along the axis of current carrying coil – Stewart and Gees method**
) **Study the characteristics of a LED**
) **Study the characteristics of a LASER diode**
) **Bending losses of fibres & Evaluation of numerical aperture of a given fibre**
) **Energy gap of a material of p-n junction**
) **Hall Effect- Determination of Hall Coefficient**
) **Solar Cell-I-V Characteristics and Fill Factor**
0) **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

CS106ES/CS206ES: PROGRAMMING FOR PROBLEM SOLVING LAB

B.Tech. I Year II Semester

Course Code	Category	Hours/Week			Credits	Maximum Marks		
		L	T	P	C	CIA	SEE	Total
CS106ES/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, contro 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

. Write a simple program that prints the results of all the operators available in C (including pre/ post incremen , 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 buildin 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 th 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.

Decision Making statements

. 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 operatio 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% t <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.

Loop:

. Write a program that prints a multiplication table for a given number and the number of rows in the table. Fo xample, for a number 5 and rows = 3, the output should be:

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

. 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
 8 9 10
```

b.
```
1
01
101
0101
10101
```

c.
```
   1
  22
 333
4444
55555
```

d. *

*

. 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 ……

oop with Decision making Statements:

. Write a program that shows the binary equivalent of a given positive number between 0 to 255.
. Write a program that finds if a given number is a prime number
. Write a C program to find the sum of individual digits of a positive integer and test given number is palindrome.
. 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 t generate the first n terms of the sequence.
. Write a C program to generate all the prime numbers between 1 and n, where n is a value supplied by th user.
. Write a C program to read in two numbers, x and n, and then compute the sum of this geometric progressior 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.
. Write a C program to print all Perfect numbers between 1 to n.
. C program to print all Armstrong numbers from 1 to N.

unction

. Write a C program to calculate factorial of a given number using function & recursion.
. Write a C Program for call by value & call by reference.
. Write a C program to calculate GCD of two number using function & recursion.
. Write a C program to calculate LCM of two number using function & recursion.
. Write a C program to find x^n using recursion.
. Write a C program o find minimum and maximum value from given two values using a macro.
. Write a C program to demonstrate the storage classes.
. Write a C program to demonstrate pre processor commands.

rrays

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

orting and Searching:

. 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.
. 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.
. Write a C program that implements the Bubble sort method to sort a given list of integers in ascending order.
. Write a C program that sorts the given array of integers using selection sort in descending order
. Write a C program that sorts the given array of integers using insertion sort in ascending order
. Write a C program that sorts the given array of integers using merge sort and quick sort in ascending order

ointers & Dynamic Memory Allocation

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

trings:

. Write a C program to convert a Roman numeral ranging from I to L to its decimal equivalent

. Write a C program to count the lines, words and characters in a given text.
. Write a C program that sorts a given array of names

tructures

. 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.
. 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.
. 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.

iles:

. Write a C program to display the contents of a file to standard output device.
. Write a C program which copies one file to another, replacing all lowercase characters with their uppercase equivalents.
. 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.
. 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 th command line. (hint: convert the strings using atoi function) Now the program asks for an index and a valu from the user and the value at that index should be changed to the new value in the file. (hint: use fsee function) The program should then read all 10 values and print them back.
. 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 th second are put in the third file).
. Write a C program to display first n characters of a file in reverse order.

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

A Computer System with Ubuntu operating system and GCC Compiler

<u>eferences</u>

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

MC107ES/ MC207ES: ENVIRONMENTAL SCIENCE

B.Tech. I Year II Semester

Course Code	Category	Hours/Week			Credits	Maximum Marks		
		L	T	P	C	CIA	SEE	Total
MC107ES/ MC207ES	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 / develop technologies on the basis of ecological principles and environmental regulations which in turn helps in sustainable development

UNIT: I	Ecosystems	No. of Classes: 09

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, Biomagnification, ecosystem value, services and carrying capacity, Field visits.

UNIT: II	Natural Resources& Energy resources	No. of Classes: 09

Natural Resources: Classification of Resources: Living and Non-Living resources, **water resources:** use and over utilization of surfac and ground water, floods and droughts, Dams: benefits and problems. **Mineral resources:** use and exploitation, environmental effects o extracting and using mineral resources, **Land resources:** Forest resources, **Energy resources:** growing energy needs, renewable and no renewable energy sources, use of alternate energy source, case studies.

UNIT: III	Biodiversity And Biotic Resources	No. of Classes: 09

Biodiversity And Biotic Resources: Introduction, Definition, genetic, species and ecosystem diversity. Value of biodiversity; consumptiv use, productive use, social, ethical, aesthetic and optional values. India as a mega diversity nation, Hot spots of biodiversity. Field visi Threats to biodiversity: habitat loss, poaching of wildlife, man-wildlife conflicts; conservation of biodiversity: In-Situ and Ex-sit conservation. National Biodiversity act.

UNIT: IV	Environmental Pollution and Control Technologies	No. of Classes: 09

Environmental Pollution and Control Technologies: Environmental Pollution: Classification of pollution, **Air Pollution:** Primary an 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 i management.

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

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

UNIT: V	Environmental Policy, Legislation & EIA	No .of Classes: 09

Environmental Policy, Legislation & EIA: Environmental Protection act, Legal aspects Air Act- 1981, Water Act, Forest Act, Wild lif Act, Municipal solid waste management and handling rules, biomedical waste management and handling rules, hazardous waste managemen 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, Lif Cycle assessment (LCA), Low carbon life style.

Text Books:

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

Web References:

.Fundamental concepts in Environmental Studies by Dr.D.DMishra
.Basis of Environmental Science by Micheal Allaby

-Text Books:

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

MC108/MC208: BUSINESS ENGLISH

B.Tech. I Year II Semester

Course Code	Category	Hours/Week			Credits	Maximum Marks		
		L	T	P	C	CIA	SEE	Tota
MC108/208	MC	2	0	0	0	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

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

Module: I	*COMMUNICATION*	No.of Classes: 07

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

Module: II	DEVELOPMENT AND TRAINING	No.of Classes: 06

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

Module: III	CORPORATE CULTURE	No.of Classes: 05

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

Module: IV	BEING PERSUASIVE	No.of Classes: 06

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

Vocabulary: Avoiding Clichés, Idioms and Phrases

Reference Books:

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

Web References:

9. elt.oup.com/learning resources
10. www.cambridgeenglishonline.org
11. www.eslcafe.com
12. bbc.co.uk/worldservice/learningenglish
13. www.manythings.org

E-Text Books:

3. The secret to perfecting your grammar - Bloomsbury International