ACE EngineeringCollege

(An Autonomous Institution)

Ankushapur(V), Ghatkesar(M), Medchal.Dist - 501301

EPARTMENT OF ELECTRONICS AND COMMUNICATION ENGINEERING

B.TECH I YEAR COURSE STRUCTURE & SYLLABUS

IYear								I Semester
S.No.	Course Type	Course Code	Course Title	% of Deviation	Periods Per Week			Credits
					L	T	P	
1	BSC	MA101BS	Mathematics – I	0	3	1	0	4
2	BSC	PH102BS	Applied Physics	8	3	1	0	4
3	ESC	CS103ES	Programming for problem Solving	8	3	1	0	4
4	ESC	ME104ES	Engineering Graphics	0	1	0	4	3
5	BSC	PH105BS	Applied Physics Lab	0	0	0	3	1.5
6	ESC	CS106ES	Programming for problem Solving Lab	2	0	0	3	1.5
7	MC	MC107ES	Environmental Science	0	3	0	0	0
8	MC	MC108	Business English	-	2	0	0	0
			Induction Programme	-				
Total					**15**	**3**	**10**	**18**

IYear								II Semester
S.No.	Course Type	Course Code	Course Title	% of Deviation	Periods Per Week			Credits
					L	T	P	
1	BSC	MA201BS	Mathematics – II	20	3	1	0	4
2	BSC	CH202BS	Engineering Chemistry	15	3	1	0	4
3	ESC	EE203ES	Basic Electrical Engineering	2	3	0	0	3
4	ESC	ME205ES	Engineering Workshop	0	1	0	3	2.5
5	HSMC	EN205HS	English	0	2	0	0	2
6	ESC	CH206BS	Engineering Chemistry Lab	0	0	0	3	1.5
7	HSMC	EN207HS	English Language and Communication Skills Lab	0	0	0	2	1
8	ESC	EE208ES	Basic Electrical Engineering Lab	10	0	0	2	1
9	MC	MC209	Python Programming	-	1	0	2	0
10	MC	MC210	Aptitude & Reasoning	-	3	0	0	0
Total					**16**	**2**	**12**	**19**

MA101BS: MATHEMATICS – I

(Linear Algebra and Calculus)

(Common to CE, EEE, ME, ECE, CSE, IT, CSE(IoT), CSE(AI&ML), CSE(DS))

B.Tech. I Year I Semester								
Course Code	**Category**	**Hours/Week**			**Credits**	**Maximum Marks**		
MA101BS	**BSC**	**L**	**T**	**P**	**C**	**CIA**	**SEE**	**Total**
		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 - 1 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 - 2 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 - 3 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 - 4	**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 - 5	**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, 11thReprint,2010.
3. G.B. Thomas and R.L. Finney, Calculus and Analytic geometry, 9thEdition,Pearson, Reprint,2002.

Web References:

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

E-Text Books:

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

APPLIED PHYSICS (Unit Wise Syllabus Comparison)			
Existing JNTUH R18 Syllabus	**Proposed ACE-R20 Autonomous Syllabus**	**% Deviation with JNTUH R18 Syllabus**	**Reasons for the Deviation**
UNIT - I **Quantum Mechanics**	**UNIT - I** **Quantum Mechanics**	8%	The newly incorporated topics of Bloch'stheorem and Kronig- Penney model not only give aclear idea on the energy band structure of materials but also provide a better Understanding of the behavior semiconducting, optoelectronic and dielectric materials.
Introduction to quantum physics, Black body radiation, Planck's law, Photoelectric effect, Compton effect, de- Broglie's hypothesis, Wave- particle duality, Davisson and Germer experiment, Heisenberg's Uncertainty principle, Born's interpretation of the wave function, Schrodinger's time independent wave equation, Particle in one dimensionalbox.	Introduction to quantum physics, de-Broglie's hypothesis, Wave-particle duality, Davisson-Germerexperiment, 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.		

Total Deviation = 8%

PH102BS/PH202BS : APPLIED PHYSICS

B. TECH- I YEARI 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

PROGRAMMING FOR PROBLEM SOLVING

S.No.	Course Title	Deviation	Unit Numbers	Existing R18 JNTUH Syllabus	Proposed ACE R20 Autonomous Syllabus	% Deviation	Reason / Justification for Deviation	Remarks (If any)
1	**Programming for Problem Solving**	**YES**	**Unit 5** (Array and Applications)	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, sort algorithms) Basic concept of order of complexity through the example programs	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	**8%**	**To get more knowledge on array applications**	

CS103ES/CS203ES: PROGRAMMING FOR PROBLEM SOLVING

B. Tech I Year I Semester								
Course Code	**Category**	**Hours/Week**			**Credits**	**Maximum Marks**		
CS103ES/CS203ES	**Core**	**L**	**T**	**P**	**C**	**CIA**	**SEE**	**Total**
		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 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 C programs.
- 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** **No. of Classes: 15**

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), typeconversion, **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 ofstrings
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:

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)

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 of India
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%20Program ming%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	Maximum 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: Fundamental mathematical knowledge and thinking ability.

Course Objectives:

- To provide basic concepts inengineeringdrawing.
- To impart knowledge about standard principles of orthographic projectionofobjects.
- To draw sectional views and pictorial viewsofsolids.

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

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

Unit: I **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: II **Orthographic Projections**

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

Unit: III **Projections of Regular Solids**

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**

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**

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/PH205BS: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 / PH205 BS	BS	-	-	3	1.5	30	70	100
Contact Classes: Nil	Tutorial Classes: Nil	Practical Classes: 39				Total Classes:39		

Prerequisites: none

CourseObjectives:

To make thestudent

1. To gain knowledge by applying the experimental methods to correlate with the theoreticalconcepts
2. To learn the usage of various electrical, magnetic and optical tools for measuringrelatedparameters
3. To Apply the analytical techniques and graphical analysis to the experimentaldata
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 andtechniques
2. Compute relevant physical quantities from the observed measurementsand interpret through graphical methodsin experiments using LCR, RC, LED, Solar Cell, Laser Diode circuitboards
3. Compare the experimental results with their theoreticalcounterparts
4. Demonstrate basic communication skills through working in groups in performing thelaboratory experiments and by interpreting theresults

List of Experiments:

1) Charging, discharging and time constant of an R-Ccircuit
2) L-C-R circuit – Resonance &Q-factor
3) Magnetic field along the axis of current carrying coil – Stewart and Geesmethod
4) Study the characteristics of aLED
5) Study the characteristics of a LASERdiode
6) Bending losses of fibres& Evaluation of numerical aperture of a givenfibre
7) Energy gap of a material of p-njunction
8) Hall Effect- Determination of HallCoefficient
9) Solar Cell-I-V Characteristics and FillFactor
10) Photoelectric Effect- Determination of Planck'sConstant

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

List of EquipmentRequired:

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

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 MEnterprises, 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.

PROGRAMMING FOR PROBLEM SOLVING LAB

S.No.	Course Title	Deviation	Unit Numbers	Existing R18 JNTUH Syllabus	Proposed ACE R20 Autonomous Syllabus	% Deviation	Reason / Justification for Deviation	Remarks (If any)
1	**Programming for Problem Solving Lab**	**YES**	**Unit-1**	--	**For all the Programs writing Algorithm and drawing Flow chart is Mandatory.**	**2%**	**Added tasks on flow charts and algorithms to make students well knowledge to write algorithms and to draw flow charts for various programs**	

CS106ES/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
CS106ES/CS206ES	HSMC	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
```

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

10101 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/MC207ES: ENVIRONMENTAL SCIENCE

B.Tech. I Year I 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 sustainabledevelopment.
- Understanding the impacts of developmental activities and mitigationmeasures.
- Understanding the environmental policies andregulations

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 sustainabledevelopment

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, Biomagnification, 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, casestudies.

Unit - 3 Biodiversity And Biotic Resources

Biodiversity And Biotic Resources: Introduction, Definition, genetic, species and ecosystem 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.

GlobalEnvironmental 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

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.

TextBooks:

1 Textbook of Environmental Studies for Undergraduate Courses by ErachBharucha for University Grants Commission.
2 Environmental Studies by R. Rajagopalan, Oxford UniversityPress.

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 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.
6. 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/MC208:BUSINESS ENGLISH

B.Tech. I Year I Semester								
Course Code	**Category**	**Hours/Week**			**Credits**	**Maximum Marks**		
		L	**T**	**P**	**C**	**CIA**	**SEE**	**Total**
MC108/MC208	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:

To teach students how to apply the knowledge of grammar in everyday usage, illustrate the significance of communication in professional life and emphasize the need to be a continuous learner in the context of globalization.

Course Outcomes:

Students should be able to

1. Use English Language effectively in spoken and writtenforms.
2. Comprehend the given texts and respond appropriately in formal and informalsituations.
3. Communicate confidently in various contexts and differentcultures.
4. Acquire basic proficiency in English including reading and listening comprehension, writing andspeaking skills to perform effectively in personal and professionalcontexts.

Unit - 1 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 - 2 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 - 3 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 - 4	BEING PERSUASIVE
Reading: Reading for Negative Facts, The art of agreeing and disagreeing Listening: What makes people persuasive, People negotiating a sale at a tradefair Writing: A survey report, Completing a businessreport Speaking: Things that are important when making a presentation, shortpresentations Vocabulary: Cohesive Devices or Linkers, Collocations	
Unit - 5	**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. Swan, M. (2016). Practical English Usage. Oxford UniversityPress.
2. Kumar, S and Lata, P.(2018). Communication Skills. Oxford UniversityPress.
3. Wood, F.T. (2007).Remedial English Grammar.Macmillan.
4. Zinsser, William. (2001). On Writing Well. Harper ResourceBook.
5. Hamp-Lyons, L. (2006).Study Writing. Cambridge UniversityPress.
6. 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

MA201BS: MATHEMATICS – II

Unit Numbers	Existing R18 Syllabus	Proposed ACE R20	% of Deviation	Reason/Justification for Deviation	Remarks (if any)
Unit – IV	Vector point functions and scalar point functions. Gradient, Divergence and Curl. Directional derivatives, Tangent plane and normal line. Vector Identities. Scalar potential functions. Solenoidal and Irrotational vectors.	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)	-		R18 Unit – V topics are merged with R20Unit - IV
Unit –V	Line, Surface and Volume Integrals. Theorems of Green, Gauss and Stokes (without proofs) and their applications.	Basic counting, Pigeonhole principle, Permutations and Combinations, Binomial Coefficients, Application of Recurrence Relations, Solution of Recurrence Relations, Generating functions, Inclusion – Exclusion andapplications	20	These topics of Unit – V are very much required for all the branches of Engineering and also prerequisite for the trending technologies like Artificial Intelligence, Machine Learning & Data Science and for Better understanding of computer applications	

MA201BS: MATHEMATICS – II
(ADVANCED CALCULUS& ELEMENTARY COMBINATORICS) (Common to CE, EEE, ME, ECE, CSE, IT, CSE(IoT), 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: 1	**First Order ODE**

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: 2	**Ordinary Differential Equations of Higher Order**

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: 3	**Multivariable Calculus (Integration)**

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: 4	**Vector calculus**

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: 5	**Counting (Recurrence Relations & Elementary Combinatorics)**

Basic counting,Pigeonhole principle, Permutations and Combinations, Binomial Coefficients, Application ofRecurrence Relations, Solution of Recurrence Relations, 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 Courseshttps://storage.googleapis.com/uniquecourses/online.html
2) Directory of Open Access Journalshttps://doaj.org/
3) Springer Open Journalshttps://www.springeropen.com/journals
4) UG/PG MOOCshttp://ugcmoocs.inflibnet.ac.in/ugcmoocs/moocs_courses.php

E-Text Books:

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

Engineering Chemistry			
Existing JNTUH R18 Chemistry Syllabus	**Proposed ACE CHEMISTRY R20 Autonomous Syllabus**	**Percentage(%) of Deviation in ACE CHEMISTRY R20 Autonomous Syllabus with reference to JNTUHR18 Syllabus**	**Reasons / Justification for Deviation**
UNIT - V	**UNIT - V**		
Unit - V: **Spectroscopic techniques and applications:** Principles of spectroscopy, selection rules and applications of electronic spectroscopy. vibrational and rotational spectroscopy. Basic concepts of Nuclear magnetic resonance Spectroscopy, chemical shift. Introduction to Magnetic resonance imaging..	**UNIT-V** **MATERIAL SCIENCE(POLYMERS,CERAMICS AND COMPOSITEMATERIALS)& SPECTROSCOPY** **POLYMERS:** Introduction, classification, Types of polymerization, Thermoplastics and thermosetting polymers, synthesis and applications of poly vinyl chloride, Bakelite, nylon 6,6 **COMPOSITE MATERIALS:** Composites - Constitution, classification, Particle reinforced composites, Fiber-reinforced composites, Metal-matrix composites, Carbon-carbon composites Structural composites, Advantages and applications. **CERAMICS :**Different types of ceramic crystal structures, Clay products, Advanced ceramics, Ceramic ball bearings, Cements. **SPECTROSCOPY:** Introduction to spectroscopy, IR spectra and its applications	15	**Chemistry is common to circuit and non-circuit branches. For Civil and Mechanical engineering students study of smart materials is required. For Circuit branches study of smart materials being used in all the electronic and technical gadgets required.** **We intent that all upcoming engineers should have insight of these smart materials in the manufacture of technical gadgets in**

CH202BS: ENGINEERING CHEMISTRY

B.Tech. I Year II Semester

Course Code	Category	Hours/Week			Credits	Maximum Marks		
		L	T	P	C	CIA	SEE	Total
CH202BS	Basic Sciences	3	1	-	4	30	70	100
Contact Classes: 45	Tutorial Classes: 15	Practical Classes: Nil				Total Classes: 60		

Prerequisite: Nil

Course Objectives:

- To bring adaptability to the concepts of chemistry and to acquire the required skills to become a perfect engineer.
- To impart the basic knowledge of atomic, molecular and electronic modifications which makesthe student to understand the technology based onthem.
- To acquire the knowledge of electrochemistry, corrosion and water treatment which are essentialfor the Engineers and inindustry?
- To impart the knowledge of stereochemistry and synthetic aspects useful for understanding reaction pathways.
- To acquire the knowledge of preparation, properties and applications of engineeringmaterials.

Course Outcomes: The basic concepts included in this course will help the student to gain:

- The knowledge of atomic, molecular and electronic changes, band theory relatedto conductivity.
- The basic principles of water treatment & various methods of water treatment that can be employed in industries and domestic areas.
- The required principles and concepts of electrochemistry and corrosion.
- The knowledge of configurational and conformational analysis of molecules and reaction mechanisms.
- The knowledge of preparation, properties and applications of engineeringmaterials.

Unit - 1 MOLECULAR STRUCTURE AND THEORIES OF BONDING

Atomic and Molecular orbitals, Linear Combination of Atomic orbitals (LCAO), molecular orbitals of diatomic molecules, molecular orbital energy level diagrams of N_2,$O_2$and F_2molecules. Π- molecular orbitals of butadiene and benzene.

Crystal Field Theory (CFT): Salient Features of CFT – Crystal Field Splitting of transition metal ion d-orbitals in Tetrahedral, Octahedral and square planar geometries. Band structure of solids and effect of doping on conductance.

Unit - 2 WATER AND ITS TREATMENT

Water and its treatment: Introduction – hardness of water – Causes of hardness - Types of hardness: temporary and permanent – expression and units of hardness – Estimation of hardness of water by complexometric method. Potable water and its specifications. Steps involved in treatment of water – Disinfection of water by chlorination and ozonization. Boiler feed water and its treatment – Calgon conditioning, Phosphate conditioning and Colloidal conditioning. External treatment of water – Ion exchange process. Desalination of water – Reverse osmosis. Numericalproblems.

Unit - 3	ELECTROCHEMISTRY AND CORROSION

Electro Chemistry: Electro chemical cells – electrode potential, standard electrode potential, types of electrodes – calomel, Quinhydrone and glass electrode. Nernst equation Determination of pH of a solution by using quinhydrone and glass electrode. Electrochemical series and its applications. Numerical problems. Potentiometric titrations. Batteries – Primary (Lithium cell) and secondary batteries (Lead – acid storage battery and Lithium ion battery).

Corrosion: Causes and effects of corrosion – theories of chemical and electrochemical corrosion – mechanism of electrochemical corrosion, Types of corrosion: Galvanic, water-line and pitting corrosion- Factors affecting rate of corrosion - Corrosion control methods - Cathodic protection– Sacrificial anode and impressed current cathodic methods. Surface coatings – metallic coatings – methods of application, Electroless plating of Nickel .

Unit - 4	STEREOCHEMISTRY, REACTION MECHANISM AND SYNTHESIS OF DRUG MOLECULES

Introduction to representation of 3-dimensional structures, Structural and stereoisomers, configurations, symmetry and chirality. Enantiomers, diastereomers, optical activity and Absolute configuration. Conformation analysis ofn- butane. Substitution reactions: Nucleophilic substitution reactions: Mechanism of S_N1, $S_N2$reactions.

Electrophilic and nucleophilic addition reactions: Addition of HBr to propene. Markownikoff and Anti Markownikoff's additions. Grignard additions on carbonyl compounds.

Elimination reactions: Dehydrohalogenation of alkylhalides. Saytzeffrule. Oxidation Reactions :Oxidation of alcohols using $KMnO_4$andchromicacid.Reductionreactions:Reductionofcarbonylcompoundsusing$LiAlH_4$,$NaBH_4$.Hydroboration of olefins. Structure, synthesis and pharmaceutical applications of Paracetamol and Aspirin.

Unit - 5	MATERIAL SCIENCE(POLYMERS, COMPOSITE MATERIALS CERAMICS AND COMPOSITE MATERIALS) & SPECTROSCOPY

POLYMERS: Introduction, classification, Types of polymerization, Thermoplastics and thermosetting polymers, synthesis and applications of poly vinyl chloride, Bakelite, nylon 6,6

COMPOSITE MATERIALS: Composites - Constitution, classification, Particle reinforced composites, Fiber-reinforced composites, Metal-matrix composites, Carbon-carbon composites Structural composites, Advantages and applications.

CERAMICS: Different types of ceramic crystal structures, Clay products, Advanced ceramics, Ceramic ball bearings, Cements.

SPECTROSCOPY: Introduction to spectroscopy, IR spectra and its applications

Text Books:

1. **ENGINEERING CHEMISTRY BY JAIN & JAIN (GOEL PUBLICATIONS)**
2. **ENGINEERING CHEMISTRY BY SHASHI CHAWLA**
3. A TEXT BOOK OF ENGINEERING CHEMISTRY BY DR S.S DHARA& DR.K. MUKKANTI.(S.ChandPublications)
4. A TEXT BOOK OF ENGINEERING CHEMISTRY BY DR BHARATHI KUMARI YALAMANCHALI.(VGS TechnoSeries)

Reference Books:

1. Physical Chemistry, by P.W.Atkins
2. Organic Chemistry: StructureandFunction byK.P.C. Volhardtand N.E.Schore, 5th Edition.
3. University Chemistry, by B.M. Mahan, Pearson IVEdition.

Web References:

1. Engineering Chemistry (NPTEL Web-book), by B.L. Tembe, Kamaluddin andM.S.Krishnan.
2. Engineering Chemistry by P.C.Jain&M.Jain; Dhanpat Rai Publishing Company (P)Ltd., NewDelhi.

E-Text Books:

1.[ebook] Central library IIT Indore (www.library.iiti.ac.in)
2.[ebook]Chemistry by Royal Society of Chemistry (https://www.rsc.org>ebooks)

BASIC ELECTRICAL ENGINEERING			
Existing JNTUH R18 Syllabus	**Proposed ACE EEE R20 Autonomous Syllabus**	**Percentage(%) of Deviation in ACE EEE R20 Autonomous Syllabus with reference to JNTUH R18 Syllabus**	**Reasons / Justification for Deviation**
UNIT - I	**UNIT - I**		
Electrical circuit elements (R, L and C), voltage and current sources, KVL&KCL, analysis of simple circuits with dc excitation. Superposition, Thevenin and Norton Theorems. Time-domain analysis of first-order RL and RC circuits	Electrical circuit elements (R, L and C), voltage and current sources, KVL & KCL, analysis of simple circuits with dc excitation. Superposition, Thevenin and Norton Theorems. Star-Delta Transformations	**1**	Added Star-Delta Transformations topic. And added that (Elementary Treatment only) in all units at the end as per BOS Members Suggestions.
UNIT - IV	**UNIT - IV**		
Generation of rotating magnetic fields, Construction and working of a three-phase induction motor, Significance of torque-slip characteristic. Loss components and efficiency, starting and speed control of induction motor. Single-phase induction motor. Construction, working, torque-speed characteristic and speed control of separately excited dc motor. Construction and working of synchronous generators.	D.C. Machines: Construction, Principle and Types of D.C Machines. Speed control of separately excited dc motor. Induction Motors: Generation of rotating magnetic fields, Construction and working of a three-phase induction motor, Significance of torque-slip characteristic. Loss components and efficiency, starting and speed control of induction motor. Single-phase induction motor. Construction, working, torque-speed characteristic Synchronous Generators: Construction and working of synchronous generators. (Elementary Treatment Only)	**1**	Added D.C. Machines: Construction, Principle and Types of D.C Machines. And arranged in order of Machines as per BOS Members Suggestions.
UNIT - V	**UNIT - V**		
Components of LT Switchgear: Switch Fuse Unit (SFU), MCB, ELCB, MCCB, Types of Wires and Cables, Earthing. Types of Batteries, Important Characteristics for Batteries. Elementary calculations for energy consumption, power factor improvement and battery backup.	Components of LT Switchgear: Switch Fuse Unit (SFU), MCB, ELCB, MCCB, Types of Wires and Cables, Earthing. Types of Batteries, Important Characteristics for Batteries. Elementary calculations for energy consumption, power factor improvement and battery backup. (Elementary Treatment Only)	**0**	**Nil**

EE103ES/ EE203ES: BASIC ELECTRICAL ENGINEERING

B. Tech. I Year I Semester								
Course Code	**Category**	**Hours/Week**			**Credits**	**Maximum Marks**		
		L	**T**	**P**	**C**	**CIA**	**SEE**	**Total**
EE103ES/ EE203ES	**ESC**	**3**	**0**	**0**	**3**	**30**	**70**	**100**
Content Classes: 45	**Tutorial Classes: Nil**	**Practical Classes: Nil**			**Total Classes: 45**			

Prerequisite: Fundamentals of Physics

Course Objectives:

1. To introduce the concepts of electrical circuits and its components
2. To understand AC single phase circuits and concept of power factor.
3. To realize the operation of Transformers.
4. To recognize the working of three phase Induction Motor.

Course Outcomes:

Students are able

1. To resolve electrical circuits using network laws and theorems.
2. To able operate resonance in series RLC circuits.
3. To identify losses and calculate the efficiency of Transformer.
4. To realize Torque-Speed Characteristics of Three phase Induction Motor.
5. To analyze importance of Earthing and Energy Consumption.

UNIT: I	**D.C. Circuits**	**No. of Classes: 09**

Electrical circuit elements (R, L and C), voltage and current sources, KVL & KCL, analysis of simple circuits with dc excitation. Superposition, Thevenin and Norton Theorems. Star-Delta Transformations.

UNIT: II	**A.C. Circuits**	**No. of Classes: 09**

Representation of sinusoidal waveforms, peak and rms values, phasor representation, real power, reactive power, apparent power, power factor, Analysis of single-phase ac circuits consisting of R, L, C, RL, RC, RLC combinations (series and parallel), resonance in series RL-C circuit. Three-phase balanced circuits, voltage and current relations in star and delta connections. (Elementary Treatment Only)

Module: III	**Transformers**	**No. of Classes: 09**

Ideal and practical transformer, equivalent circuit, losses in transformers, regulation and efficiency. Auto-transformer and three-phase transformer connections. (Elementary Treatment Only)

UNIT: IV	**Electrical Machines**	**No. of Classes: 09**

D.C. Machines: Construction, Principle and Types of D.C Machines. Speed control of separately excited dc motor.

Induction Motors: Generation of rotating magnetic fields, Construction and working of a three-phase induction motor, Significance of torque-slip characteristic. Loss components and efficiency, starting and speed control of induction motor. Single-phase induction motor. Construction, working, torque-speed characteristic

Synchronous Generators: Construction and working of synchronous generators. (Elementary Treatment Only)

UNIT: V	Electrical Installations	No. of Classes: 09

Components of LT Switchgear: Switch Fuse Unit (SFU), MCB, ELCB, MCCB, Types of Wires and Cables, Earthing. Types of Batteries, Important Characteristics for Batteries. Elementary calculations for energy consumption, power factor improvement and battery backup. (Elementary Treatment Only)

Text Books:

1. D.P Kothari and I.J Nagrath, Basic Electrical Engineering 3rd Edition , Tata Mc Graw Hill Education Private Limitted , 2009.
2. Sahdev S.K, Basic Electrical Engineering Pearson India Education Service Pvt. Ltd, 2015

Reference Books:

1.D. P .Kothari& I.J. Nagrath Theory and Problems of Basic Electrical Engineering by PHI. 2009.

2. V.K Mehta , Principles of Electrical Engineering , S. Chand Publications.2008.

3. C.L. Wadhwa, Basic Electrical Engineering, New Age International Pvt Ltd Publishers, 2007

4. Abhijit Chakrabarti, Sudipta Debnath, Soumitra Kumar Mandal, Basic Electrical and Electronics Engineering-II, 2016

Web Reference:

1. https://swayam.gov.in/ fundamentals of electrical engineering.
2. .https://www.sciencedirect.com/book/9780750646376/electrical-engineers-reference-book
3. https://www.pdfdrive.com/basic-electrical-engineering-books.html

ME105ES/ME205ES: ENGINEERING WORKSHOP

B.Tech. I Year II Semester

Course Code	Category	Hours/Week			Credits	Maximum Marks		
		L	T	P	C	CIA	SEE	Total
ME105ES/ME205ES	ESC	1	0	3	2.5	30	70	100
Contact Classes: 15	Tutorial Classes: 0	Practical Classes: 45				Total Classes: 60		

Prerequisite: Practical Skill

Course Objectives:

- To study of different hand operated power tools, uses andtheirdemonstration.
- To gain a good basic working knowledge required for the production ofvarious engineeringproducts.
- To provide hands on experience about use of different engineering materials,tools, equipments and processes those are common in theengineeringfield.
- To develop a right attitude, team working, precision and safety atworkplace.
- It explains the construction, function, use and application of different workingtools, equipmentandmachines.
- To study commonly usedcarpentryjoints.
- To have practical exposure to various welding andjoiningprocesses.
- Identify and use marking out tools, hand tools, measuring equipment and to work to prescribedtolerances.

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

- Study and practice on machine tools andtheiroperations
- Practiceonmanufacturingofcomponentsusingworkshoptradesincluding pluming, fitting, carpentry, foundry, house wiringandwelding.
- Identify and apply suitable tools for different trades of Engineeringprocesses including drilling, material removing,measuring,chiseling.
- Apply basic electrical engineering knowledge for housewiringpractice.

1 TRADES FOR EXERCISES:

At least two exercises from each trade:

1. Carpentry – (T-Lap Joint, Dovetail Joint, Mortise &TenonJoint)
2. Fitting – (V-Fit, Dovetail Fit &Semi-circularfit)
3. Tin-Smithy – (Square Tin, Rectangular Tray &ConicalFunnel)
4. Foundry – (Preparation of Green Sand Mould using Single Piece andSplitPattern)
5. Welding Practice – (Arc Welding &GasWelding)
6. House-wiring – (Parallel & Series, Two-way Switch andTubeLight)
7. Black Smithy – (Round to Square, Fan HookandS-Hook)

2.TRADES FOR DEMONSTRATION & EXPOSURE:

Plumbing, Machine Shop, Metal Cutting (Water Plasma), Power tools in construction and Wood Working

Text Books:

1. Workshop Practice /B. L. Juneja/Cengage
2. Workshop Manual / K.Venugopal/Anuradha.

Reference Books:

1. Work shop Manual - P. Kannaiah/ K.L.Narayana/SciTech
2. Workshop Manual /VenkatReddy/BSP

List of Equipments required

1.Benches
2. Sheet Metal Pieces for Conducting Experiment
3. Oil Fired and Coal Fired
4.Anvil
5. Swage Block
6. Sledge Hammer
7. Tong and other Black Smithy Tools
8. Wiring Board
9. Wiring Tools
10. Wiring Cables
11. Foundry Tools
12. Carpentry Vises
13. Cope and drag with Sweeps
14. Different Pattern
15. Core Boxes
16. Arc Welding machine
17. Tig welding Machine
18. Welding Tools
19. Power Hacksaw, Drilling Machine
20. Pipe Wise
21. Plumbing tools
22. Lathe Machine with all Accessories
23. Carpentry Tools
24. Water Plasma Cutting Machine
25. Wood Turning Lathe
26. Wood Pieces to Conduct Experiment
27. Bench Wises
28. Fitting Tools
29. Metal Pieces for Conducting Experiment
30. Tin Smithy Tools

EN105HS/EN205HS : ENGLISH

B.Tech. I Year II Semester								
Course Code	**Category**	**Hours/Week**			**Credits**	**Maximum Marks**		
		L	**T**	**P**	**C**	**CIA**	**SEE**	**Total**
EN105HS/EN205HS	HSMC	2	0	0	2	30	70	100
Contact Classes: 32	**Tutorial Classes: -**	Practical Classes: Nil				Total Classes: 32		

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

Course Overview:

In view of the growing importance of English as a tool for global communication and the consequent emphasis on training students to acquire language skills in the areas of Vocabulary, Speaking, Grammar, Reading and Writing. The students should be encouraged to read text both prose and poetry. Reading comprehension passages are given for practice in the class. The focus is on skill development, fostering ideas and practice of language skills.

Course Objectives:

I. To teach students how to Apply the knowledge of grammar in everydayusage.

II. To illustrate to students the significance of communication and emphasize the need to continue learning in the context ofglobalization.

III. To teach students how to Apply more effectively the theoretical andpractical components of English, Identify the need of effective communication and advantages.

IV. To teach students how to analyze different language Functionsand understand theRegisters.

V. To teach students how to improve proficiency in English with an emphasison Vocabulary, Grammar, Reading and Writing skills. Design and beautify the language and speak effectively by distinguishing formal and informalusage.

Course Outcomes:

Students should be able to

1. Use English Language effectively in spoken and writtenforms.
2. Comprehend the given texts and respondappropriately.
3. Communicate confidently in various contexts and differentcultures.
4. Acquire basic proficiency in English including reading and listening comprehension, writing andspeaking skills.

Unit - 1	**The Raman Effect**

Vocabulary Building: The Concept of Word Formation --The Use of Prefixes and Suffixes.
Grammar: Identifying Common Errors in Writing with Reference to Articles and Parts of Speech
Reading: Reading and Its Importance- Techniques for Effective Reading.
Basic Writing Skills: Sentence Structures -Use of Phrases and Clauses in Sentences- Importance of Proper Punctuation- Techniques for writing precisely – Paragraph writing –
Types, Structures and Features of a Paragraph - Creating Coherence-Organizing Principles of Paragraphs inDocuments.

Unit - 2	Ancient Architecture in India

Vocabulary: Synonyms and Antonyms.
Grammar: Identifying Common Errors in Writing with Reference to Noun-pronoun Agreement and Subject-verb Agreement.
Reading: Improving Comprehension Skills – Techniques for Good Comprehension
Writing: Format of a Formal Letter-Writing Formal Letters E.g.., Letter of Complaint, Letter of Requisition, Job Application with Resume.

Unit - 3	Blue Jeans

Vocabulary: Acquaintance with Prefixes and Suffixes from Foreign Languages in English to form Derivatives-Words from Foreign Languages and their Use in English.
Grammar: Identifying Common Errors in Writing with Reference to Misplaced Modifiers and Tenses.
Reading: Sub-skills of Reading- Skimming and Scanning
Writing: Nature and Style of Sensible Writing- Defining- Describing Objects, Places and Events – Classifying- Providing Examples or Evidence

Unit - 4	What Should You Be Eating

Vocabulary: Standard Abbreviations in English
Grammar: Redundancies and Clichés in Oral and Written Communication.
Reading: Comprehension- Intensive Reading and Extensive Reading
Writing: Writing Practices--Writing Introduction and Conclusion - Essay Writing-Précis Writing

Unit - 5	How a Chinese Billionaire Built Her Fortune

Vocabulary: Technical Vocabulary and their usage
Grammar: Common Errors in English
Reading: Reading Comprehension-Exercises for Practice
Writing: Technical Reports- Introduction – Characteristics of a Report – Categories of Reports Formats- Structure of Reports (Manuscript Format) -Types of Reports - Writing a Report.

Text Book:

1.Sudarshana, N.P. and Savitha, C. (2018). English for Engineers. Cambridge University Press.

Reference Books:

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

Web References:

1. **www.cambridgeenglishonline.org**
2. www.eslcafe.com
3. **bbc.co.uk/worldservice/learningenglish**

E-Text Books:

1. 1. The secret to perfecting your grammar - Bloomsbury International

CH106BS/CH206BS: ENGINEERING CHEMISTRY LAB

B.Tech. I Year II Semester								
Course Code	**Category**	**Hours/Week**			**Credits**	**Maximum Marks**		
CH106BS/CH206BS	**BASIC SCIENCE**	**L**	**T**	**P**	**C**	**CIA**	**SEE**	**Total**
		-	-	3	1.5	30	70	100
Contact Classes: Nil	**Tutorial Classes: Nil**	**Practical Classes: 45**				**Total Classes: 45**		

Prerequisite: Nil

Course Objectives: The course consists of experiments related to the principles of chemistry required for engineering student. The student will learn:

- Estimation of hardness and chloride content in water to check its suitability for drinkingpurpose.
- To determine the rate constant of reactions from concentrations as an function oftime.
- The measurement of physical properties like adsorption andviscosity.
- To synthesize the drug molecules and check the purity of organic molecules by thin layerchromatographic (TLC)technique.

List of Experiments:

1. Determination of total hardness of water by complexometric method usingEDTA
2. Determination of chloride content of water byArgentometry
3. Estimation of an HCl by Conductometrictitrations
4. Estimation of Acetic acid by Conductometrictitrations
5. Estimation of HCl by Potentiometrictitrations
6. Estimation of Fe^{2+} by Potentiometry using$KMnO_4$
7. Synthesis of Aspirin andParacetamol
8. Determination of acid value of coconutoil
9. Verification of freundlich adsorption isotherm-adsorption of acetic acid oncharcoal
10. Determination of viscosity of ground nut oil by using Ostwald'sviscometer.
11. Determination of partition coefficient of acetic acid between n-butanol andwater.
12. Determination of surface tension of a give liquid usingstalagmometer.
13. Thin layer chromatography calculation of R_f values. eg ortho and para nitrophenols.
14. Determination of rate constant of acid catalysed hydrolysis ofmethylacetate

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

1. CONDUCTIVITYMETER
2. POTENTIOMETER.
3. WATER DISTILLATIONSET
4. WATERBATH
5. TLCCHAMBER
6. UVCHAMBER
7. SHAKERBATH

EN107HS/EN207HS: ENGLISH LANGUAGE AND COMMUNICATION SKILLS LAB

B.TECH I YEAR II SEMESTER

COURSE CODE	CATEGORY	HOURS/WEEK			CREDITS	MAXIMUM MARKS		
		L	T	P	C	CIA	SEE	TOTAL
EN207HSEN107HS	HSMC	0	0	2	1	30	70	100
CONTACT CLASSES:NIL	TUTORIAL CLASSES:Nil	PRACTICAL CLASSES:32				TOTAL CLASSES :32		

PREREQUISITES: Knowledge of functional English, basics in grammar, understanding of LSRW skills

Course Objectives:

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

COURSE OUTCOME:

Students will be able to attain

Better understanding of nuances of English language through audio- visual experience and group activities

- Neutralization of accent for intelligibility
- Speaking skills with clarity and confidence which in turn enhances their employability skills

SYLLABUS

English Language and Communication Skills Lab (ELCS) shall have two parts:

a. Computer Assisted Language Learning (CALL) Lab

b. Interactive Communication Skills (ICS) Lab

Listening Skills

Objectives

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

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

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

Speaking Skills

Objectives

1. To involve students in speaking activities in various contexts
2. To enable students express themselves fluently and appropriately in social and professional contexts

• Oral practice: Just A Minute (JAM) Sessions
• Describing objects/situations/people
• Role play – Individual/Group activities

Module: I	Exercise-I	
CALL Lab: Understand: Listening Skill- Its importance – Purpose- Process- Types- Barriers of Listening. Practice: Introduction to Phonetics – Speech Sounds – Vowels and Consonants. **ICS Lab:** Understand: Communication at Work Place- Spoken vs. Written language. Practice: Ice-Breaking Activity and JAM Session- Situational Dialogues – Greetings – Taking Leave – Introducing Oneself and Others.		
Module: II	**Exercise-II**	
CALL Lab: Understand: Structure of Syllables – Word Stress and Rhythm– Weak Forms and Strong Forms in Context. Practice: Basic Rules of Word Accent - Stress Shift - Weak Forms and Strong Forms in Context. **ICS Lab:** Understand: Features of Good Conversation – Non-verbal Communication. Practice: Situational Dialogues – Role-Play- Expressions in Various Situations –Making Requests and Seeking Permissions - Telephone Etiquette.		
Module: III	**Exercise-III**	
CALL Lab: Understand: Intonation-Errors in Pronunciation-the Interference of Mother Tongue (MTI). Practice: Common Indian Variants in Pronunciation – Differences in British and American Pronunciation. **ICS Lab:** Understand: How to make Formal Presentations. Practice: Formal Presentations.		
Module: IV	**Exercise-IV**	
CALL Lab: Understand: Listening for General Details. Practice: Listening Comprehension Tests. **ICS Lab:** Understand: Public Speaking – Exposure to Structured Talks. Practice: Making a Short Speech – Extempore.		
Module: V	**Exercise- V**	
CALL Lab: Understand: Listening for Specific Details. Practice: Listening Comprehension Tests. **ICS Lab:** Understand: Interview Skills. Practice: Mock Interviews.		

Reference Books:

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

Web References:

1. **elt.oup.com/learning resources**
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

BASIC ELECTRICAL ENGINEERINGLAB			
Existing JNTUH R18 Syllabus	**Proposed ACE EEE R20 Autonomous Syllabus**	**% Deviation with JNTUH R18 Syllabus**	**Reasons / Justification for Deviation**
EXPERIMENTS	**EXPERIMENTS**		
List of Experiments: 1. Verification of Ohms Law 2. Verification of KVL and KCL 3. Transient Response of Series RL and RC circuits using DC excitation 4. Transient Response of RLC Series circuit using DC excitation 5. Resonance in series RLC circuit 6. Calculations and Verification of Impedance and Current of RL, RC and RLC series circuits 7. Measurement of Voltage, Current and Real Power in primary and Secondary Circuits of a Single Phase Transformer 8. Load Test on Single Phase Transformer (Calculate Efficiency and Regulation) 9. Three Phase Transformer: Verification of Relationship between Voltages and Currents (Star-Delta, Delta-Delta, Delta-star, Star-Star) 10. Measurement of Active and Reactive Power in a balanced Three-phase circuit 11. Performance Characteristics of a Separately/Self Excited DC Shunt/Compound Motor 12. Torque-Speed Characteristics of a Separately/Self Excited DC Shunt/Compound Motor 13. Performance Characteristics of a Three-phase Induction Motor 14. Torque-Speed Characteristics of a Three-phase Induction Motor 15. No-Load Characteristics of a Three-phase Alternator.	**List of Experiments: The following 1-12 experiments are to be conducted compulsorily.** 1. Verification of Ohms Law 2. Verification of KVL and KCL 3. Resonance in series RLC circuit 4. Calculations and Verification of Impedance and Current of RL, RC and RLC series circuits 5. Measurement of Voltage, Current and Real Power in primary and Secondary Circuits of a Single Phase Transformer 6. Load Test on Single Phase Transformer to Calculate Efficiency 7. Load Test on Single Phase Transformer to calculate Regulation 8. Measurement of Active and Reactive Power in a balanced Three-phase circuit 9. Performance Characteristics of a DC Motors 10. Torque-Speed Characteristics of a DC Motors 11. Performance Characteristics of a Three-phase Induction Motor 12.Torque-Speed Characteristics of a Three-phase Induction Motor	**10**	Removed Experiment number 3, 4, 9 and 15 as per BOS Members Suggestions.

EE108ES/ EE208ES: BASIC ELECTRICAL ENGINEERING LAB

B.Tech. I Year I Semester

Course Code	Category	Hours/Week			Credits	Maximum Marks		
		L	T	P	C	CIA	SEE	Total
EE203ES	ESC	0	0	2	1	30	70	100
Contact Classes: Nil	Tutorial Classes: Nil	Practical Classes: 45				Total Classes: 45		

Prerequisite: BASIC ELECTRICAL ENGINEERING

Course Objectives:

1. To introduce the concepts of electrical circuits and its components
2. To understand AC single phase circuits and concept of power factor.
3. To realize the operation of Transformers.
4. To recognize the working of three phase Induction Motor.

Course Outcomes:

1. To resolve electrical circuits using network laws and theorems.
2. To able operate resonance in series RLC circuits.
3. To identify losses and calculate the efficiency of Transformer.
4. To realize Torque-Speed Characteristics of Three phase Induction Motor.
5. To analyze importance of Earthing and Energy Consumption.

List of Experiments:

1. Verification of Ohms Law
2. Verification of KVL and KCL
3. Resonance in series RLC circuit
4. Calculations and Verification of Impedance and Current of RL, RC and RLC series circuits
5. Measurement of Voltage, Current and Real Power in primary and Secondary Circuits of a Single Phase Transformer
6. Load Test on Single Phase Transformer to Calculate Efficiency
7. Load Test on Single Phase Transformer to calculate Regulation
8. Measurement of Active and Reactive Power in a balanced Three-phase circuit
9. Performance Characteristics of a DC Motors
10. Torque-Speed Characteristics of a DC Motors
11. Performance Characteristics of a Three-phase Induction Motor
12. Torque-Speed Characteristics of a Three-phase Induction Motor

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

1. Ohms Law kit
2. KVL and KCL kit
3. Resonance in series RLC circuit kit
4. Calculations and Verification of Impedance and Current of RL, RC and RLC series circuits panel
5. Measurement of Voltage, Current and Real Power in primary and Secondary Circuits of a Single Phase Transformer panel
6. Load Test on Single Phase Transformer (Calculate Efficiency and Regulation) panel
7. Three Phase Transformer: Verification of Relationship between Voltages and Currents (Star-Delta, Delta-Delta, Delta-star, Star-Star) panel
8. Measurement of Active and Reactive Power in a balanced Three-phase circuit panel
9. Performance Characteristics of a Separately/Self Excited DC Shunt/Compound Motor panel
10. Torque-Speed Characteristics of a Separately/Self Excited DC Shunt/Compound Motor panel
11. Performance Characteristics of a Three-phase Induction Motor panel
12. Torque-Speed Characteristics of a Three-phase Induction Motor panel
13. No-Load Characteristics of a Three-phase Alternator panel

MC109/MC209:PYTHON PROGRAMMING

B.TECH I YEAR II SEMESTER								
COURSE CODE	**CATEGORY**	**HOURS/WEEK**			**CREDITS**	**MAXIMUM MARKS**		
MC109/MC209	**MC**	**L**	**T**	**P**	**C**	**CIA**	**SEE**	**TOTAL**
		2	**0**	**1**	**0**	**30**	**70**	**100**
CONTACT CLASSES:30	**TUTORIAL CLASSES:Nil**	**PRACTICAL CLASSES:15**				**TOTAL CLASSES :45**		

PREREQUISITES: A course on "Python Programming".s

COURSE OBJECTIVE:

At the end of the course students should be able to:

1. To learn how to use lists, tuples, and dictionaries in Pythonprograms.
2. To learn how to write loops and decision statements inPython.
3. To learn how to read and write files in Python.
4. To learn how to use exception handling in Python applications for errorhandling.

COURSE OUTCOME:

At the end of the course students will be able to:

1. Explain basic principles of Python programminglanguage.
2. Create, run and manipulate Python Programs using core data structures like Lists, Tuple, Setand
3. Dictionaries.
4. Understand and summarize different File handlingoperations.
5. Handle exceptions inprogramming.

Unit -1

Algorithms, building blocks of algorithms (statements, state, control flow), notation (pseudo code, flow chart, programming language), algorithmic problem solving, simple strategies for developing algorithms. Python Basics, Features of Python, Python Applications, Installing and running Python with Different IDEs, Comments in Python, Memory Management in Python, Garbage Collection in Python, Python I/O : Printing to the Screen, Reading Keyboard Input.

Unit -2

Operators in Python: Arithmetic, Relational and Comparison Operators, Python Assignment Operators, Logical Operators and Bitwise Operators, Membership Operators, Identity Operators, Operator Precedence and Associativity, Evaluating Expressions. Control Statements: A Word on Indentation, The if Statement, The if … else Statement, The if … elif … else Statement, The while Loop, The for Loop, Infinite Loops, Nested Loops,
Loop manipulation using pass, continue, break and else Statement.

Unit -3

Variables and Data Types in Python**:** How Python Sees Variables, Constants, Identifiers and Reserved words in Python, Naming Conventions in Python. Declaring and using Numeric data types: int, float, complex and boolean , Sequences: Using String data type, Lists and Tuples, Methods and Useful Built-in Functions,
Dictionaries and Set Types

Unit -4

Python Programming using functions, modules and packages: Organizing python codes using functions, Formal and Actual Arguments, Positional Arguments, Keyword Arguments, Default Arguments, Variable Length Arguments, Pass by Object Reference, Local and Global Variables, Scope and Lifetime of variables,

Nested Functions, Recursive Functions, Powerful Lamda function.
Unit -5
Python File Input-Output: Opening and closing file, Various types of file modes, reading and writing to files. Python Exception Handling: Avoiding code break using exception handling , Various keywords to handle exception, try .. except .. else … finally, Raising Exceptions, Assertions, Python Custom Exceptions.
TEXT BOOKS: 1. Learning with Python3: How to Think Like a Computer Scientist, 3rd Edition – Peter Wentworth, Jeffrey Elkner, Allen B. Downey and ChrisMeyers 2. AllenB.Downey,``ThinkPython:HowtoThinkLikeaComputerScientist,,,,,Shroff/O,,Reilly Publishers.
REFERENCE BOOKS: 1.Introduction to Python for Computational Science and Engineering (A beginner's guide), HansFangohr. 2. Exploring Python, Timothy A. Budd, Mc Graw HillEducation 3. JohnVGuttag,—IntroductiontoComputationandProgrammingUsingPython,,,,,Revisedandexpanded Edition, MITPress 4. PYTHON PROGRAMMING, Ashok Kamthane and Amit Ashokkamthane
E TEXT BOOKS: 1. https://www.davekuhlman.org/python_book_01.pdf 2. https://www.pdfdrive.com/python-programming-for-the-absolute-beginner-d34494394.html 3. http://index-of.es/Python/Exploring%20Python.pdf

MC210/MC110: APTITUDE AND REASONING

B.Tech. I Year II Semester								
Course Code	**Category**	**Hours/Week**			**Credits**	**Maximum Marks**		
		L	**T**	**P**	**C**	**CIA**	**SEE**	**Total**
MC210/MC110	**MC**	3	-	-	0	30	70	100
Contact Classes: 45	**Tutorial Classes: Nil**	**Practical Classes: Nil**				**Total Classes: 45**		

Prerequisite: Nil

Course Objectives:

This is a foundation course and aims at enhancing employability skills in students. Students will be introduced to higher order thinking skills and problem solving on the following areas - Arithmetic ability, Numerical ability and General reasoning. Students will be trained to work systematically with speed and accuracy while problem solving.

The major areas covered in this course include

1. ArithmeticAbility
2. NumericalAbility
3. QuantitativeAptitude
4. VerbalReasoning
5. Logicalreasoning
6. VisualReasoning

Course Outcomes: Upon the completion of the course, students are expected to

1. Solve questions on the above mentioned areas using short cuts and smartmethods
2. Understand the fundamentals concepts of Aptitudeskills
3. Perform calculations with Speed &Accuracy
4. To improve Logical thinking.
5. To improve Application Knowledge

Unit-1	**ARITHMETIC ABILITY FOUNDATION**

ARITHMETIC ABILITY FOUNDATION: Square root, Cube roots, Speed Maths using Vedic Maths, Surds & Indices, Logarithms

Number Systems - Types of numbers, Divisibility tests, LCM and HCF, Unit digit, Number of zeroes,

Factorial, No. of factors, Remainder concepts, Successive Divisors

Unit-2	**COMMERCIAL ARITHMETIC& ARITHMETIC ABILITY ADVANCED**

COMMERCIAL ARITHMETIC: Percentages, Profit and Loss, Discount, Simple Interest & Compound Interest

ARITHMETIC ABILITY ADVANCED: Time, Speed & Distance- Basics, Average Speed, Problems on Trains, Relative Speed, Boats & Streams, Races & Games, Circular Motion

Time and work, Work & Wages, Chain Rule, Pipes and Cisterns

Unit-3	**BIODIVERSITY AND BIOTIC RESOURCES**

ALGEBRA: Linear Equations, Quadratic Equations and In-equations, Averages, Ratio, Proportion & Variations, Ages, Partnership

LOGICAL REASONING: Statements & Conclusions, Statements & Course of Actions, Statements &

Assumptions, Cause & Effect, Coded Inequalities, Syllogism, Input Output

Unit-4	**MODERN APTITUDE**

MODERN APTITUDE - I: Permutations & Combinations, Circular Permutation, Probability, Area and Volumes.

MODERN APTITUDE - II: Data Sufficiency, Data Interpretation – Line graph, Pie Charts, Bar graph

Unit-5	VERBAL REASONING & VISUAL REASONING

VERBAL REASONING: Blood relations, Directions, Coding & Decoding, Number Ranking, Venn Diagrams, Alphanumeric Symbol Test, Mathematical operations.
Series, Analogy, Classification, Analytical Reasoning - Information Ordering – Arrangements
VISUAL REASONING: Series, Analogy, Classification, Mirror & Water Images, Spotting out the Embedded figure, Pattern Incompletion, Paper Folding & Cutting, Analytical Figures, Cubes & Dice

Text Books:

1. Quantitative Aptitude for Competitive Examinations – Dr. R.S Aggarwal, S. Chand Publisher, English Medium, Revised & EnlargedEdition.
2. A Modern Approach to Verbal Reasoning (Fully Solved) – Dr R.S Aggarwal, S. Chand Publisher, English Medium.
3. Environmental Studies by R. Rajagopalan, Oxford UniversityPress.

Reference Books:

1. How to Prepare for Quantitative Aptitude for the CAT – Arun Sharma, Publisher: Mcgraw Hill TP, 8th Edition, EnglishMedium.
2. A Modern Approach to Verbal & Non-Verbal Reasoning – Dr. R.S Aggarwal, S. Chand Publisher, English Medium, Revised Edition.
3. Quantitative Aptitude for All Competitive Examinations – Abhijit Guha, Publisher: Mcgraw Hill, 3rd Edition, EnglishMedium.
4. Quantitative Aptitude - For Competitive Examinations – Rao U. M. Karanam, Publisher: Scitech Publications (India) Pvt. Ltd, ISBN: 9788183714631, EnglishMedium.
5. Course in Mental Ability and Quantitative Aptitude - For Competitive Examinations – Edgar Thorpe, Publisher: Tata McGraw - Hill Education, 2nd Edition, EnglishMedium.